



Istanbul New Airport ESIA

Introduction

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1 Introduction

1.1 Project Background

The Turkish aviation sector has experienced significant growth with a compound annual growth rate of 16% over the last 10 years. High levels of growth and demand are expected to continue in the short and medium-terms within Turkey. Due to the increasing congestion at the existing Istanbul airports and the need to expand the airport capacity of the region, the General Directorate of State Airports Authority (DHMI) conceptualised the Istanbul New Airport (INA) Project in 2012 and in January 2013 issued a tender to appoint a concessionaire for 25 years to build, operate and transfer (BOT) a new green field airport (the Project). The tender was conducted on an open auction basis on 3 May 2013. The Consortium, formed by five Turkish companies – CENGİZ, MAPA, LİMAK, KOLİN and KALYON (each with a 20% stake), won the tender for 25 years to operate the new airport from completion of the first phase. After the tender, İGA Havalimanları İşletmesi A.Ş. (IGA) was established by the Consortium for the construction and operation of INA.

The Project involves the design, building and operation of an international airport located on the Black Sea coast 40 km north-west of the City of Istanbul and to the north-west of the existing international airport, Ataturk International Airport, located on the European side of Turkey. In its ultimate phase, the airport will include six runways, passenger terminals and satellites (international and domestic); Air Traffic Control (ATC) Towers; Air Passenger Movement (APM) Station; a cargo terminal; maintenance; cargo apron; hangars; and ancillary buildings; general aviation; a VIP terminal; a fuel farm; fuel delivery jetty; fire services; a metro link; airport service roads and airport connector roads (the Project Area or Site).

The new airport is required to have an opening day capacity of at least 90 million passengers per annum (mppa), with phased expansion over 25 years to accommodate at least 150 mppa by Phase 4. At the opening of Phase 1 of the new airport (planned for 2018), one of the conditions for the concession agreement requires the existing Ataturk International Airport, located on the European side of Istanbul, to be closed to commercial passenger traffic, and limited to cargo, maintenance and general aviation activities. A full Project Description can be found in **Chapter 3 Proposed Project and Project Description** of this Environmental and Social Impact Assessment (ESIA) Report.

This document comprises the ESIA Report for the Project, which assesses and evaluates the environmental and socio-economic impacts of Project-related activities during the earthworks, constructional and operational stages. The Project has previously been subject to the Turkish Environmental Impact Assessment (EIA) process and the EIA Report was prepared by AK-TEL Muhendislik on behalf of the Ministry of Transport, Maritime Affairs and Communications, General Infrastructure Directorate and finalised in May 2013. The EIA received a positive decision from the Turkish Ministry of Environment and Urbanisation (MoEU). This ESIA Report also identifies and estimates the extent and quality of available data within the Turkish EIA Report, establishes uncertainties associated with predictions and specifies topics that require further attention, where relevant.

1.2 Airport Site Overview

1.2.1 Area

The Project Area lies within the Istanbul region of Turkey and is located 35 km north-west of the existing Ataturk International Airport and 40 km from the centre of the City of Istanbul on the Black Sea coast. The topography of the area is uneven with a terrain elevation difference of several tens of meters from one portion of the Site to another. The Site covers an area of approximately 7,650 hectares (ha) that borders the Black Sea coastline and is part of approximately 189,000 ha of private property which is subject to land acquisition by the Turkish government prior to the airport development taking place.

Portions of land within the Project Area are being mined for sand, gravel and lignite which represents approximately 1,180 ha. Sixteen companies are listed as licensed mines, of which six are currently operational. An area of 298 ha is listed as being used for agricultural and stockbreeding purposes (including 236 ha of pasture land, 60 ha of dry farming, 2 ha of scrub). An official area of 5,230 ha has been identified as forestry according to data obtained from the General Directorate of Forestry. An area of 610 ha is comprised of different sized water bodies (70 in total with sizes ranging from 0.17 to 100 ha) resulting from previous quarry excavation (open pit mining) areas, which were then filled by precipitation. The remaining area of approximately 332 ha is made up of the connecting road network and three landfill sites within the boundary of the Project Area (of which two are operational and licensed by the government to receive construction waste materials).

It should be noted that in accordance with the United Nations Framework for Climate Change forest identification, IGA established through site surveys that 4,352 ha is forest area. This area represents the actual area covered by trees and saplings. The official forest area of 5,230 ha mentioned above includes areas that contain trees as well as very sparse or no tree cover. For the purposes of the ESIA, the official figure of 5,230 ha was used.

The area immediately surrounding the Project Area is relatively undeveloped, with a number of small to mid-sized settlements, some mineral extraction activities, forested land and open spaces. The surrounding area has been identified by the Turkish government and the local municipality as a location for other major development projects to complement the Project.

The Project Area falls within the municipalities of Eyup and Arnavutkoy, and it is accessed by the Ihsaniye to Tayakadin Highway running in the southern portion of the Site. The highway links to the Northern Marmara Motorway construction. There are four settlements, referred to as neighbourhoods, in the vicinity of the Project Area: Tayakadin 350 m to the west; Yenikoy 200 m to the north-west; Akpinar 250 m to the east; and the Yukari Agacli potentially located within the Project Area. It should be noted that in recent design changes, the east-west runway length has been shortened to avoid the Yukari Agacli neighbourhood. However, the final decision regarding the status of the neighbourhood has yet to be confirmed by the Turkish government.

1.2.2 Definition of the Airport Project

For the purposes of this ESIA Report, the INA Project encompasses all direct activities to be financed and/or over which it can exert control and influence through its design, impact management and associated mitigation measures. Therefore, this comprised the airport facilities to be located within the proposed airport Project Area and within the Area of Influence (Aol) (as defined below). This covers all phases of the INA Project.

1.2.3 Key Stages of the Project

The Project is planned to be delivered in four phases as outlined below; detailed information including the construction programme is contained in **Chapter 3 Proposed Project and Project Description**.

Phase 1

The development programme for Phase 1 works (including construction) runs between December 2013 and December 2017. Phase 1 is scheduled to span a total of 58 months, for Phase 1a and 1b combined from the date of construction site delivery and will provide an airport capacity of 90 mppa. The Phase 1 development includes:

- A single terminal facility (Terminal 1) with a processing capacity of 90 mppa;
- Three independent north-south runways;
- Supporting taxiway system;
- Air traffic control tower(s);
- Cargo terminal;
- VIP and General Aviation terminals; and
- Other airport support facilities, including car parks, navigational aid buildings, fire rescue buildings, wastewater treatment plant, fuel farm, waste collection facilities, de-icing facilities, combined heat and power (CHP) plant, APM stations; access roads and metro access facilities.

Phase 2

Phase 2 will be delivered within 27 months of completion of the Phase 1 programme. The Phase 2 development includes:

- An east-west runway located in the eastern portion of the Project Area;
- A supporting taxiway;
- Helicopter hangar building and parking;
- Rescue and firefighting service area;
- Medical centre; and
- Additional air traffic control tower

Phase 3

Phase 3 will be delivered within 33 months following a capacity trigger of 80 mppa and will increase airport capacity by a further 30 mppa. The Phase 3 development includes:

- A second terminal to the east of Terminal 1;
- An additional north-south runway;
- Supporting taxiway system;
- Expansion of existing cargo and support facilities; and
- Additional maintenance and support facilities area in the eastern portion of the Project Area.

Phase 4

Phase 4 will be delivered within 33 months of a capacity trigger of 110 mppa and will increase airport capacity by a further 33 mppa. The Phase 4 development includes:

- A satellite concourse located to the north of Terminal 1;
- An additional north-south runway;
- Supporting taxiway system; and
- Expansion of existing cargo and support facilities.

The main scope of works for the Project include the following activities:

- **Pre-Construction:** Land expropriation is being managed by AYDEM and the Housing Development Administration of Turkey (TOKI) to allow the Project to proceed. A large proportion of the Project Area is covered with forest which needs to be removed by Ministry of Forestry and Water to enable the commencement of earthworks for Phase 1 construction. There are approximately 70 water bodies in the Project Area which require dewatering followed by filling to accommodate construction of the runway platforms, airport terminals and support buildings and operations.

Currently, the Project Area has two drinking water pipelines (one is disused) crossing it, along with a power transmission line. These will require relocation before commencement of earthworks at the specific locations which will be affected by the relocation. In addition, the D-010 Ihsaniye to Tayakadin Highway runs from east to west within the southern portion of the Project Area. This will be replaced by the construction of the Northern Marmara Motorway connecting the 3rd Bosphorus crossing with Europe to the north of Turkey;

- **Mobilisation:** Construction camps will be built, which will include worker accommodation (living and eating quarters), offices, car parks, wastewater treatment facilities, waste collection areas, medical centre and visitor accommodation. The facilities will be provided with heating, potable water and electricity. Batching plants, asphalt plants, sub-base mechanical plants will be installed to support construction activities within the construction site. Aggregate will be obtained from quarries and transported to the Site (the location and transport methods have not been confirmed). An equipment and truck parking area will be established along with a refuelling station for on-site equipment. Earthmoving and stationary equipment will be refuelled by mobile tankers;
- **Earthworks and Construction:** As the Project Area currently consists of open cast mining and quarrying activities and forestry lands, the Site will be completely redeveloped including earthworks to provide a platform for the airport up to 92 m above sea level. This will require water bodies to be filled and land to be levelled through a cut and fill exercise throughout the Project Area to establish the required platform levels; and
- **Superstructure Works:** Passenger facilities will be constructed, which include a four-storey passenger terminal building (Terminal 1), the installation of airport systems (including escalators, apron systems, baggage handling and IT systems) and other passenger facilities (including construction of tunnels to incorporate the APM and baggage handling systems). Construction of a tunnel and station to accommodate a metro link and construction of a VIP terminal, Government House and associated aprons will also be undertaken. Following Phase 1, further development is planned and will include a satellite passenger area for Terminal 1 and a second terminal that will be based on the same principles as Terminal 1 but on a smaller scale.

Platform surface preparation and construction will require concrete from on-site batching operations. Aggregate for the development will be sourced from off-site locations that have

not been determined at the time of writing. Airport access roads will be constructed to link the airport with the local highway network and internal transport movements around the airport.

Auxiliary facilities to be constructed during this stage will include a cargo area and airport support facilities including fuel tank farm, fuel delivery jetty, wastewater treatment plant, combined heat and power (CHP) plant, waste collection facilities and de-icing facilities.

Further details of the works are contained within **Chapter 3 Proposed Project and Project Description**.

1.2.4 Definition of the Project Area of Influence

The minimum study area for conducting an ESIA for a Project is defined as the Project Aol, which is generally larger than the Project Area in order to address all possible relevant impacts. In this context, the impact area is the geographic area that may experience impacts to the biological, physical or socio-economic environments from expropriation, earthworks, construction and operation of the Project components. This area will include the lands permanently and temporarily affected by the Project features.

According to International Finance Corporation (IFC) Performance Standard 1:

“...the area of influence encompasses, as appropriate:

The area likely to be affected by i) the project and the client's activities that are directly owned, operated or managed (including by contractors) and that are a component of the project; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.

Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.”

The extent of the Project Aol varies from one topic to another, based on the consideration of all relevant environmental and social resources and potential impact on those resources separately.

Table 3.2.2 in **Chapter 3 Proposed Project and Project Description** summarises the Project Aol for different environmental and social topics. For each topic, different spatial extents have been defined and studied in terms of baseline data collection and impact assessment and are defined within the relevant sections of **Chapter 7 Environmental and Social Baseline and Impact Assessments**. The specification of certain distances for various topics and detailed definitions have been based on the existing environmental and social conditions in the region and relevant study area, the Project description and layout provided in the Master Plan and expected impacts associated with the Project. These factors have been evaluated and considered by the specialists in defining the Aol for each technical area. Thus, knowledge and experience of the specialists involved in the study based on expert judgement and previous experience, findings of the Turkish EIA Report, and stakeholder engagement (as reflected in the Turkish EIA process and in general) have been taken into account.

As with the whole ESIA process, identification of the Project Aol has been an iterative process which has been refined with the progress and the findings of the studies. The Project Aol is defined more fully in **Chapter 3 Proposed Project and Project Description**.

1.3 Associated Facilities

Associated facilities are defined by the IFC as *“facilities that are not funded as part of the project (funding may be provided separately by a client or a third party including the government), and whose viability and existence depend exclusively on the project and whose goods or services are essential for the successful operation of the project.”*

With respect to infrastructure and access, the Project Area is currently surrounded by little development, and is only served by the D-010 Ihsaniye to Tayakadin Highway and other local roads servicing existing developments and facilities in the surrounding area. The Ihsaniye to Tayakadin Highway will be shifted to the south, and expanded into a dual 3-lane highway. An additional main access will be provided via the Northern Marmara Motorway. The General Directorate of Highways (KGM) has plans to put a multi-level interchange on the Northern Marmara Motorway to provide access to the airport. This would also allow the use of the Ihsaniye to Tayakadin Highway access to the airport. The Ihsaniye to Tayakadin Highway would also provide further access points to the future Terminal 2, as well as the eastern and western facilities. The highway connection projects, interchanges and junctions would require collaboration and coordination of the relevant authorities (Turkish General Directorate of State Airports Authority (DHMI) and KGM).

Currently, there are two existing water pipelines passing through the Project Area (with a total length of 38 km), one of which will need to be relocated and the other is inactive so it will be removed. The relocation of the pipeline which is 2,200 mm in diameter and 15 km in length and the transmission line would be undertaken by IGA; this has not been included within the scope of this ESIA Report, and may be subject to a separate EIA. The new location for the Istanbul Waterworks Authority (ISKI) pipeline will be confirmed and excavation will take place to install the pipework and the excavation will be backfilled. The work will be undertaken in conjunction with the ISKI organisation to ensure that there is uninterrupted operation of the Istanbul drinking water supply from Lake Terkos. The new pipeline will be tested and commissioned and, once approved, the existing ISKI inactive pipeline will be dismantled.

In addition, there is one metro line and a high speed rail line planned to support the connectivity and the operation of the Project, which would be under the responsibilities of Istanbul Metropolitan Municipality and General Directorate of Infrastructure Investments (AYGEM, formerly DLH).

Within the airport itself, support areas are required to accommodate a wide range of facilities, many of which are likely to be planned and delivered by third parties (such as cargo, aircraft maintenance and catering facilities). The Project will provide a framework for the structured development of these areas, coordinated with the wider airport development plan, which will be refined over the concession period to suit the demand from third party operators.

A landside plaza is also proposed to provide amenities for all visitors to the airport, which would include several commercial activity clusters and will contain hotels, conference centre, retail, and food and beverage spaces. It is anticipated that these developments will be constructed by third parties.

It is anticipated that there will be other associated facilities and activities to the Project; however, details of these facilities are limited at this stage. Nonetheless, IGA will require any third party organisations providing any associated facilities or activities to follow a set of environment and social rules.

1.4 Purpose of the ESIA

The potential financial lenders for the Project include organisations that apply IFC Performance Standards and/or Equator Principles. Therefore, an ESIA Report is required for the Project to demonstrate that IFC performance standards and Equator Principles, which are underpinned by the IFC standards have been met. An ESIA Report is needed to evaluate the environmental and socio-economic impacts of Project-related activities during the excavation, construction and operational phases of the Project. Therefore, the purpose of this ESIA Report is to determine a baseline (pre-project) environment; assess the significance of potential environment and social impacts; and identify potential significant impacts, and propose mitigation measures that are designed to avoid, minimise or mitigate the identified significant adverse impacts of the Project.

As indicated previously, the ESIA Report also identifies and estimates the extent and quality of available data from the Turkish EIA Report, and uncertainties associated with predictions, and specifies topics that do not require further attention.

The ESIA Report incorporates the following:

- Initial scoping of the assessment process;
- Project description, including identification of the Project Area of Influence;
- Analysis of alternatives;
- Stakeholder identification and gathering of environmental and social data;
- Impact identification, prediction and analysis;
- Development of proposed mitigation and management measures and actions;
- Assessment of the significance of impacts prior to mitigation and the evaluation of residual impacts post-mitigation;
- Assessment of Cumulative Impacts; and
- Framework for environment and social management plans.

In support of the ESIA process, consultation with potential stakeholders has been undertaken, as detailed within a Stakeholder Engagement Plan (SEP) (**Chapter 5 Stakeholder Engagement**), to provide detailed information regarding the Project programme and activities and to receive feedback. The SEP will also provide a framework for how the Project will maintain a process of engagement with stakeholders over the life of the Project.

1.5 Development of the ESIA

As part of the initial preparations and scoping for this ESIA Report, a gap analysis was undertaken of the Turkish EIA Report. Based on the results of this gap analysis, an extensive body of supplemental and detailed studies and reports were designed and have been prepared during the course of the planning and design process.

The key documents include, but are not limited to, the following:

- Istanbul New Airport ESIA Scoping Report (2014);
- Istanbul New Airport Master Plan (2013) (Ref. 1.1);
- Istanbul New Airport Environmental Impact Assessment (2013) (Ref. 1.2);
- Terms of Reference (ToR) (2013) (Ref. 1.3); and
- Istanbul New Airport Master Plan (New Runway Layouts and Drawing (2015)) (Ref. 1.4).

The full complement of studies and reports relied upon within this ESIA Report are referenced in the relevant environmental and social baseline and impact assessment sections contained within **Chapter 7 Environmental and Social Baseline and Impact Assessments**. This ESIA Report has been developed.

1.6 Scope of the ESIA

This ESIA Report has been developed as a comprehensive integrated assessment of the Project, combining compliance within Turkish regulatory requirements with Good International Industry Practice (GIIP) and the requirements of potential lending institutions, including the IFC. The gap analysis of the Turkish EIA provided a baseline for the development of methodologies for the collection of baseline data that has been used to conduct an assessment of the potential significant environmental and social impacts associated with the Project. The impact assessment process has included the identification of mitigation and control measures and has adopted the principles of 'avoid, mitigate and restore' in line with the mitigation hierarchy. Residual impacts have also been assessed and control methods, including monitoring and measurement plans, have been identified for each particular topic area.

A Scoping Report was prepared at the commencement of the ESIA process to set out which environmental and social topics should be included in the assessment. Table 1.1 below sets out a summary based on the potential impacts identified during the scoping stage, as well as details of the scope adopted for the ESIA.

Table 1.1 Potential Impacts and Scope of the ESIA

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
Forestry	Earthworks and Construction	<p>4,352 ha of the Project Area are currently covered with forestry (both natural and artificial). There are trees within the Project Area and large proportion of them will be removed to enable earthworks to be undertaken and construction to start.</p> <p>The General Directorate of Forestry is responsible for cutting and relocating/replanting the forest from the Project Area in accordance with relevant Turkish legislation.</p>	<ul style="list-style-type: none"> • An Afforestation Plan has been prepared to determine: the quality of the forest areas; the potential impacts of the Project on the forest area; and the effect of the measures for the reduction and mitigation of adverse impacts. This includes: <ul style="list-style-type: none"> ○ Definition of the study area. ○ Maps and satellite images (where available) for the study area. ○ Background data and information where available. ○ Maps utilised for the field studies. ○ Supporting information on forest conditions and species in the study area provided by ecological field surveys. ○ An inventory of the forestry for the study area. ○ An evaluation of forest areas to be preserved during earthworks and construction. ○ A review of compensatory habitat areas defined by the Turkish Ministry of Forestry to confirm appropriateness regarding net gain versus net loss. • Where areas have been identified as unsuitable for compensation purposes, new potential areas are proposed.
Noise and Vibration	Earthworks and Construction	Earthworks excavations will result in noise emissions and vibrations as a result of earthworks and vehicle movements, pile drivers, and compacting.	<p>The noise and vibration assessment consisted of the following steps:</p> <ul style="list-style-type: none"> • Review of the Turkish legislation to determine acceptable noise levels during construction and operation. • Determination of sensitive receptors (such as nearby settlements) for baseline noise measurements.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
			<ul style="list-style-type: none"> Background noise measurements undertaken at nearby settlements, which would constitute potential receptors of noise generated during construction and operation. This survey was conducted in accordance with International Organization for Standardization (ISO) 1996-1:2003: "Acoustics -- Description, measurement and assessment of environmental noise -- Part 1: Basic quantities and assessment procedures"; ISO 1996-2:2007: "Acoustics - Description, measurement and assessment of environmental noise -- Part 2: Determination of environmental noise levels"; ISO 1996-2: 1991: "Description and measurement of environmental noise - Part 2: Guide to the acquisition of data pertinent to land use". Preparation of the Environment and Social Management Plan (ESMP) framework to avoid or minimise significant impacts of earthworks and construction activities on sensitive receptors.
	Operation	<p>The most significant sources of noise and vibration from airport operations are during the landing and take-off cycles. Other sources of noise and vibration impact relate to ground operations equipment including aircraft taxiing; operation of ground support vehicles; aircraft auxiliary power units (APUs) and aircraft engine testing activities where maintenance activities take place.</p> <p>Additional noise and vibration sources relate to the movement of vehicles accessing the airport.</p>	<p>The noise and vibration assessment consisted of the following steps:</p> <ul style="list-style-type: none"> Review of international airport standards to determine acceptable noise levels of airport operation. Modelling of aircraft noise based on planned fleet composition, runway configuration and hours of operation using ECAC CEAC Document 29: 2nd Edition: 1997. Report on Standard Method of Computing Noise Contours around Civil Airports. Development of proposed noise mitigation measures for airport operations.
Air Quality	Earthworks and Construction	Fugitive dust emissions created during excavations and earth movements with the exposure and movement of soil can reduce air	The air quality assessment consisted of the following steps:

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
		<p>quality without the application of appropriate mitigation measures, as well as local exhaust emissions from excavation and construction vehicles.</p>	<ul style="list-style-type: none"> • Review of the Turkish legislation and international standards to determine acceptable air quality levels during construction. • Obtaining details of the Project construction material requirements, excavation and fill activities and the quantities, and the construction schedule from the master plan/engineering team. • Determination of sensitive receptors (such as nearby settlements) to make baseline ambient air quality measurements of relevant air quality parameters (PM₁₀, settled dust, SO₂, NO_x, selected Volatile Organic Compounds (VOCs) and trace metals in PM₁₀/dust). All measurements and analyses were conducted using ISO standards and by internationally accredited laboratories. • Installation of PM₁₀ low volume samplers at selected receptor points and 24 hour PM₁₀ measurements conducted. For settled dust, settled dust samplers were used and for SO₂, NO_x and selected VOCs, passive sampling was conducted. • Modelling of air quality with regard to sensitive receptors, using ADMS - airports modelling package. • Preparation of the ESMP framework to avoid or minimise significant impacts of earthworks and construction operations on air quality at sensitive receptors.
	Operation	<p>The main sources of airport air emissions include combustion exhaust from aircraft during take-off and landing. Additional air emissions impacts result from ground service vehicle vapours from fuel storage and handling and emissions from ground handling activities. Combustion air emissions can also occur as a result of the combustion of fuel in electricity</p>	<p>The air quality assessment consisted of the following steps:</p> <ul style="list-style-type: none"> • Review of the Turkish legislation to determine acceptable air quality levels during operation. • Review of International Civil Aviation Organisation (ICAO) airport standards to determine acceptable air quality levels of airport operation.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
		<p>generation and heating (combined heat and power plant, etc.) purposes, and fuel combustion emissions during firefighting training activities.</p>	<ul style="list-style-type: none"> • Obtaining details of the operational characteristics especially number of vehicles and planes to be operational at the airport per unit time of concern from the master plan/engineering team. • Modelling of aircraft operations and aircraft air emissions during the takeoff and landing cycle based on planned fleet composition, runway configuration and hours of operation using AIRMOD/EDMS or ADMS - airports modelling package. • Preparation of the ESMP framework to avoid, minimise and mitigate significant impacts from air quality impacts at sensitive receptors.
<p>Resource Use: Energy and Water Consumption</p>	<p>Earthworks and Construction</p>	<p>It is expected that the earthwork requirements will be delivered through cut and fill activities on site; there is no plan for marine dredging to take place to support earthworks fill requirements. However, there will be a requirement for building materials to be sourced, such as aggregate, concrete and asphalt for airport buildings, facilities and surface treatments, including lime for soil improvement.</p> <p>Construction (Phase 1) will require the availability of 15,500,000 m³ of water for dust suppression activities, concrete batching and wash down activities. In addition, construction personnel will require water for welfare facilities.</p> <p>Fuel will be required for operating construction vehicles, machinery and equipment. Office facilities and worker accommodation will require heating (Liquefied Natural Gas) and</p>	<ul style="list-style-type: none"> • The amount of energy, fuel and water required to support earthworks and construction was identified and potential significant impacts assessed, where information was available. • A Resource Management Plan will be prepared to avoid, minimise and control resource use during earthmoving and construction operations.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
		lighting (electricity) during the whole earthworks and construction period.	
	Operation	<p>The airport will consume significant levels of energy for space heating and cooling, internal and external lighting and the operation of airport support systems such as baggage handling.</p> <p>Water consumption will take the form of passenger welfare requirements both in the terminals and on aircraft and terminal and aircraft cleaning activities.</p>	<ul style="list-style-type: none"> The amount of energy required to support the airport was identified and potential significant impacts have been assessed. The Master Plan, which identifies a combined heat and power (CHP) plant to provide airport energy requirements, has been reviewed. The Master Plan also defines energy efficiency proposals for terminal buildings. Water consumption data from the Master Plan for the airport during operation was reviewed and potential significant impacts identified. The requirement for green certification of the main Terminal Building, as set out in the main contract between IGA and DHMI has been reviewed and implications identified. A Resource Management Plan will be prepared to avoid, minimise and control resource use during airport operations.
Water body dewatering	Earthworks	There are 70 water bodies within the Project Area and these will require de-watering in advance of the earthworks and construction programme commencing. The release of the fresh water from this activity could have an impact on the receiving environment.	<ul style="list-style-type: none"> The selected options for dewatering were identified and evaluated for potential significant environmental impact.
Climate Change and Carbon Management	Earthworks, Construction and Operation	Emissions of greenhouse gases (GHG) from fuel, energy consumption and combustion and storage arrangements.	<p>The climate change/GHG assessment and carbon management consisted of the following steps:</p> <ul style="list-style-type: none"> Review of the Turkish legislation regarding these issues.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
			<ul style="list-style-type: none"> • Review of relevant data regarding construction and operation activities, materials, machinery and equipment. • Development of the GHG assessment based upon the IFC guidance document; • Calculation of GHG emissions using accepted methodologies including; Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, World Resource Institute/World Business Council for Sustainable Development (WRI/WBCSD) GHG Protocol, ISO 14064, IFC Carbon Emissions Estimation Tool, any credible nation specific data available (e.g. TUIK, Ministry of Energy and Natural Resources) on GHG emission conversion factors and Department for the Environment, Food and Rural Affairs (Defra), UK data sources (where only the cost of materials are available or no suitable emissions factor for a specific activity could be sourced). • Implementation of a Tier One approach to carbon accounting, drawing on Tier Two principles where country-specific information is available. • Assessment of Equator Principles III requirements regarding alternatives analysis requirements for GHG emissions. • Assessment of the EU Emissions Trading Scheme with regard to the operations of INA (rather than airlines using INA). <p>The ESMP framework prepared for excavation, construction and operation includes a requirement to publish details regarding GHG emissions (if the data analysis identifies that the INA will emit over 100,000 tonnes of CO₂ equivalent annually).</p>

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
Ecology	Earthworks and Construction	<p>As a new development site, there is the potential for ecological resources on and adjacent to the Site to be impacted as a result of removal of natural habitats during Site clearance, earthworks and construction. Noise and vibration associated with construction activities can also impact species resident in neighbouring areas of the Site.</p> <p>The Project Area is located on a major migration route for birds travelling between Europe and Asia. Adjacent to the Project Area is Lake Terkos, which is an International Bird Protection Area (IBPA).</p> <p>Removal of forestry and dewatering of artificial lakes to facilitate earthworks and construction will result in loss of habitat for ecological resources; such as, birds and aquatic and terrestrial animals. In addition, there is the potential for earthworks, construction and operational activities to impact the marine environment.</p> <p>Lighting arrangements during earthworks and construction can impact ornithological and terrestrial ecological resources.</p>	<ul style="list-style-type: none"> • The objectives of the studies on the ecological environment in the Project Area and the potential impact area referred to as the Area of Influence (Aol) were the identification of the flora and vegetation types, and terrestrial and aquatic fauna (mammals, birds, reptiles, amphibians, fish, invertebrates) within the Aol to serve as a basis for determination of the impacts of the Project on biological and ecological resources and to develop appropriate mitigation where necessary. • The ecology assessment consisted of the following steps: <ul style="list-style-type: none"> ○ Review of pertinent literature and previous works. ○ Field studies carried out in the Project Area. ○ Satellite image interpretation, where available. ○ Communication with the stakeholders in the study area during the field studies. ○ Consultation with the Nature Conservation Administration and related agencies and institutions concerned. • The approach for conducting the baseline studies and surveys for the biological/ecological resources and sensitivities can be summarised as follows: <ul style="list-style-type: none"> ○ Definition of the study area. ○ Collation and review of maps and satellite images (where available) for the study area. ○ Collection of further background data and information (apart from the information available in the EIA Report prepared for the Turkish MoEU). This task also covered a literature survey; the literature survey was not limited to the field study

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
			<p>area, but covered the area necessary to put the field study results into spatial context.</p> <ul style="list-style-type: none"> ○ Collation and review of maps for the field studies. ○ Surveys by appropriately qualified personnel. ○ Preparation of further detailed methods and programmes for field sampling, observations, and recording. ○ Identification of observation and sampling locations based on previous knowledge of the area, expert opinion and available maps, images and information. These were checked and adapted (as necessary) during the field surveys. ○ Establishment of an inventory of species and preparation of maps. The conservation status of the identified species has been defined according to the Bern Convention, IUCN Red List and other relevant categories (e.g. Red List of Turkey) for the evaluation of the species for their importance. ○ Compilation of data from each survey to provide a baseline of information upon which an assessment of potential impacts from Project operations was undertaken.
	Operation	Ecological resources can be impacted by the operations of the airport in terms of noise and vibration disturbance. Birds flying across the take-off and landing areas can be involved in fatal strikes. Mitigation measures can be introduced to avoid this occurrence but there is a subsequent impact on the ecology of the area. Reduced air quality as a result of engine and fuel emissions from aircraft can impact	<ul style="list-style-type: none"> • The baseline survey described above was used to determine potential ecological concerns during operation. • A Biodiversity Action Plan will be prepared to avoid or minimise the negative impacts of airport operations on ecological resources.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
		<p>species both on and in the vicinity of the airport.</p> <p>Lighting arrangements during airport operations can affect ornithological and terrestrial ecological resources.</p>	
Soil and groundwater	Earthworks and Construction	<p>Land contamination may be encountered during construction due to known or unknown historical releases of hazardous materials (such as ready mix products (concrete)) or oil or due to the presence of abandoned infrastructure formerly used to store or handle oils, diesels or other hazardous materials.</p> <p>The Project Area is characterised by landfill operations; reported as construction materials, which may constitute a source of historical contamination.</p>	<p>The geology and soils assessment consisted of the following steps in respect to soil and groundwater:</p> <ul style="list-style-type: none"> • A land condition survey to identify and evaluate the extent and magnitude of environmental liabilities, determining whether there were any Recognised Environmental Conditions (REC) and other Activity of Interests. The work was performed under ASTM Standard E1527-00, as applicable in Turkey. • Soil sampling to confirm or otherwise the existence of a release into the environment at an identified REC/Activity of Interests at levels above applicable national environmental regulations. The objective of the sampling and assessment was to characterise the specific nature and extent of any suspected contamination identified during the land condition survey and provide a more accurate assessment of any potential environmental risk and cost associated with the development site, including general recommendations to mitigate any site contamination risks which have been identified.
	Operation	<p>Airport operations can result in instance of soil and groundwater contamination as a result of incorrect storage and handling of potentially contaminating substances.</p>	<ul style="list-style-type: none"> • A review of the Master Plan was undertaken to confirm potential contaminative sources during operations. • Appropriate storage and handling procedures will be incorporated into detailed design, as set out in the framework for an ESMP.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
Soil erosion	Earthworks and Construction	Exposure of soil surfaces to wind and rain during site clearance, earthmoving and excavation can result in soil erosion. This can also result in sedimentation of surface drainage networks resulting in an impact to water quality.	<ul style="list-style-type: none"> The framework for an ESMP sets out GIIP to manage potential significant impacts associated with soil erosion and sediment runoff from exposed soil.
	Operation	Runoff from exposure soil areas within the airport perimeter.	<ul style="list-style-type: none"> The Master Plan defines landscaping and grading of non-hard-standing/runway/taxiway areas to accepted international standards to include reduction in soil erosion on slope areas.
Stormwater and Wastewater	Earthworks and Construction	<p>During construction, exposed soil can be washed into local water bodies resulting in siltation and increased suspended solids levels. Runoff of stormwater can enter local watercourses resulting in increased turbidity, flow rates leading to increased erosion and potential for flooding in downstream locations. Vehicle wash arrangements and batch and crushing plants can create wastewater.</p> <p>The construction work force will increase the amount of sewage waste created in the Project Area and this will require treatment and disposal in accordance with national legal requirements.</p>	<p>The water resources assessment consisted of the following steps in respect to stormwater and wastewater:</p> <ul style="list-style-type: none"> A water quality assessment to establish a robust description of the baseline conditions in the Project Area and the AoI. The surface water resources in the study area were identified and water quality was determined through on-site measurements, sampling and laboratory analyses. In addition, a literature survey was conducted to gather previous studies and information regarding water availability, use and quality in the region. Sampling and analyses programme to identify the overall water quality in the water resources, their present use (ecological and human use) and sources and their possible future uses. The baseline survey included measurement/ analyses of relevant parameters as required under Turkish legislation that assisted in defining the overall water quality of the water resources. The in-situ sampling and laboratory analyses were conducted in line with the international standard methods in approved laboratories accredited according to ISO 17025 and by the Turkish MoEU. Determine the status of the water resources in the study area and potential impacts of the Project on these

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
			<p>resources (through possible releases, leaks, increased siltation, etc.) were assessed. This was based on the expected/estimated changes in the water quality due to the excavation, construction and operational activities associated with the Project, including relevant mitigation measures to minimise these impacts to acceptable levels.</p> <ul style="list-style-type: none"> • Review of earthworks and construction plans to confirm potential scenarios where the risk of stormwater contamination is introduced and where wastewater will be created. • An ESMP framework was prepared which incorporates GIIP with regard to managing stormwater runoff from earthworks and construction operations. Measures set out in the ESMP include: <ul style="list-style-type: none"> ○ A routine monitoring programme to provide on-going data regarding stormwater quality and potential significant impacts. ○ Vehicle wash facilities, batch and crushing plants to contain wash and wastewater and direct it to appropriate treatment facilities prior to discharge. ○ Construction camps will be provided with wastewater discharge systems that will be appropriately permitted.
	<p>Operation</p>	<p>Stormwater is mainly from runoff from paved surfaces and this may include pollutants associated with leaks and spills of oil, diesel and jet fuels during operation and maintenance activities. Stormwater runoff can also include aircraft de-icing/anti-icing fluids which typically include ethylene or propylene glycol as well as runway and taxiway de-icing/anti-icing fluids typically containing potassium acetate,</p>	<ul style="list-style-type: none"> • Relevant data from the water quality assessment outlined above were used to provide a baseline for identifying the potential significant environmental impacts of stormwater and wastewater created during airport operations. <p>The water resources assessment consisted of the following steps in respect to stormwater and wastewater:</p>

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
		<p>sodium acetate, calcium magnesium acetate or mixtures of urea and water.</p> <p>Sanitary wastewater is created from employees, passengers and from aircraft.</p> <p>Runoff from firefighting activities (both practice and actual responses) can present a risk to storm water systems.</p>	<ul style="list-style-type: none"> ○ Review of the Master Plan to identify potential for significant stormwater and wastewater impacts during airport operation. The Master Plan identifies designated de-icing facilities around the airport which will be constructed to capture aircraft de-icing fluid. The Master Plan also identifies specific facilities for terminal wastewater treatment which will be designed to match projected airport passenger capacities. Sanitary wastewater collected from aircraft will be directed to the airport domestic wastewater treatment system for disposal. ○ The detailed operations Environmental Management Plans (EMPs) will describe approaches for runway stormwater runoff to be directed to appropriate treatment facilities prior to being discharged. This will address runoff from runway de-icing and actual firefighting response activities.
Hazardous Materials Management	Earthworks and Construction	<p>During construction activities, fuels, lubricants and hydraulic oils are introduced to the Project area to facilitate vehicle re-fuelling, maintenance and power generation. Incorrect storage and handling practices can result in pollution of soil, groundwater and surface water (including the sea) through uncontrolled releases. Additionally, it is possible that some areas of the Site will have contaminated soil.</p>	<ul style="list-style-type: none"> • A list of hazardous materials was reviewed for the earthworks and construction phase. Potential environmental and health and safety impacts were evaluated. • The ESMP framework defines approaches for storage and handling of hazardous materials and handling contaminated soils. • A detailed Resource Management Plan will define designated areas for design and storage of hazardous materials (such as concrete) being used on the Project during earthworks and construction programmes.
	Operation	<p>Airport operations will include handling and storage of fuels (jet fuels, diesel and gasoline) for both aircraft fuelling and ground handling activities. Fuels can be stored in above and</p>	<ul style="list-style-type: none"> • A list of hazardous materials was reviewed for airport operations. Potential environmental and health and safety impacts were evaluated.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
		<p>below ground tanks and conveyed to dispensing locations via above or underground pipes that may be subject to accidental leaks. Use of liquid combustible materials and fire suppression foams and powders for firefighting drills also may result in releases to soil and surface water.</p>	<ul style="list-style-type: none"> A Resource Management Plan will be developed to define designated areas for design and storage of hazardous materials being used on the Project during airport operations. The Resource Management Plan will aim to avoid, minimise and control potential environmental and health and safety impacts associated with the use of materials.
Waste Management	Earthworks and Construction	<p>During construction, various wastes will be produced, including, waste construction materials; waste excavation materials (that are unsuitable for use as fill material); scrap wood and metals; waste oils and chemicals from maintenance and re-fuelling activities; waste tyres; redundant vehicle and machinery batteries; food waste from project site catering facilities; general household waste from site office and construction camp operations. All wastes will need to be segregated and recycled/disposed in accordance with national legislative requirements.</p>	<ul style="list-style-type: none"> A review of the construction programme and works (as set out in Chapter 3 Proposed Project and Project Description) was undertaken to confirm the types of wastes that will be created during earthworks and construction phase. As set out in the framework ESMP, waste segregation is promoted (in accordance with Turkish legal requirements and to promote the waste hierarchy). A Waste Management Plan will be developed to control the creation, collection, storage and disposal of wastes to ensure legal compliance and that the waste management hierarchy is applied. The Waste Management Plan will also define designated waste collection areas being used on the Project during earthworks and construction phase.
	Operation	<p>The airport will generate solid, non-hazardous, food waste from catering facilities, packaging materials from retail facilities and paper, newspaper and a variety of disposal food containers from offices and common passenger areas.</p> <p>Waste will also be received from arriving aircraft and may contain food waste, disposable food containers and paper/newspaper materials.</p>	<ul style="list-style-type: none"> A review of the Master Plan was undertaken to confirm the types of wastes that will be created during airport operations. Waste segregation is promoted (in accordance with Turkish legal requirements and to promote the waste hierarchy). A Waste Management Plan will be developed to define designated waste collection and recycling/recovery areas on the Project during airport operations. It will identify measures to control the creation, collection, storage and disposal of airport wastes to ensure legal

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
		<p>Airport maintenance activities will create waste in the form of waste oils and lubricants, redundant tyres and vehicle/ equipment batteries.</p> <p>Airport operations will generate liquid and solid hazardous wastes, such as, used lubricating oils, solvents, and oily rags from aircraft and ground service vehicle maintenance.</p>	<p>compliance and that the waste management hierarchy is applied.</p>
Cultural Heritage	Earthworks and Construction	<p>There is a potential for artifacts associated with cultural heritage to be found during earthworks and construction activities.</p>	<ul style="list-style-type: none"> The EIA identified that there are no registered cultural heritage sites within the Project Area and this was confirmed by the Ministry of Culture and Tourism. Therefore, there is no requirement for further surveys at this time. A Cultural Heritage Plan, which sets out a Chance Find Procedure, will be prepared and implemented to address possible “finds” during earthworks and construction
Landscape and Visual Impact (LVIA)	Earthworks and Construction	<p>Earth moving and construction activities can impact local amenity and have a visual impact. Site clearance and earthworks will impact on the existing visual amenity of the area. Neighbouring communities will be impacted by this change. During construction, light sources are required to facilitate night working, security and health and safety. These lighting arrangements can have a negative impact on the local community.</p>	<ul style="list-style-type: none"> The LVIA was prepared primarily in accordance with international requirements as well as the Guidelines for Landscape and Visual Impact Assessment (GLVIA) – Third Edition - Landscape Institute and Institute of Environmental Management and Assessment, 2013. <p>The LVIA consisted of the following steps:</p> <ul style="list-style-type: none"> Production of an analysis drawing which identified key landscape and visual considerations and constraint and made suggestions regarding possible design responses and mitigation measures in order to minimise significant effects. This was based on initial baseline appraisal and identification of potential impact generators.. Consideration of baseline conditions after dark as a basis for the assessment of potential lighting impacts on neighbouring receptor locations.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
			<ul style="list-style-type: none"> • The assessment of residual effects, addressing the phased development of the Site, as a result of: <ul style="list-style-type: none"> ○ direct impacts in landscape fabric within the Project Area; ○ impacts on landscape and seascape character within the study area; ○ impacts on areas designated or classified on the basis of their landscape value; ○ visual impacts on key tourist and recreational receptors locations and transportation routes, including those off-shore; and ○ visual impacts on residential receptors and residents of settlements. • Viewpoints, which represent a range of sensitive receptors within the study area were identified in order to verify potential impacts. Where off-site elements were anticipated (e.g. road improvements or temporary accommodation works), the location concerned was included in the assessment.
	Operation	The existence of a six runway airport and associated support activities will impact local amenity and have a visual impact. During operation, light sources are required to facilitate night time airport operations and security and these lighting arrangements can have a negative impact on the local community.	<ul style="list-style-type: none"> • As above.
Traffic and Transport	Earthworks and Construction	Once the Project Area becomes a construction site, roads providing access to Akpinar and sections of the Project Area will be closed. Much of this will impact mineral and landfill operations traffic, but these activities will cease	<p>The Traffic and Transport assessment consisted of the following steps:</p> <ul style="list-style-type: none"> • A manual traffic survey was undertaken at three locations: two locations on the Ihsaniye to Tayakadin Highway and a third location on the Ihsaniye to Akpinar

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
		<p>within the Project Area once the land is handed over to IGA.</p> <p>Construction will introduce traffic to and from the Project Area in the form of worker movements, excavation and earthworks vehicle movements and transfer of materials to and from the site.</p>	<p>road to confirm a baseline of traffic data within the Project Aol.</p> <ul style="list-style-type: none"> • A review of existing, published traffic data obtained from the General Directorate of Highways for the Ihsaniye to Tayakadin Highway that currently passes through the Project Area. • Evaluation of data against the projected vehicle numbers for earthworks and construction activities. • Identification of the potential for significant environmental impacts and likely effects. • Measures to control potential traffic and transport impacts during the earthworks and construction phase have been set out in the ESMP.
	Operation	The airport will introduce a number of passengers travelling to and from the airport to meet flights, this may increase the number of vehicle movements on the access roads around the airport contributing to congestion at peak times.	<ul style="list-style-type: none"> • The Master Plan has estimated the levels of transport associated with the operational airport. This is a multi-modal approach and defines different scenarios based on assumptions regarding typical mode of transport. Transport links are defined within the Master Plan and a Traffic and Transport Management Plan will be prepared by IGA to manage peak flows.
Relocation of Water and Power Transmission Lines	Pre-earthworks	The operational ISKI pipeline and power transmission line currently running west-east across the Project Area are required to be relocated to the south of the Project Area. This will be undertaken prior to earthworks commencing and is expected to be incorporated into the construction of the Northern Marmara Motorway corridor to the south of the Project Area.	<ul style="list-style-type: none"> • Relocation of ISKI line is the responsibility of IGA. Relocation of this line does not require an EIA and has not been considered further within the ESIA. The need for an EIA in respect to the relocation of power transmission lines will be determined separately and will be the responsibility of the relevant authority.
Socio-Economics	Earthworks, Construction and Operation	By their nature, large scale development projects have the potential to have social impacts.	<ul style="list-style-type: none"> • A social baseline survey (including identification of stakeholders and means of engagement) has been undertaken in order to understand the socio-economic

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
			<p>and cultural baseline in the vicinity of the Project Area, as well as to identify issues of concern for the local community. The baseline provided a basis for assessing the social impacts of Project excavation, construction and operation and the development of appropriate mitigation measures.</p> <ul style="list-style-type: none"> ○ Primary and secondary data collection tools were utilised, which include field surveys (key informant) and desktop studies (data collected by Turkish Statistical Institute and pertinent literature). • Based on the details of the Project features and activities (obtained from technical and engineering studies for the Project) and the baseline conditions (determined from the baseline studies), stakeholders were identified and an engagement strategy has been developed. In addition, the social impacts of the Project on the Area of Influence and in a more general regional/national context were assessed. Relevant mitigation and management measures associated with respect for human rights; labour and health and safety programmes; employment policies as well as monitoring activities (including a framework for grievance) were developed and incorporated into the ESIA.
Resettlement	Pre-earthworks	There are six operational mines within the Project Area and a total of 16 issued licences; forestry and farming activities along with a single settlement (Yukari Agacli) located in the south-east of the Project Area. Additionally, there are three further settlements located within 500 m of the boundary of the Project Area: Tayakadin; Yenikoy and Akpinar. There are mineral operations located adjacent to the northern boundary of the Project Area.	<ul style="list-style-type: none"> • A social impact assessment was undertaken to determine impacts on the local community and economy associated with the Project excavation, construction and operation (see socio-economic section above). This included the identification of potentially affected people and an evaluation of the expropriation process. A SEP has been prepared that defines stakeholder engagement throughout earthworks, construction and operation.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
		The Turkish government is responsible for land expropriation.	
Construction Camps	Earthworks and Construction	It is estimated that there will be an average of 12,000 employees at the peak on the construction site. Workers will be accommodated within construction camps located in the Project Area. Workers will be sourced from Turkey and other countries depending on the available skill sets. This influx of people has the potential to impact the local community.	<ul style="list-style-type: none"> • Evaluation of the plans for construction camps to confirm that they are developed in accordance with IFC Guidance for Construction Camps. Potential impacts associated with the influx of people to the camps were evaluated. • The ESMP framework provides minimisation, mitigation and control measures for managing the construction camps facilities and to ensure that workers understand their responsibilities.
Security	Earthworks and Construction	The Project Area will be subject to security to restrict access to key parts of the Site at key times. It is intended that security personnel will be appointed to conduct checks and ensure security is maintained at the Site. Risks can arise from intentional or inadvertent trespassing.	<ul style="list-style-type: none"> • The management of security personnel will include pre-checking of the credentials of the company and the individuals and the requirement to maintain a professional approach that safeguards rather than introduces risk to the local population and workforce.
	Operation	The airport will be subject to strict international security requirements with restricted access.	<ul style="list-style-type: none"> • Approved security organisations will be appointed to maintain airport security.
Noise	Earthworks and Construction	Operation of noisy machinery and vehicles and blasting activities during earthworks can be a source for impacts on workers' health.	<ul style="list-style-type: none"> • The noise assessment included the identification and evaluation of noise levels above national regulatory requirements. • Noise levels during the earthworks and construction phase will be monitored regularly at the nearby settlements and other sensitive receptors, as set out in the framework ESMP. Noise avoidance measures will be adopted in equipment choice; personnel will be restricted from noisy areas; and, where restriction is not possible, personnel protective equipment will be introduced.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
	Operation	<p>The impact of aircraft noise on employees and contractors at the airport will need to be managed.</p> <p>Operation of noisy equipment can impact employees and contractors</p>	<ul style="list-style-type: none"> The noise assessment included the identification and evaluation of noise levels above national regulatory requirements. As set out in the framework ESMP, noise avoidance measures will be adopted in equipment choice; noisy areas will be designated; personnel will be restricted from noisy areas; and, where restriction is not possible, personnel protective equipment will be introduced.
Dust	Earthworks and Construction	Inhalation of dust from earthmoving, construction vehicle movement and fugitive emissions can impact workers health.	<ul style="list-style-type: none"> Air sampling provided a baseline for air quality and an assessment was made of sensitive receptors. Significant impacts of poor air quality were identified and As set out in the framework ESMP, appropriate management approaches, such as, damping down; hours of working; and issuing respiratory protection equipment have been identified.
Physical Hazards	Earthworks and Construction	<p>These can take the form of over exertion, heat or cold stress, ergonomic injuries and illnesses associated with repetitive motion, over exertion and manual handling. Slips and falls on the same levels can occur as a result of poor housekeeping and unevenly prepared surfaces. Falls from height can be associated with working on elevated structures, ladders and scaffolding, work equipment and vehicles.</p> <p>Strikes by objects during earthmoving and construction activities can result in injury. These can be falling objects, ejection of materials from machinery and movement of vehicles and machinery. Heavy equipment operators have limited fields of view close to</p>	<ul style="list-style-type: none"> The potential physical hazards during the construction programme were identified. In each case the potential for significant impact exists. A Health and Safety Management Plan will be prepared by the operator, and risk assessments will form part of this approach and will confirm the actual risk associated with specific activities being undertaken during construction.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
	Operation	<p>the equipment and therefore pedestrians are at high risk when working near such equipment.</p> <p>These can take the form of ergonomic injuries and illnesses associated with repetitive motion, over exertion and manual handling, and heat or cold stress. Slips and falls on the same levels can occur as a result of poor housekeeping and unevenly prepared surfaces. Falls from height can be associated with working on elevated structures, ladders and scaffolding, work equipment and vehicles.</p> <p>Health and safety impacts are associated with strikes by objects, ejection of materials from machinery and movement of vehicles and machinery around the airport. Restricted head room can result in striking injuries. Health impacts associated with working in confined spaces on aircraft or within areas of the airport infrastructure must be managed.</p>	<ul style="list-style-type: none"> • The potential physical hazards during operations were identified. In each case the potential for significant impact exists. • A Health and Safety Management Plan will be prepared by the operator and risk assessments will form part of this approach and will confirm the actual risk associated with specific activities being undertaken during construction.
Chemical Hazards	Earthworks and Construction	Chemicals, fuels and hazardous substances used on construction sites pose a risk to health and safety through inhalation, contact or ingestion if not correctly stored and handled.	<ul style="list-style-type: none"> • A list of hazardous materials was reviewed for the earthworks and construction period. Potential health and safety impacts were evaluated. • A Resource Management Plan will be developed to define designated areas for design and storage of hazardous materials being used on the Project during earthworks and construction programmes. • A Health and Safety Management Plan will be prepared by the operator and risk assessments will form part of this approach and will confirm the actual risk associated with specific activities being undertaken during construction.

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
			<ul style="list-style-type: none"> The ESMP defines approaches for storage and handling of hazardous materials.
	Operation	Chemicals, fuels, de-icing and hazardous substances used on airport can pose a risk to health and safety through, inhalation, contact or ingestion if not correctly stored and handled.	<ul style="list-style-type: none"> A list of hazardous materials was reviewed for airport operations. Potential health and safety impacts were evaluated. A Resource Management Plan will be developed to define designated areas for design and storage of hazardous materials being used on the Project during airport operations. A Health and Safety Management Plan will be prepared by the operator and risk assessments will form part of this approach and will confirm the actual risk associated with specific activities being undertaken during construction.
Traffic Accidents	Earthworks, Construction and Operation	Increased vehicle movements can lead to an increase in road traffic accidents.	<ul style="list-style-type: none"> The potential for road traffic accidents, as a result of increased flows, has been evaluated.
Explosive Atmospheres and Flammable Materials	Earthworks and Construction	Fuel storage and dispensing on construction sites present a range of health and safety hazards and potential impacts.	<ul style="list-style-type: none"> A review of the construction programme has been undertaken to identify activities that create explosive atmospheres or incorporate flammable materials supply, storage and dispensing activities. The potential for explosive atmospheres was then evaluated. The appropriate risk assessments will be undertaken to confirm compliance with national legal requirements and management approaches will be incorporated into the Health and Safety Management Plan to be prepared by IGA/ EPC Contractor.
	Operation	Fuel storage and dispensing on airports present a range of health and safety hazards and potential impacts.	<ul style="list-style-type: none"> A review of the Master Plan and proposed operational activities has been undertaken to identify activities that create explosive atmospheres or incorporate flammable

Topic	Source of Impact	Preliminary Assessment	ESIA Scope
			<p>materials supply, storage and dispensing activities. The potential for explosive atmospheres was then evaluated.</p> <ul style="list-style-type: none"> The appropriate risk assessments will be undertaken to confirm to national legal requirements and management approaches will be incorporated into the Health and Safety Management Plan to be prepared by the operator.
Air Traffic Accident	Operation	Air traffic accidents are a relatively rare occurrence. If one does occur at the airport then the environment and social impacts could be significant.	<ul style="list-style-type: none"> Potential environmental and social impacts associated with an air traffic accident have been assessed (using data collected during other surveys as defined above). IGA will prepare emergency plans for responding to such emergency scenarios.

1.7 ESIA Structure

The ESIA Report has been prepared to provide an integrated assessment of the Project across all relevant social and environmental media and across all phases of the Project.

This ESIA Report comprises two volumes:

- Volume 1 Non-Technical Summary (NTS); and
- Volume 2 ESIA Main Report.

Volume 1 NTS provides a non-technical summary of the Project, its key features, potential environmental and social impacts, and sets out how the Project proposes to manage those impacts to an acceptable level. It describes public consultation and disclosure undertaken by the Project, and provides key contacts for further information.

Volume 2 ESIA Main Report is structured under eight chapters as follows:

- **Chapter 1 Introduction:** including background information relating to the project, the organisation of the ESIA Report, as well as the description of the Project Area and regional context;
- **Chapter 2 Policy, Legislative and Regulatory Framework:** including the relevant laws and regulations, details international finance and airport operating standards;
- **Chapter 3 Proposed Project and Project Description:** including the need for the airport, a description of the airport facilities to be provided and the construction and operational phases of the Project;
- **Chapter 4 Analysis of Alternatives:** including development scenarios and design alternatives;
- **Chapter 5 Stakeholder Engagement:** including a summary of preliminary and main consultations, ongoing consultations and future activities;
- **Chapter 6 Impact Assessment Methodology;**
- **Chapter 7 Environmental and Social Baseline and Impact Assessments** of the following:
 - 7.1 Meteorological Conditions and Climate Change;
 - 7.2 Air Quality;
 - 7.3 Noise;
 - 7.4 Geology and Soils;
 - 7.5 Water Resources;
 - 7.6 Forestry;
 - 7.7 Waste Management;
 - 7.8 Ecology;
 - 7.9 Natural Hazards;
 - 7.10 Resource Efficiency;
 - 7.11 Traffic and Transport;
 - 7.12 Landscape and Visual Impact;
 - 7.13 Social and Cultural Assessment; and
 - 7.14 Cumulative Impact Assessment.

- **Chapter 8 Framework Environmental and Social Management Plan** sets out a framework to explain how environmental and social commitments have been captured from the ESIA to ensure that the Project is constructed and operated in accordance with relevant regulatory and legislative requirements, international guidance and GIIP.

References

Ref. 1.1	Istanbul New Airport Master Plan, Ove Arup and Partners, December 2013
Ref. 1.2	New Istanbul Airport, Environmental Impact Assessment, Ak-tel Engineering Co., October 2013
Ref. 1.3	The Construction Contract Concerning the Construction of the New Istanbul Airport within the Framework F Build-Operate-Transfer-Model, Devlet Hava Meydanlari Isletmesi Genel Mudurlugu, 2013
Ref. 1.4	Istanbul New Airport Master Plan, Ove Arup and Partners, December 2013 as amended in March 2015 (new runway layouts and drawing)