2. LEGAL FRAMEWORK & ENVIRONMENTAL PROTECTION CRITERIA

2.1 INTRODUCTION

2.1.1 The Qatalum Project will be subject to the laws of the State of Qatar and the various international/regional protocols and agreements to which the State is a party. It has been assumed that the financial institution(s) that are likely to be associated with the Project will have adopted the "Equator Principles", thus, the EIA process must also satisfy the Equator Principles.

2.1.2 This Chapter of the EIA report provides:

- a description of the applicable national and local policies and an overview of the regulatory system in Qatar;
- a summary of some of the key international conventions to which Qatar is a party;
- an overview of the Equator Principles;
- Hydro/QP Company Requirements; and
- an introduction to environmental criteria/guidelines/standards.

2.1.3 The relevant guidelines and standards, summarised in this Chapter, are used as a basis for evaluating the environmental impact of the Qatalum Project in subsequent sections of this report.

2.2 NATIONAL POLICY AND REGULATION

Regulatory Bodies

2.2.1 The principal environmental institution is the SCENR; this authority, established under Law No. 11 (2000), was previously known as the Environment Department, which was part of the Ministry of Municipal Affairs and Agriculture (MMAA). The MMAA, established as a result of Law No. 13 (1994), replaced the Environmental Protection Committee, which was established as per Law No 4 (1981). SCENR is responsible for environmental protection and conservation of endangered species and protection of their habitats. This is achieved, in part, through the implementation and enforcement of environmental policies, which are developed in consultation with the Administrative Authorities.

2.2.2 In addition to SCENR, a number of individual city authorities have also been set up in Qatar. The MIC Authority was established in 1996, by Qatar Petroleum, as a single point authority for all facilities in the Mesaieed Industrial Area. As part of this role, the MIC Authority has the responsibility for the allocation of land and the provision of common facilities wherever feasible.

Legislation

2.2.3 Through SCENR, the State of Qatar enforces a number of national environmental laws, regulations and standards; those of relevance to the Qatalum Project include:

- Law by Decree No. 30 of the Year 2002 Promulgating the Environmental Protection Law (2003)[3];
- April 17, 2005 Executive By-Law for the Environmental Protection Law No. 11 of 2000 and Law No. 30 of 2002[4];
- Decision of Council Members of the Year 1998 establishing a permanent Emergency Committee; and
- Law creating the permanent Committee for the Protection of the Marine Environment (1981).

2.2.4 Of these, Law No. 30[3] and the By-Law[4] are particularly relevant to this Project. Law No. 30. outlines the basis of the current environmental protection policy in Qatar, and in particular:

- contains objectives for environmental protection and sustainable development;
- states that undertaking and EIA is essential for development projects;
- states that new projects should use, "a technology available and economically feasible to control the pollution and prevent the environmental deterioration";
- requires agreement of a contingency plan for environmental disasters;
- details proposals for hazardous waste disposal/treatment;
- presents restrictions on activities and environmental practices; and
- details a penalty system for enforcement of the law.

2.2.5 The Executive By-Law also sets out requirements and expectations in respect of environmental management and waste management as conditions for a "Consent to Construct", or "Consent to Operate". Under this By-Law, industries should develop own environmental monitoring programmes for atmospheric, aqueous and solid waste discharges. The plan should specify the frequency and format of the resultant reporting and needs to be approved by SCENR.

2.2.6 Currently the Executive By-Law is available in Arabic; however, only a draft English translation has been made available to industry in the State of Qatar. The English version has been used to define the environmental criteria / standards for use in the EIA.

2.2.7 In addition to the recent Environmental Executive By-Law, MIC Environmental Guidelines and Environmental Protection Criteria have been established for industries operating within the Mesaieed Industrial Area. The MIC Guidelines are in the process of being updated; however a draft version of the update[9], referred to in the Qatalum land lease agreement with the MIC Authority, was made available to the Qatalum Project in September 2005. The most relevant Guidelines / Criteria have been included in this Chapter of the EIA, although it should be noted that until a formal, approved revision of the MIC Guidelines is produced, these can only be considered as draft. The MIC guideline criteria are not statutory requirements in terms of regulation by SCENR; however, they form part of land lease agreements between MIC and Project Proponents and as such are mandatory.

2.2.8 The 1981 law creating the Committee for the Protection of the Marine Environment empowers SCENR to:

- demand an EIA for new facilities and review and approve the EIA prior to authorisation;
- authorise new activities and provides the right to revoke such authorisations;
- enforce regulations by entering premises of regulated facilities and taking samples;
- impose fines for contravention of regulations; and
- follow-up on pollution incidents.

2.2.9 The Qatalum Project is committed to respecting all relevant legislation. The above listings of national environmental laws / statutory requirements may not be exhaustive; however, they are considered to be those that are most relevant in relation to undertaking the EIA for the Qatalum Project.

Environmental Impact Assessment

EIA Procedures

2.2.10 The State of Qatar complies with the principles of the United Nations (UN) Conference on the Environment and Development and Agenda 21 (1992), to institutionalise EIA for all new industry projects and it requires that activities and industries with potentially polluting impacts gain clearance prior to initiation of construction/commencement of new projects (Law No. 30[3] of 2002). The submission and approval of an EIA is the method for obtaining clearance. The “clearance” procedure is outlined in the Policy and Procedures for Environmental Impact Assessment (1997)[5] and the recent Executive By-Law[4]; a basic summary of the process is presented below:

- the project proponents submit an application for Initial Environmental Authorisation (IEA);
- the IEA is assessed by SCENR, who decide whether an EIA is required or not;
- if required, the project proponents provide a scoping report of the intended EIA for comment and approval;
- when the scope has been approved by SCENR, the project proponents undertake and submit the EIA for review;

- the EIA is then either rejected or cleared with conditions; and
- when clearance is granted the project proponents may proceed with the development.

2.2.11 Once an Environmental Authorisation has been granted (i.e. after an EIA has been approved) then construction phase may commence, as specified in the terms of the Permit. Prior to commissioning of the new plant, it is necessary to inform SCENR and apply for a 'permit to operate' 60 days prior to planned start-up.

2.2.12 The MIC Authority's role in the EIA process is primarily that of a facilitator and reviewer, as well as providing coordination with SCENR.

EIA Study Requirements

2.2.13 Articles 15 and 16 of the recent Executive By-Law[4] list the required scope of an EIA study. Article 15 states that the environmental impact study of a project should include the following (depending on the nature of the project):

- comprehensive and accurate description of the project;
- the socio-economic considerations/feasibility of the project;
- the objectives and goals of the project;
- the phases of the project;
- general project impacts and detailed impacts on natural resources and safety;
- the proposed avoidance and mitigation measures for protection of the environment;
- the proposed project emission minimisation and waste management programs; and
- comprehensive description and analyses, by project phases, of the environmental impacts of the project.

2.2.14 Article (16) requires that the description and analysis of the project environmental impacts include the following:

- projected impacts to human health in nearby residential areas;
- projected impacts to ecological systems in the locality of the project;
- projected impacts on any historical, archaeological, aesthetic, scientific, cultural, recreational, or social value site, place or building;
- projected impacts to fauna and flora;
- projected long-term impact on the environment;
- projected changes in the environmental quality or characteristics of the region;
- projected deterioration in the environmental characteristics;
- projected environmental emission/discharge sources;
- identification of any threats to the public health and environmental safety;
- identification of any decreases in the useful utilisation of the environment;
- identification of any waste disposal environmental impacts;
- potential depletion of natural resources and other unique resources; and

- documentation of cumulative environmental impacts from this and other local projects.

Environmental Regulation

2.2.15 The environmental regulation of specific industrial operations is enforced by the SCENR through the consenting system. The 'consent to operate', mentioned above, specifies source-specific standards (based on the recent Environmental Executive By-Law[4]) and other conditions with which a company must comply. To ensure that compliance is uniform and effective, industrial city authorities (e.g. MIC) are utilised as a focal point for industries and activities operating within their areas.

2.3 INTERNATIONAL CONVENTIONS/AGREEMENT

2.3.1 To comply with SCENR's requirements, industries must not contravene the conditions of any international or regional convention to which Qatar is a signatory. The State of Qatar is party to a number of international conventions. One of the key conventions is the *Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution,* 1978 (hereafter referred to as the Kuwait Convention); this provided the framework on which the majority of the State of Qatar's environmental control is based. The Kuwait Convention established the Regional Organisation for the Protection of the Marine Environment (ROPME), which establishes three protocols for protecting the marine environment, one of which is of particular relevance to this Project:

- Protocol for the Protection of the Marine Environment against Pollution from Land-Based Sources.

2.3.2 The remainder of the International conventions/agreements to which Qatar is a signatory are not discussed exhaustively in this report; however, those of most relevance to this Project are listed below. Those of particular significance are discussed further in Section 2.7.

- 1954 International Convention for Prevention of Pollution of the Sea by Oil;
- 1960 International Convention for Safety of Life at Sea;
- 1973 International Convention for Prevention of Accidents at Sea;
- 1978 Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution;
- 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal;
- 1991 The Arab Declaration on Environment and Development;
- 1992 Agenda 21 and the Rio Declaration on Environment and Development;
- 1992 Protocol to the International Convention on Civil Liability for Oil Pollution Damage, ratified by the State of Qatar in Decree No. 33 of 1993;
- 1993 Convention on Biological Diversity (Rio de Janeiro);
- 1996 UN Framework Convention on Climatic Change;
- 1996 Montreal Protocol and its Amendments and the UN Framework Convention on Climate Change;

- 1997 Kyoto Protocol;
- 1999 International Agreement to Combat Desertification in Countries Suffering from Bad Drought or Desertification, particularly in Africa; and
- 2001 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), accessed by the State of Qatar on 8th May 2001 which became a Party to CITES on 6th August 2001.

2.3.3 In addition to the above, Qatar is also a contracting party to the World Heritage Convention and to the Action Plan for the Protection and Development of the Marine Environment and Coastal Areas.

2.4 THE EQUATOR PRINCIPLES

2.4.1 The Equator Principles have been adopted by a number of leading financial institutions worldwide. They have been developed to promote sound environmental management practices and social responsibility. Under the Equator Principles, projects are screened and categorised in terms of environmental risk; depending on the type, location, sensitivity and scale of the project and the nature and magnitude of the project's potential environmental and social impacts. A summary of the Equator Principle Categories is presented below:

- Category A: projects that are likely to result in significant adverse environmental impacts that are sensitive, diverse or unprecedented;
- Category B: projects with potential environmental impacts that are less adverse than Category A projects; or
- Category C: projects that are likely to have minimal, or no, environmental impacts.

2.4.2 It has been assumed that this Project would be a Category A project, and thus will require a full environmental impact assessment. To qualify for funding from "Equator banks" the EIA report must address the following environmental and social issues (as applicable):

- baseline environmental & social conditions;
- requirements of host country laws and regulations, applicable international treaties and agreements;
- sustainable development and use of renewable resources;
- protection of human health, cultural properties, and biodiversity, including endangered species and sensitive ecosystems;
- use of dangerous substances;
- major hazards;
- occupational health and safety;
- fire prevention and life safety;
- socio-economic impacts;
- land acquisition and land use;
- involuntary re-settlement;
- impacts on indigenous peoples and communities;

- cumulative impacts of existing projects, proposed project and anticipated future projects;
- participation of effected parties in the design, review and implementation of the project;
- consideration of environmentally and socially preferable alternatives;
- efficient production, delivery and use of energy; and
- pollution, prevention and waste minimisation, pollution controls (liquid effluents and air emissions) and solid and chemical waste management.

2.4.3 For each of the above, the environmental assessment must:

- address compliance with host country laws, regulations and permits;
- make reference to the minimum standards applicable under the World Bank (WB) Pollution Prevention and Abatement Guidelines[6] and applicable IFC safeguard policies; and
- justify compliance with, or deviations from, the above guidelines.

2.4.4 For Category A projects, an Environmental Management Plan (EMP) should be prepared, based on the findings of the EIA, to address mitigation, action plans, monitoring management of risks and schedules. In additional, structured and culturally appropriate consultation should be held with affected groups (e.g. indigenous peoples and local NGOs).

2.4.5 The International Finance Corporation Environment and Social Development Department has prepared a series of guidelines to inform the private sector in addressing the social dimensions of private sector projects. These include:

- Handbook for Preparing a Resettlement Plan (December 2003);
- Good Practice Note on Addressing the Social Dimensions of Private Sector Projects (December 2003); and
- Social Analysis Sourcebook: Incorporating Social Dimensions into World Bank-Supported Projects (December 2003).

2.4.6 Recently, the International Finance Corporation prepared 'Policy on Social & Environmental Sustainability' (30 April 2006) which incorporated eight performance standards relating to:

- Performance standard 1: Social and Environmental Assessment and Management System;
- Performance standard 2: Labour and working conditions;
- Performance standard 3: Pollution Prevent and Abatement;
- Performance standard 4: Community Health, Safety and Security;
- Performance standard 5: Land Acquisition and Involuntary Resettlement;
- Performance standard 6: Biodiversity Conservation and Sustainable Natural Resource Management;
- Performance standard 7: Indigenous People; and
- Performance standard 8: Cultural Heritage.

2.5 HYDRO/QP COMPANY REQUIREMENTS

Hydro

2.5.1 Hydro has developed an internal corporate health, safety and environment (HSE) directive[10], which describes the necessary policy and requirements governing its approach to HSE and HSE management systems. The directive covers all HSE aspects and applies to all parts of Hydro's value chain and all other activities. It is Hydro policy that it is mandatory for this directive to apply to all joint ventures where Hydro has an ownership interest of more than 50%. For projects where Hydro has an ownership interest of 50% or less and for Contractors / suppliers, the policy requires Hydro to exert their influence to produce consistency with the directive.

2.5.2 The Hydro Corporate HSE policy states the following:

- "*Our ambition is to demonstrate a strong sense of responsibility for people and the environment and to be at the forefront in environmental care and industrial safety.*
- *In respect for the inherent worth of all people, the value of the earth and the resources it provides, Hydro is determined to work ambitiously, through continuous improvement, for a healthy work environment, safe and secure conduct, and low environmental impact.*
- *We will design our products, develop and use technology to produce minimum adverse effect on the environment, making efficient use of energy and resources.*
- *At the strategic and operational levels we will shape our businesses with due concern to HSE, including the health and safety of our neighbours.*
- *When acquiring or entering into commercial agreements with companies that are far from our standards, we shall set ambitious goals to ensure significant improvements in their HSE performance.*
- *We will systematically seek to deepen our understanding of HSE risks and effects of our activities, promote transparency and routinely publicize our health, security, safety and environment goals and report on status and progress in a dialogue with our stakeholders.*
- *We will continuously work to reduce environmental impacts and risks related to our activities, and contribute to sustainable products and production in a life-cycle perspective.*
- *We are determined to have no injuries on our premises, and work continuously to avoid work-related illnesses, property damage and production loss.*
- *We will encourage our employees to adopt a healthy, safe life-style for themselves and their families.*
- *If accidents occur, we shall be prepared to do the utmost to prevent and mitigate injury, damage to the environment, property and Hydro's reputation. Saving life has the highest priority.*
- *We will protect personnel, premises and activities against conscious and negligent unauthorised actions, balancing the company's need for protection of the integrity of employees and third parties.*"

2.5.3 Hydro's HSE management system includes procedures to ensure that:

- all activities shall be in compliance with statutory requirements and Hydro requirements;
- production sites shall be in compliance with the ISO 14001 standard or equivalent;
- Hydro shall achieve its goals through the systematic management of HSE risks and opportunities, and the development of and adherence to a common HSE management system built on good practice and experience; and
- Hydro encourages the use of nationally and internationally recognised standards, guidelines, procedures and acceptance criteria. If needed, sector specifications should be established for issues not covered by such.

2.5.4 An HSE programme will be developed specifically for the Qatalum Project, which will take into account Qatari Acts and Regulations and Hydro's and QP's Corporate Policies and requirements.

2.5.5 In addition to its HSE policy, Hydro is committed to sustainable value creation for its shareholders, its stakeholders and the communities in which it operates. As an international industrial and natural resources company, Hydro's operations impact the lives of a large number of people around the world; thus, Hydro pursues opportunities, while managing risks, taking the social impacts of business into consideration. This is what is commonly called Corporate Social Responsibility (CSR). Hydro's main CSR principles are:

- respect for human rights;
- contribution to sustainability;
- diversity and non discrimination;
- dialogue;
- integrity; and
- no tolerance towards bribery and corruption.

Qatar Petroleum

2.5.6 QP is committed to the highest standards for health safety and the environment (HSE) throughout its operations and has a long-term goal to ensure that QP employees and the people of Qatar live in a clean, safe world.

2.5.7 QP has recently reinforced its commitment to HSE through reorganisation and consolidation of all HSE activities and through establishing a direct line of reporting Corporate HSE to the Minister of Energy and Industry (MEI). QP is in the process of seeking accreditation to ISO14001 and are striving towards OHSAS 18001 certification.

2.5.8 The QP HSE system allows HSE issues to be identified, managed and streamlined through all QP operations and regions. It promotes a cycle of continuous improvement and ensures that QP HSE strategies and standards are aligned with national and international standards and regulations. The immediate HSE objectives are to:

- achieve zero gas flaring to minimize waste and reduce carbon dioxide emissions;
- maximize the utilization of energy resources to produce clean, safe energy;
- maintain and continuously improve security to ensure the safety of people and assets;
- achieve zero lost time injury through aggressive safety strategies; and
- attain a high level of preparedness to manage emergency incidents on land or at sea.

2.6 ENVIRONMENTAL PROTECTION CRITERIA, STANDARDS & GUIDELINES

Introduction

2.6.1 The Project must specifically adhere to the requirements set out in the Environmental Law[3] and the associated By-Law[4]. In addition, although not a regulatory requirement, the guidelines proposed by the MIC Authority[9] should be taken into consideration by industrial facilities at Mesaieed. Furthermore, the full EIA for the Project must make reference to the minimum applicable standards in the 1998 WB Pollution Prevention and Abatement Handbook (PPAH)[6]. This document contains detailed guidelines for a range of industrial sectors, including aluminium manufacturing and new thermal power plant; it also provides guidance on pollution management, good environmental practice.

2.6.2 Where numerical standards have not been developed by SCENR or the World Bank, the regulatory assessment criteria for the evaluating Project impacts have been derived from other sources of international standards or guidelines, such as:

- World Health Organisation (WHO);
- European Union (EU); and
- United States Environmental Protection Agency (US EPA).

2.6.3 The World Health Organization provides a number of recommended guidelines for various environmental pollutants and media (e.g. air quality, noise and drinking water guidelines). The guidelines are not mandatory but are generally accepted as levels which should not be exceeded. The WHO guidelines are generally developed to protect human health and may not necessarily be protective of the environment as a whole.

2.6.4 The European Commission develops and proposes European Union (EU) legislation. Draft proposals are submitted to the Council of Ministers, which approves, amends or rejects the proposals. The associated legislation can be produced in the form of Regulations, Directives, Decisions and Recommendations (the latter are not binding). The usual legislative form for environmental issues is a Directive (which is binding); however, the implementation of the directive is usually left to each EU Member State. Thus, in general, each European country also has its own standards and regulations, which can be more detailed and more stringent than the original EC directives.

2.6.5 In the United States (US), federal laws and regulations provide the basis for environmental protection. Federal laws are enacted by Congress and are generally approved by the President. Examples of environmental laws include: the Clean Air Act, the Solid Waste Disposal Act, and the Clean Water Act. The federal laws authorise the USEPA, or other federal agencies, to set regulations in order to ensure the implement of the laws at an operational level. USEPA has promulgated effluent limitations, guidelines, and standards in the last thirty years for many industries. Each of the individual States within the US may also enact laws and regulate environmental matters, with the stipulation that a particular State's regulations must be at least as stringent as the USEPA's.

2.6.6 Qatalum is committed to meeting all relevant Qatari Standards and to employing the best practical means to meet any more stringent international environmental standards/limit values.

2.6.7 In general, there are two types of standards / guidelines for the protection of the environment that are considered herein:

- ambient standards / guidelines; and
- emission standards / guidelines.

2.6.8 Ambient standards set maximum allowable levels of a pollutant in the receiving medium (e.g. air, water, and soil). Ambient standards can offer a simple method of establishing environmental priorities; since areas that comply with the relevant ambient standards can be considered to require no further intervention, while other areas may be ranked by the extent to which concentrations exceed the ambient standards. Historically, ambient standards in the industrial market economies have been continually tightened in the light of medical evidence on the impact of certain pollutants and in response to increased demand for better environmental quality.

2.6.9 Pollutants can result in acute (short-term) and/or chronic (long-term) effects on human health and/or on ecosystems. Thus, ambient standards and guidelines are usually expressed over averaging periods that reflect whether a substance has acute and/or chronic effects. Ambient standards can be set at different levels for different locations, e.g. a different standard may be set for the protection of human health than that for the protection of vegetation.

2.6.10 Emissions, or discharge, standards set maximum amounts of a pollutant that may be released by a plant or other source; typically expressed as a concentration. Emissions standards are generally established in terms of either:

- what can be achieved with available technology; or
- the impact of emissions on the ambient environment.

2.6.11 Technology-based standards are based on knowledge of what can be achieved with current equipment and practices. A wide range of principles are used, including "best available techniques" (BAT), "best practicable technology" (BPT), "best practicable environmental option" (BPEO) and "best available techniques not entailing excessive cost" (BATNEEC). These approaches are open to interpretation; however, all are related to establishing the highest levels of equipment and performance that can reasonably be demanded from industrial plants. Alternatively, emissions standards can be established by estimating the discharges that are compatible with ensuring that receiving areas around the plant meet the ambient standards defined for a pollutant.

2.6.12 The remainder of this section of the EIA provides a summary of Qatari ambient and emission standards for all relevant media, as well as some of those derived from international standards/guidelines and Hydro/QP company requirements. Process-specific emission standards for aluminium manufacture, based on BAT, are discussed further in 3.12 – Technology Selection and BAT.

Air Quality

Ambient Air Quality Criteria

2.6.13 The ambient air quality criteria, considered for the Qatalum Project, for the protection of human health are presented below in Table 2.1. The most relevant of these are the SCENR and World Bank standards / guidelines. Although not regulatory requirements, and only currently available in draft form, the MIC Guidelines have also been included for comparative purposes. Criteria specific to the protection of vegetation are presented and discussed in Section 6.6.

Table 2.1 – Ambient Air Quality Criteria for the Protection of Human Health

Pollutant	SCENR[4] µg/m³	MIC[9] [Guideline] µg/m³	World Bank[11] µg/m³	WHO[12] µg/m³	USEPA[13] µg/m³	EU[a14] µg/m³
Sulphur Dioxide						
1-hour	-	1300[e]	-	-	-	350[b]
24-hour	365[c]	365[c]	125	125[d]	365[e]	125[f]
Annual	80	80	50	50	80	
Nitrogen Dioxide						
1-hour	400[g]	660[e]	-	200	-	200[h]
24-hour	150[c]	400[e]	150	-	-	-
Annual	100	100	100[15]	40	100	40
Carbon Monoxide						
1-hour	40,000[g]	40,000[e]	-	30,000	40,000[e]	
8-hour	10,000[i]	10,000[e]	-	10,000	10,000[e]	10,000

Pollutant	SCENR[4] µg/m³	MIC[9] [Guideline] µg/m³	World Bank[11] µg/m³	WHO[12] µg/m³	USEPA[13] µg/m³	EU[a14] µg/m³
Particulate Matter (PM_{10})						
24-hour	150[c]	250[e,u]	70	-	150[e]	50[j]
Annual	50	100	50	-	50[k]	40
Particulate Matter ($PM_{2.5}$)						
24-hour	-	-	-	-	65[l]	-
Annual	-	-	-	-	15[k]	-
Ozone						
1-hour	235[m]	240 [e]	150	-	-	-
8-hour	120[n]	-	-	120	157[p]	120[s]
Hydrogen Fluoride						
See notes	-	1[t]	-	16[q]	14[r]	-

Notes:

a EU Daughter Directive Limit Values.

b 99.73th percentile (24 exceedences of 1-hourly standard per annum permitted).

c 99.7th percentile of daily averages during the period of one calendar year (1 exceedence of 24-hourly standard per annum permitted).

d 98th percentile (7 exceedences of daily mean per annum permitted).

e Not to be exceeded more than once per year.

f 99.2th percentile (3 exceedences of 24-hourly mean per annum permitted).

g 99.9th percentile of 1 hour measurements during the period of one calendar year (9 exceedences of 1-hourly standard per annum permitted).

h 99.8th percentile (18 exceedences of 1-hourly standard per annum permitted).

i 99.8th percentile of all daily maximum 8hr average measurements (2 exceedences of 8-hourly standard per annum permitted).

j Not be exceeded more than 35 times per year

k Not to be exceeded for the 3 year average of the weighted annual mean.

l 98th percentile of 24 hour averages over 3 years.

m 99.7th percentile (3 exceedences of 1-hourly standard per annum permitted but not in the same 24 hour period).

n 98th percentile (22 exceedences of 8-hourly standard per annum permitted).

p Fourth highest daily max 8 hour average over 3 years.

q WHO do not actually recommend a limit for HF for the protection of human health, however, the WHO's publication, Air Quality Criteria for Europe[12], states that: "no adverse effects have been found at levels up to 16 µg/m³ gaseous fluoride".

r HF is not on the USEPA list of criteria pollutants; however, the State of California has adopted a chronic Reference Exposure Level (REL) of 14 µg/m³ for HF[16]. (or 13 µg/m³ for fluorides). Chronic RELs are defined as levels that would pose no significant health risk to individuals indefinitely exposed to such levels, thus RELs can be considered in the same context as an annual average.

s Maximum daily 8-hour mean not to be exceeded more than 25 days per calendar year averaged over 3 years.

t monthly average.

u Exceedence of 24-hr criteria only acceptable if the particulate matter is not man-made.

Atmospheric Emission Standards

2.6.14 Since aluminium production is a new industry to Qatar there are no specific industry standards for this part of the Qatalum Project in the Executive By-Law[4]. The Qatari Standards do contain environmental criteria for stack emissions for Thermal Power Plant greater than 25 MWe; these are presented for NOx in Table 3.8, Section 3.12 – Technology Selection and BAT.

2.6.15 Standards/ limits for the Reduction Plant (Potrooms), Carbon Plant and Power Plant have been put forward based on what is considered to be BAT for these processes and by benchmarking against similar, existing, plant (see Section 3.12 – Technology Selection and BAT).

Water Quality

2.6.16 SCENR's water quality criteria have been developed to minimise adverse impacts to soils, groundwater and water quality and to protect marine life and water supply. The Executive By Law[4] includes the following water quality related standards of potential relevance to the Qatalum Project. The most pertinent of these are presented in tabular form below for the parameters of potential relevance to the Qatalum Project (see Table 2.2 and Table 2.3):

- standards for treated wastewater from industrial land based facilities used for irrigation;
- standards for the quality of cooling water; and
- standards for seawater quality.

2.6.17 The Executive By Law[4] also includes:

- standards for the discharge of industrial effluents into sewers;
- standards for the drainage of liquid waste to the public sewage works for treatment;
- standards for treated effluents in sanitary wastewater; and
- drinking water characteristics/properties.

2.6.18 The standards listed directly above have not been specifically considered for the Qatalum Project as there will be no discharges to sewer (other than sanitary waste, which will be treated in the MIC wastewater treatment works) and there will not be any on-site treatment of sanitary wastewater. The Project will not produce drinking water; however, a selection of the drinking water standards has been provided in Table 2.2 for comparative purposes.

2.6.19 In addition to the above, the non-statutory draft MIC Guidelines[9] include quality criteria for point source discharges to the Arabian Gulf and for wastewater to be used in landscaping and these are also presented in Table 2.2 below for comparative purposes. In common with many countries, SCENR does not have any specific criteria for groundwater quality; however, those for seawater quality, treated irrigation water and drinking water can be used to give an indication of groundwater quality and these are presented together below. It should however be recognised that the groundwater underlying the Qatalum Site is saline, and as such is unlikely to be used for drinking water purposes.

Table 2.2 – Standards / Guidelines for Water Quality

Parameters	Units	Treated Wastewater						Seawater Quality (Exec By-Law[4])	Drinking Water[a] (Exec By-Law[4])
		Irrigation (Exec By-Law[4])	Landscape (Exec By-Law)	Landscape monthly average (MIC Guidelines[9])	Landscape max allowable (MIC Guidelines[9])	Point Sources monthly average (MIC Guidelines[9])	Point Sources max allowable (MIC Guidelines[9])		
Total Dissolved Solids (TDS)	mg/l	2000	2000	1500	1700	1500	1700	-	1000
Total Suspended Solids (TSS)	mg/l	50	-	20	30	20	40	30	-
Floating Particles	mg/m^2	None	None	None	-	None	-	-	-
pH	-	6-9	6-9	6-9	-	6-9	-	6.5-8.3	6.5-8.5
Ammonia	mg/l	15 (as N)	15 (as N)	15 (as NH_4^+)	20 (as NH_4^+)	1 (as NH_4^+)	2(as NH_4^+)	15 (as N)	1.5 (as N)
Biological Oxygen Demand (BOD5)	mg/l	10	50	15	25	15	25	-	-
Chemical Oxygen Demand (COD)	mg/l	150	150	100	150	100	150	-	-
Chlorine (residual)	mg/l	0.1	0.1	0.5	1	0.5	1	-	
Chlorophyll	mg/l	-	-	-	-	-	-	1	-
Cyanide (total)	mg/l	Nil	0.2	0.1	0.5	0.05	0.1	-	0.07
Dissolved Oxygen (DO)	mg/l	>2	>2	>2	-	>2.5	-	>4	-
Fluoride (F^-)	mg/l	15	15	10	15	15	20	-	1.5
Nitrates	mg/l	-	-	-	-	-	-	100	50
Nitrites	mg/l	-	-	-	-	-	-	35	3
Phosphate (as Phosphorous)	mg/l	30	30	15	30	1	2	30[b]	-

Parameters	Units	Treated Wastewater						Seawater Quality (Exec By-Law[4])	Drinking Water[a] (Exec By-Law[4])
		Irrigation (Exec By-Law[4])	Landscape (Exec By-Law)	Landscape monthly average (MIC Guidelines[9])	Landscape max allowable (MIC Guidelines[9])	Point Sources monthly average (MIC Guidelines[9])	Point Sources max allowable (MIC Guidelines[9])		
Salinity		-	-	-	-	-	-	33-45	-
Silica	mg/l	-	-	-	-	-	-	900	-
Sulphate	mg/l	400	400	300	400	-	-	-	-
Sulphide	mg/l	0.1	0.1	0.1	0.5	0.05	0.1	-	0.05 (H_2S)
Total Kjeldahl Nitrogen (as nitrogen)	mg/l	35	35	50	75	5	8	-	-
Organic Compounds									
Oil and Grease	mg/l	10	10	8	15	5	10	-	-
Phenols	mg/l	0.5	0.5	0.1	1	0.1	0.5	-	-
Total Organic Carbon (TOC)	mg/l	75	75	50	75	50	75	-	-
Total Petroleum Hydrocarbons (TPH)	mg/l	-	-	-	-	-	-	5	-
Metals									
Aluminium (Al)	mg/l	15	15	15	20	15	20	-	0.2
Arsenic (As)	mg/l	0.1	0.1	0.1	0.5	0.1	0.5	-	0.01
Barium (Ba)	mg/l	2	2	1	2	1	2	-	0.7
Boron (B)	mg/l	1.5	1.5	0.75	1.5	-	-	-	0.5
Cadmium (Cd)	mg/l	0.05	0.05	0.01	0.05	0.01	0.02	0.7	0.003
Chromium (total) (Cr)	mg/l	0.01	0.2	0.1	0.2	0.1	0.5	-	0.05

Parameters	Units	Treated Wastewater						Seawater Quality (Exec By-Law[4])	Drinking Water[a] (Exec By-Law[4])
		Irrigation (Exec By-Law[4])	Landscape (Exec By-Law)	Landscape monthly average (MIC Guidelines[9])	Landscape max allowable (MIC Guidelines[9])	Point Sources monthly average (MIC Guidelines[9])	Point Sources max allowable (MIC Guidelines[9])		
Cobalt (Co)	mg/l	0.2	0.2	0.1	0.5	0.1	0.5	-	-
Copper (Cu)	mg/l	0.2	0.5	0.2	0.5	0.2	0.5	15	1-2
Iron (Fe)	mg/l	1	1	5	10	5	8	90	0.3
Lead (Pb)	mg/l	0.1	0.1	0.1	0.5	0.1	0.5	12	0.01
Manganese (Mn)	mg/l	0.05	0.05	0.02	0.05	0.2	0.5	-	0.1-0.5
Mercury (Hg)	mg/l	0.001	0.001	0.001	0.002	0.001	0.002	<0.4	0.001
Nickel (Ni)	mg/l	0.2	0.2	0.2	0.5	0.2	0.5	20	0.02
Vanadium (V)	mg/l	-	-	-	-	-	-	10	-
Zinc (Zn)	mg/l	0.5	0.5	2	5	1	3	-	3
Sodium Absorption Rate	mg/l	10	10	6	10	-	-	-	-

Notes:

a The drinking water limits have not been reproduced in full in the above table, since they are not directly relevant to the Qatalum Project and have only been included for comparative purposes.

b Standard is for phosphorous.

2.6.20 Supplementary sources of water quality standards/guidelines for groundwater and the marine environment are not presented here, however these have been considered in the seawater and groundwater baseline Sections of this report (see 5.3 and 5.4).

2.6.21 The main source of aqueous effluent from the Qatalum Project is the once through cooling water for the Power Station and Aluminium Plant. The Qatari Standards for cooling water are presented below.

Table 2.3 – SCENR Standards for Cooling Water

Parameters	Standard	Notes
Temperature Difference (ΔT) (from the intake temperature)	3ºC	Once through cooling water is to be discharged into a suitable blending area into the sea, to be determined in consultation with SCENR, using a hydrodynamic form of a 3D dispersal and after making an ecological study of the site. The difference in temperature is to be measured at the point where the water current enters the facility and at the edge of the point approved for water discharge and blending.
Daily Free Residual Chlorine	0.05 mg/l	Cooling water should be tested for the concentration of free residual chlorine at least 4 times per day, using samples collected by grab at the point of discharge into the water. As an alternative to the above, the operator may set out a fixed discharge limit at the site verified dispersion model for determining the 3°C, ΔT mixing zone limit.

Soil and Sediment Quality

2.6.22 The Executive By-Law[4] does not specify numerical standards for potential contaminants in soils and sediments; similarly, there are no internationally agreed soil and sediment quality standards.

Soil

2.6.23 Although not technically international standards, many appraisals of soil quality utilise the Dutch guidelines for soil contamination[17], also referred to as "The Dutch List". These guideline values, which have been generated using a risk-based approach, are intended to highlight the need for any potential remedial action and to present target values that should be achieved by the remedial works. The Dutch List values, typically used for initial screening of soil quality, are the Dutch Target Values (DTVs) and the Dutch Intervention Values (DIVs).

2.6.24 DTVs indicate the level at which there is a 'sustainable' soil quality (i.e. the concentrations at which the functional quality of the soil is suitable to humans, plant life and animal life). In addition, the DTVs provide an indication of the long-term environmental quality of the soil in relation to risks to ecosystems. DIVs indicate the concentrations at which soil remediation may be required (i.e. the concentrations at which the functional properties of the soil in relation to humans, plant life and animal life are seriously impaired or threatened). Where there are no DTVs or DIVs, Indicative Levels of Serious Contamination (ILSC) values have been derived. In general, ILSCs exist for substances where there may be larger uncertainties in the underlying risk assessment methodology used to generate these values.

Table 2.4 – The "Dutch List" Guidelines for Soils

Sample Number	Units	Dutch Soil Values	
		DTV	DIV
Metals			
Cadmium (Cd)	mg/kg	0.8	12
Chromium (Cr)	mg/kg	100	380
Copper (Cu)	mg/kg	36	190
Lead (Pb)	mg/kg	85	530
Nickel (Ni)	mg/kg	35	210
Selenium (Se)	mg/kg	0.7	100[a]
Vanadium (V)	µg/kg	42	250[a]
Zinc (Zn)	mg/kg	140	720
Organic Compounds			
Gasoline Range Hydrocarbons	µg/kg	10[b]	1,000[b]
Diesel Range Hydrocarbons	µg/kg	50,000[c]	5,000,000[c]
Heavy Fractions	µg/kg	50,000[c]	5,000,000[c]
Sum of 10 PAH[d]	µg/kg	1,000	40,000

a Indicative values for serious soil contamination.

b There is no standard for gasoline range organics; value for benzene has been used instead.

c Value for mineral oil.

d The 10 PAHs comprise anthracene, benzo(a)anthracene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, phenanthrene, fluoranthene, indeno(1,2,3-cd)pyrene, naphthalene and benzo(g,h,i)perylene.

Sediment

2.6.25 Although no internationally agreed sediment quality standards exist, most appraisals of sediment quality utilise two sets of guidelines generated by the Canadian and Dutch authorities.

2.6.26 Interim sediment quality guidelines have been adopted by Environment Canada[18] for a range of toxic substances. The concentrations are based on equilibrium partitioning (not necessarily relevant for metals) and expressed for a standard sediment consisting of 5% organic carbon. The Canadian guidelines include two values: an Interim Sediment Quality Standard (ISQG), which corresponds to threshold level effects below which adverse biological effects are not expected; and a Probable Effect Level (PEL), above which adverse effects would be expected. The values are set on effects-based observations and are expressed at bulk sediment concentrations.

2.6.27 The Dutch guidelines[19] also provide two values; a short-term Maximum Permissible Concentration (MPC), which takes into account background concentrations of 'naturally occurring' elements and to which a Maximum Permissible Addition (MPA) of the contaminant is added (based on toxicity data) to generate the standard. The second value is a lower threshold value, which has been derived to represent a longer term No Effect Concentration (NEC).

2.6.28 A selection of the Dutch and Canadian sediment quality guidelines are presented in Table 2.5.

Table 2.5 – Sediment Quality Guidelines

Parameter	Units	Canadian Guidelines		Dutch Guidelines	
		ISQG	PEL	Long-term NEC	Short-term MPC
Metals					
Cadmium	mg/kg	0.7	4.2	0.8	12
Chromium	mg/kg	52	160	100	380
Cobalt	mg/kg	-	-	20	240
Copper	mg/kg	19	106	36	73
Lead	mg/kg	30	112	85	530
Mercury	mg/kg	0.13	0.7	0.30	0.10
Nickel	mg/kg	-	-	35	44
Zinc	mg/kg	124	271	140	520
Organic Compounds					
Total hydrocarbons	µg/kg	-	-	50	1000
Total PCBs	mg/kg	21.5	189	-	-

Noise

Environmental Noise Standards

2.6.29 The Executive By Law[4] and draft, non-statutory MIC Guidelines[9] provide values for noise control to protect the population from exposure to elevated noise levels; both of these are presented below, along with the equivalent World Bank levels. Though not specifically stated, these standards are assumed to apply to normal operation of the plant and relate to L_{Aeq} levels.

Table 2.6 – Noise Standards and Guidelines

	Source[4, 9, 20]	Daytime dB(A)	Night Time dB(A)
Residential areas[c]	SCENR[a] MIC Guideline[b] World Bank[c]	55 50 55	45 50 45
Commercial[c]	SCENR[a] MIC Guideline[b] World Bank[c]	65 65 70	55 65 70
Industrial[d]	SCENR[a] MIC Guideline[b] World Bank[c]	75 75 70	75 75 70
Roadside areas – residential (1 m from building)	MIC Guideline[e]	70	-
Roadside areas – within building with windows closed	MIC Guideline[e]	50	-

Notes:

a Maximum noise limits (20 minutes average) outside the property boundary. Night time is defined as 22:00 – 04:00.

b Maximum noise measured at property line; no to be exceeded more than 10% of the time, excludes roadside areas

c Maximum allowable log equivalent (hourly) values, applicable at receptors outside of the Project boundary. Where these are not achievable, noise abatement should ensure that noise levels do not exceed an increase over background levels of 3 dB(A). Night time is defined as 22:00 – 07:00.

d In Qatar, residential areas are defined as those in which homes or residential buildings, including schools, hospitals and mosques, form more than 50% of the buildings. Commercial areas are those in which department stores, business offices, garages and places of work represent more than 50% of the buildings. The designation of Industrial area applies to an area in which industrial facilities represent more than 50% of the buildings.

e Measured as L_{10} (18 hours), representing the noise level that is exceeded 10% of the time over 18 hours (this is the hourly L_{10} measurement averaged arithmetically over the period 6:00 a.m. to midnight)

Construction Noise Standards

2.6.30 As per Article 69 of SCENR Environmental Protection Law[3], the same noise standards (see Table 2.6) that apply to operational activities also apply to construction noise.

Waste

2.6.31 Environmental legislation relating to solid waste management is covered in a number of documents, including Law by Decree No 30[3] and the recent Executive By-Law[4]. The Environmental Protection Law[3] defines the terminology and responsibilities that pertain to waste and sets out the functions of various bodies. The principle of "polluter-pays" is embodied in the document and a set of fines and penalties are defined for contravention and non-compliance. The largest fines are reserved for causing serious environmental damage.

2.6.32 Unauthorised dumping or burial of any wastes is prohibited, with special reference to hazardous wastes. Disposal of any wastes at sea is also prohibited. The law appears to allow practical solutions to be adopted, calling for the best available techniques to be used, providing it is economically feasible.

2.6.33 The draft, non-statutory, Environmental Guidelines & Environmental Protection Criteria for MIC[9] detail waste management requirements across MIC. The document describes the classification of wastes, storage instructions for hazardous and non-hazardous wastes, record keeping, disposal and transport requirements. In particular, it defines the criteria for disposal to landfill. Guidance for hazard minimisation and recycling is also provided.

2.6.34 For liquid waste streams, the draft MIC Guidelines[9] state the following:

- industrial and municipal wastewater should be segregated; and
- facilities should have the capacity to store 3 days of process wastewater on site.

Occupational Health

2.6.35 The SCENR has developed a series of standards for closed spaces of work; these include standards for noise, heat stress and dust.

2.6.36 In terms of noise levels within the plant boundary the aim is to set limits that will:

- minimise the risk of hearing damage to personnel;
- reduce speech and work interference;
- ensure the audibility of warning alarms;
- allow adequate speech, telephone and radio communication;
- maintain working efficiency; and
- provide quiet accommodation for personnel.

2.6.37 The noise limits within different areas of a production plant are usually set in order to help achieve these aims. Illustrative typical limits are given in Table 2.7.

Table 2.7 – Typical Area Noise Limits in Production Plants

Area	dBL_{Aeq} Limit
Work area generally and 1m from equipment	85
General workshops and machinery buildings (requiring communication) and light maintenance workshops	70
Workshop offices, control rooms (not continuously manned) and computer rooms	60
Control rooms (continuously manned), open plan offices, social rooms and changing rooms	50
Offices and conference rooms	45

2.6.38 The Executive By-Law[4] gives noise limits for Closed Places of Work. The 8-hour exposure level for unprotected persons is set at 85 dBL_{Aeq}, with the standard noise level/time trade-off for shorter periods of exposure at higher noise levels. The By-Law also notes that exposure should be limited to no more than 115 dBA, unless the employee is provided with ear plugs of the appropriate type. An absolute limit of 140 dBA is also noted. The Qatari noise exposure limits are generally in line with the WHO recommendations, although some countries are reducing the 8-hour exposure limit to 80 dBL_{Aeq}.

2.6.39 Standards / guidelines relating to occupational exposure are presented in the Impact Assessment Chapter of this report, Section 6.11 – Occupational Health and Safety.

2.7 OTHER CONSIDERATIONS

Articles 60 and 61 of the Executive By-Law[4].

2.7.1 Article 60 states that "no projects or facilities shall be built within at least 200 m from the seaboard line without the approval of the competent administrative authority in coordination with the Council". Article 61 states that "it is prohibited to carry out any activity that affects the natural seaboard line or change it by moving towards the seawaters or the tidemark without the approval of the competent administrative authority which will be granted in coordination with the Council". The Ministry of Industry is understood to be the competent administrative authority for approving exceptions from these clauses in areas regulated for industrial use.

Terrestrial Ecological Requirements

2.7.2 Article 9 of the Law by Decree No. 30 of the Year 2002 Promulgating the Environmental Protection Law (2003)[3] states that the Council shall have the right to:

- prevent hunting of rare natural living organisms;
- prevent cutting, uprooting or eradicating wild trees, shrubs and grass;
- establish and administer natural reserves;
- preserve the living resources of the local domesticated animals and the local plants that are of economic value, and to improve the same.

Best Available Techniques

2.7.3 Although not explicitly stated in the recent Executive By-Law[4], SCENR expect that new industries will be established on the basis of best available technology. There are three related terms commonly used in this context:

- Best Available Techniques (BAT);
- Best Available Techniques Not Entailing Excessive Cost (BATNEEC); and
- Best Practicable Environmental Option (BPEO).

BPEO

2.7.4 The use of BPEO as a means of controlling pollution was first proposed by the Royal Commission on Environmental Pollution (RCEP) in its Fifth Report (1976)[21], as an early form of air pollution control. The report suggested that a unified pollution inspectorate should be established whose aim would be "*to achieve the best practicable environmental option taking account of the total pollution from a process and the technical possibilities for dealing with it*". In its 12th Report (1988)[22], the RCEP defined its concept of BPEO in more detail and included guidelines on its implementation. The refined concept defined BPEO as: "the outcome of a systematic decision-making procedure which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole, at acceptable cost, in the long-terms and well as in the short-term".

2.7.5 Under the BPEO procedure, pollution control technology should consider:

- the total impact on water, land and air pathways together;
- the ability of the pathway to absorb the pollutant in light of critical loads, where appropriate; and
- the principles of sustainable development.

BAT and BATNEEC

2.7.6 The EU Directive on Integrated Pollution Prevention and Control (IPPC)[23] was adopted in 1996. The main purpose of the IPPC Directive is to *"achieve integrated prevention and control of pollution"* from a wide range of industrial and agricultural activities. This is to be done by preventing, or where that is not practicable, reducing emissions to air, water and land by potentially polluting activities "*so as to achieve a high level of protection of the environment taken as a whole"*.

2.7.7 The IPPC directive[23] introduced "BAT", which further develops the BATNEEC concept, originally introduced in the EU framework directive on combating air pollution from industrial plant[24]. BAT requires competent authorities to ensure that *"installations are operated in such a way that all appropriate preventative measures are taken against pollution, in particular through the application of best available techniques…"*. The definition of these terms is as follows:

- 'best available techniques' are defined as *"the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for*

emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole";

- 'available techniques' means those *"developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages…"*;
- 'best', in relation to techniques, is defined as the *"most effective in achieving a high general level of protection of the environment as a whole"*; and
- 'techniques' *"includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned"*.

2.7.8 The Qatalum Project will consider the requirements of BAT, which encompasses both the BPEO and BATNEEC philosophies. It is assumed that the detailed design will incorporate the general concepts of BAT described in documents such as the EC BREF Note for the Non-Ferrous Metals Industry[7]. The Qatalum EIA report focuses on those aspects of BAT which appear to have the most significant cost, schedule and environmental implications. BAT, as considered applicable to the Qatalum Project, is discussed further in Section 3.12 – Technology Selection and BAT.

Agenda 21

2.7.9 The Qatari Government adopted the plan of action and principles outlined in Agenda 21 of the UN Conference on Environment and Development (UNCED or the Earth Summit) held in 1992 in Brazil. Commitment to these principles was re-affirmed at the World Summit on Sustainable Development (WSSD) in South Africa, in 2002.

2.7.10 The main aim of the Earth Summit was to find ways to "halt and reverse the effects of environmental degradation" while increasing efforts "to promote sustainable and environmentally sound development in all countries". Agenda 21 aims to provide guidance for governments in establishing environmental policies that meet the needs of sustainable development; it covers all areas of pollution, energy policy, population and development issues. These principles need to be considered and upheld by new developments.

Greenhouse Gases

2.7.11 Qatar has ratified the UN Framework Convention on Climate Change (UNCCC) and the Kyoto Protocol. The UNCCC sets an overall framework for intergovernmental efforts to tackle climate change. Under the convention, governments:

- gather and share information on greenhouse gas emissions, national policies and best practices;
- launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including provision of financial and technological support to developing counties; and
- cooperate in preparing for adaptation to the impacts of climate change.

2.7.12 The 1997 Kyoto protocol shares the Convention's objective, principles and institutions but significantly strengthens the Convention by committing Annex I parties to individual legally binding targets to limit, or reduce, their greenhouse gas emissions.

Biological Diversity

2.7.13 Qatar has ratified the UN Convention on Biological Diversity, which aims to protect and preserve endangered species on land and in the ocean. The Convention came into force in December 1993; as of August 2000 178 countries had ratified the Convention. Under the Convention, states are required to draw up a list of "protected areas". The three main goals of the Convention are:

- conservation of diversity;
- the sustainable use of the components of biodiversity; and
- the fair and equitable sharing of the benefits arising from use of genetic resources.

2.7.14 The impact of any new development must take into account the aims of the Convention.

Ozone Depleting Substances

2.7.15 Despite having ratified the Montreal Protocol in 1996, the State of Qatar has been designated as an "Article 5 Country". Article 5 of the Montreal Protocol relates to developing countries whose annual calculated consumption of controlled substances is less than 0.3 kg per capita (ca) on the date of entry into force of the protocol. In order to meet its basic domestic needs, the State of Qatar is entitled to delay compliance with the control measures set out in Articles 2A to 2E of the protocol for 10 years.

The Basel Convention

2.7.16 The Basel Convention on the control of transboundary movements of hazardous wastes and their disposal was prepared under the auspices of UNEP and came into force in May 1992. The Convention takes as a basic principle the need to reduce the generation of hazardous wastes and to keep their transboundary movements to a minimum. Under the Convention, all states have the right to ban the import of hazardous wastes; the accord also prevents signatory states from accepting hazardous wastes from non-signatory countries.

2.7.17 An exporting state has a duty to ensure that all wastes, whether for recovery or disposal, can be dealt with in an environmentally sound manner; it also has a duty to arrange for the return of any wastes failing to go to an appropriate treatment or disposal site. Any wastes which are exported must be labelled, packaged and transported in accordance with recognised international standards.

2.7.18 An amendment to the Convention, agreed by the signatories in 1998, defines and categorises the type of wastes controlled in three lists. List A includes over 50 categories of wastes defined as hazardous; List B covers those waste categories which the Basel Convention does not define as hazardous but which nevertheless may contain hazardous characteristics and thus be covered by the ban. A further List C covers wastes awaiting classification.