

The Environment Matters

Annual Report 2009

www.gibraltar.gov.gi/environment

Department of the Environment
Government of Gibraltar

Annual Report 2009

Produced by the Department of the Environment in collaboration with the Environmental Agency

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Foreword from the Minister

This year has seen Gibraltar progress on a number of fronts, most notably our implementation of the Energy Performance of Buildings Directive and the commencement of our Water Framework coastal water sampling programme.

The Department of the Environment's continuing efforts to implement new initiatives to improve and monitor our environment are a reflection of the Government's broader commitment to safeguarding our living environment for future generations.

I hope you will find this annual report to be educational and informative as it provides you with a useful insight into the current state of our local environment.

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Executive Summary

Gibraltar continues to work towards improving the quality of the local environment with this year once again seeing new developments.

In terms of air quality, Gibraltar continues to meet the majority of the European Commission's target values for regulated pollutants including benzene, ozone, sulphur dioxide and carbon monoxide. The limit values for nitrogen dioxide have again been exceeded, both at the Rosia Road and Witham's Road monitoring stations. The data confirms that elevated nitrogen dioxide levels are a result of emissions from the OESCO power station and the Inter Services Generating Station. It is expected that the closure of these stations in the near future will result in lower nitrogen dioxide levels, in compliance with the Directive. The closure of these two stations together with the Gibelec Power Station at Waterport and the building of an up-to-date and best available technique compliant power station will form the basis of our Time Extension Notification (TEN) application which is being prepared for the Government by UK consultants AEA Energy & Environment and is due in late 2010.

In terms of water quality, Gibraltar has embarked upon its coastal water monitoring programme, in compliance with its requirements under the Water Framework Directive. Numerous physical and chemical quality elements along with their respective environmental quality standards and biological quality elements are being assessed in order to classify Gibraltar's water quality status and inform the development of our River Basin Management Plan, also due in 2010.

The implementation of the Energy Performance of Buildings Directive was a highlight of 2009. This legislation aims to reduce the amount of carbon emissions associated with buildings by reducing their energy consumption. UK consultants BRE were contracted by the Government of Gibraltar to develop the necessary software and provide the training to local professionals to allow us to carry the programme of building certification forward. In addition to this, the Government has published its Energy Efficiency Action Plan which contains measures aimed at reducing energy consumption throughout the residential, commercial and industrial sectors. In combination it is hoped that these initiatives will help to reduce Gibraltar's overall energy needs and lower our carbon emissions.

Public awareness and education again featured prominently in the Department's work as it continued with its environmental education programme in schools and hosted another World Environment Day.

2010 will see continuing developments with the publishing of the Gibraltar River Basin Management Plan, further work on our air quality management, the release of our Air Quality Action Plan and the publication of the Environmental Action & Management Plan.

Chapter 1:

Air Quality

1.1 Introduction

This section of the report provides an overview of Gibraltar's air quality measurements for the 2009 calendar year, including data from both the automatic and non-automatic monitoring networks.

The Gibraltar Air Monitoring Programme consists of three automatic monitoring stations measuring a variety of pollutants and a passive monitoring network measuring nitrogen dioxide and six species of Volatile Organic Compounds by diffusive samplers. The equipment deployed throughout the network is set out in Table 1.

Table 1 The Gibraltar Air Monitoring Programme

Location	Pollutants Measured	Equipment Types
Electricity Offices Rosia Road	Sulphur dioxide	API M100E (Ultraviolet Flourescence)
	Oxides of nitrogen	API M200E (Chemiluminescence)
	Carbon monoxide	API M300E (Infrared Absorption)
	PM_{10} Gravimetry	R&P Partisol 2025
	$PM_{2.5}$ Gravimetry	R&P Partisol 2025
	PM_{10} Automatic	TEOM FDMS
	Poly Aromatic Hydrocarbons	Digitel High Volume Sampler
	Volatile Organic Compounds	Environment VOC71M Gas Chromatograph
	Wind speed & direction	Gill Windsonic
	Ambient temperature	Met One 592
Bleak House Near Europa Point	Oxides of nitrogen	API M200E (Chemiluminescence)
	Ozone	API M400E (Ultraviolet absorption)
	PM_{10} Gravimetry	R&P Partisol 2025
	Wind speed & direction	Gill Windsonic
	Ambient temperature	Met One 592
Withams Road	Oxides of nitrogen	API M200E (Chemiluminescence)
	Wind speed & direction	Gill Windsonic
	Ambient temperature	Met One 592
Passive Network Various locations	Nitrogen Dioxide	Diffusive Samplers - Palmes Tubes at 27 sites
	Volatile Organic Compounds	Diffusive Samplers – Sorbent Tubes at 15 sites

The instrumentation deployed was selected to ensure that Government was able to obtain robust measurements at the necessary level of accuracy and time resolution to meet the data quality objectives within the European Air Quality Directives and national legislation.

The primary objectives of the monitoring network are:

- To provide the public with rapid and reliable information on urban air quality
- To monitor compliance with European Directives and local statutory instruments
- To assist in the development of new policies

The monitoring equipment itself forms only one aspect of the overall air monitoring programme. Appropriate maintenance and support, coupled to a well designed and managed quality control regime, ensure that the raw monitoring data obtained is successfully processed, analysed and interpreted, in order to provide information and ensure compliance requirements under the Air Quality Framework and Air Quality Daughter Directives.

Gibraltar air pollutant measurements are underpinned by a rigorous quality assurance and control programme, central to which are cross-checked calibration standards that are traceable to and compared with internationally recognised metrology standards.

The non-automatic network consists of a diffusion tube programme for nitrogen dioxide and benzene, toluene and xylenes (BTX) as well as three partisol filter (gravimetric) units which are used to monitor particulate matter (PM_{10} & $PM_{2.5}$), lead, arsenic, cadmium, nickel and a Digitel High Volume Sampler which monitors Poly Aromatic Hydrocarbons (measured as Benzo(a)pyrene).

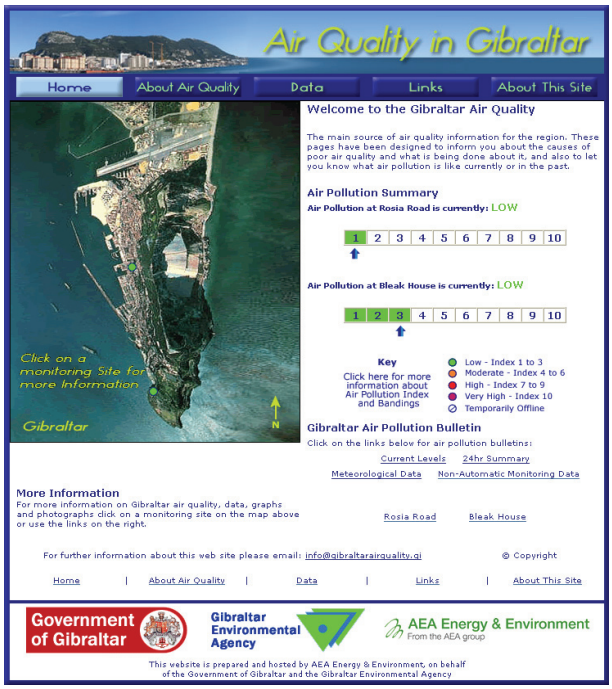


Fig.1 Gibraltar Air Quality Website

In addition to meeting the Government of Gibraltar's monitoring obligations, the data itself is disseminated in near real-time on the www.gibraltarairquality.gi website. This web-based dissemination and reporting represents an important tool for the delivery of air quality data and descriptive statistics to a broad range of end-users.

The website provides wide and unrestricted access to air quality data. The archive has been designed to be user-friendly, interactive and responsive. Users may download unlimited portions of the database in spreadsheet or graph formats. The website has proved to be popular and continues to attract a large number of visitors each year as can be seen in Table 2.

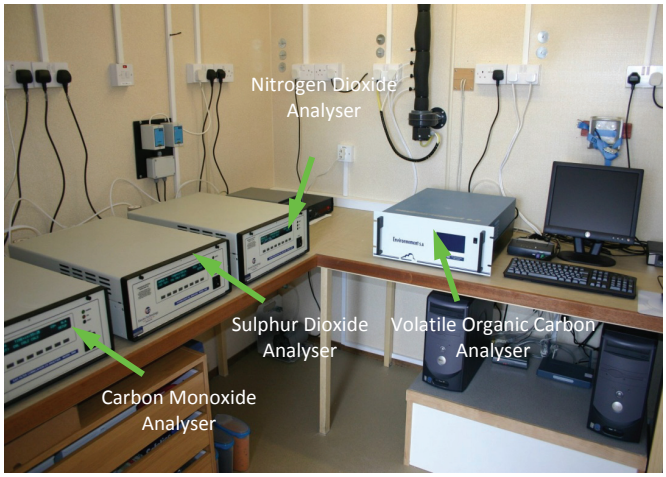


Fig.2 Inside Rosia Road Station

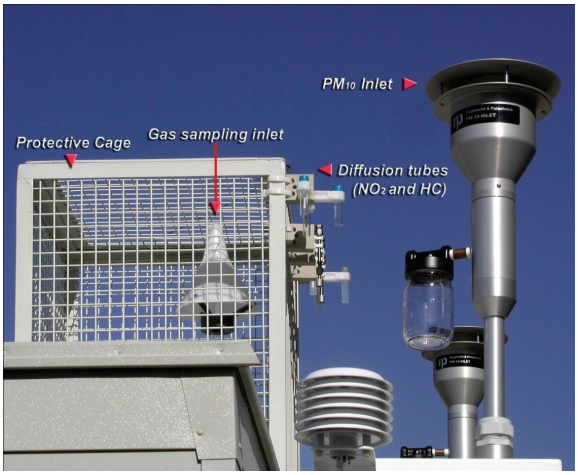


Fig.3 NO_2 diffusion tubes

Table 2. Gibraltar Air Quality Website Hits 2009

Month	Unique visitors	Number of visits	Pages
Jan	2208	3570	11193
Feb	1899	3622	9347
Mar	2220	3970	10231
Apr	1898	4088	8386
May	2250	6436	11440
Jun	1994	4627	9529
Jul	2622	6140	9883
Aug	2331	5773	8667
Sep	1773	4757	6642
Oct	1964	5461	7848
Nov	1888	4833	7143
Dec	2567	5845	9211
Total	25614	59122	109520

1.2 Gibraltar Air Quality Standards

Standards and objectives for air pollutant concentrations in ambient air are set at levels considered to be acceptable in light of what is known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to monitor whether air pollution is getting better or worse.

The Gibraltar ambient air quality standards, in place for the purpose of Local Air Quality Management, are found in the Public Health (Air Quality Limit Values) Rules 2002 as amended by the Public Health (Air Quality Limit Values) (Amendment) Rules 2002 and the Public Health (Air Quality) (Ozone) Rules 2004. A summary of the current Gibraltar Air Quality Objectives are set out in Table 3.

Table 3: Summary of Gibraltar Air Quality Objectives

Pollutant	Objective	Measured as	To be achieved by
Benzene	5 µg m^{-3}	Annual Mean	1 January 2010
Carbon monoxide	10.0 mg m^{-3}	Maximum daily running 8 Hour Mean	1 January 2005
Lead	0.5 µg m^{-3}	Annual Mean	1 January 2005
Nitrogen dioxide	200 µg m^{-3} Not to be exceeded more than 18 times per year	1 Hour Mean	1 January 2010
	40 µg m^{-3}	Annual Mean	1 January 2010
Nitrogen Oxides**	(V) 30 µg m^{-3}	Annual Mean	19 July 2001
Ozone	120 µg m^{-3}	Daily maximum running 8 hr mean not to be exceeded more than 25 times per calendar year averaged over 3 years	1 January 2010
Particles[a] (PM_{10}) (gravimetric)	50 µg m^{-3} Not to be exceeded more than 35 times per year	24 Hour Mean	1 January 2005
	40 µg m^{-3}	Annual Mean	1 January 2005
Sulphur dioxide	350 µg m^{-3} Not to be exceeded more than 24 times per year	1 Hour Mean	1 January 2005
	125µg m^{-3} Not to be exceeded more than 3 times per year	24 Hour Mean	1 January 2005
	(V) 20 µg m^{-3}	Annual Mean	19 July 2001
	(V) 20 µg m^{-3}	Winter Mean (01 October – 31 March)	19 July 2001

Arsenic	6 ng m^{-3}	Annual Mean	31 December 2012
Cadmium	5 ng m^{-3}	Annual Mean	31 December 2012
Nickel	20 ng m^{-3}	Annual Mean	31 December 2012
PAH (Benzo[a]pyrene*)**	1 ng m^{-3}	Annual Mean	31 December 2012

Notes:

a. Measured using the European gravimetric transfer sampler or equivalent.

µg m^{-3} – micrograms per cubic metre

mg m^{-3} – milligrams per cubic metre

ng m^{-3} – nanograms per cubic metre

** Assuming NOx is taken as NO_2

*** Benzo[a]pyrene is used as a marker for the carcinogenic risk of polycyclic aromatic hydrocarbons in ambient air.

(V) These standards are adopted for the protection of vegetation and ecosystems. All of the remainder are for the protection of human health.

1.3 Annual Automatic Data Summary Reports

1.3.1. Rosia Road 1st January to 31st December 2009

Table 4 (These data have been fully ratified)

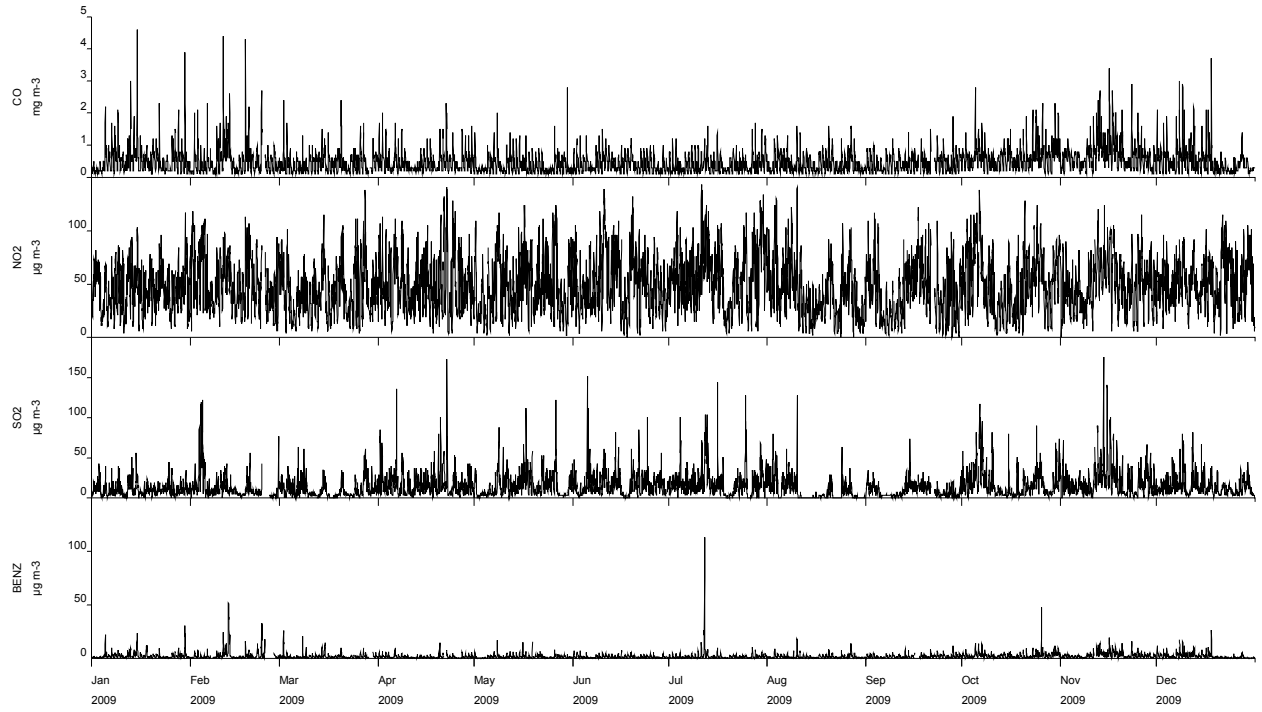
POLLUTANT	CO	NO_2	SO_2	BENZENE
Number Very High	0	0	0	-
Number High	0	0	0	-
Number Moderate	0	0	0	-
Number Low	8659	8619	33506	-
Maximum 15-minute mean	6.6 mg m^{-3}	210 µg m^{-3}	229 µg m^{-3}	-
Maximum hourly mean	4.6 mg m^{-3}	143 µg m^{-3}	176 µg m^{-3}	113.17 µg m^{-3}
Maximum running 8-hour mean	1.9 mg m^{-3}	120 µg m^{-3}	111 µg m^{-3}	37.10 µg m^{-3}
Maximum running 24-hour mean	1.3 mg m^{-3}	107 µg m^{-3}	70 µg m^{-3}	15.94 µg m^{-3}
Maximum daily mean	1.2 mg m^{-3}	102 µg m^{-3}	67 µg m^{-3}	13.56 µg m^{-3}
Average	0.5 mg m^{-3}	48 µg m^{-3}	14 µg m^{-3}	1.92 µg m^{-3}
Data capture	98.8 %	98.4 %	98.4 %	96.8 %

All mass units are at 20'C and 1013mb

Table 5

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedences	Days
Carbon Monoxide	Running 8-hour mean > 10.0 mg m^{-3}	0	0
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	1	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	0	0
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	0	0
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	0	0
Sulphur Dioxide	Annual mean > 20 µg m^{-3}	0	-

Graph 1: Hourly Mean Data for 01 January to 31 December 2009



1.3.2 Bleak House 1st January to 31st December 2009

Table 6 (These data have been fully ratified)

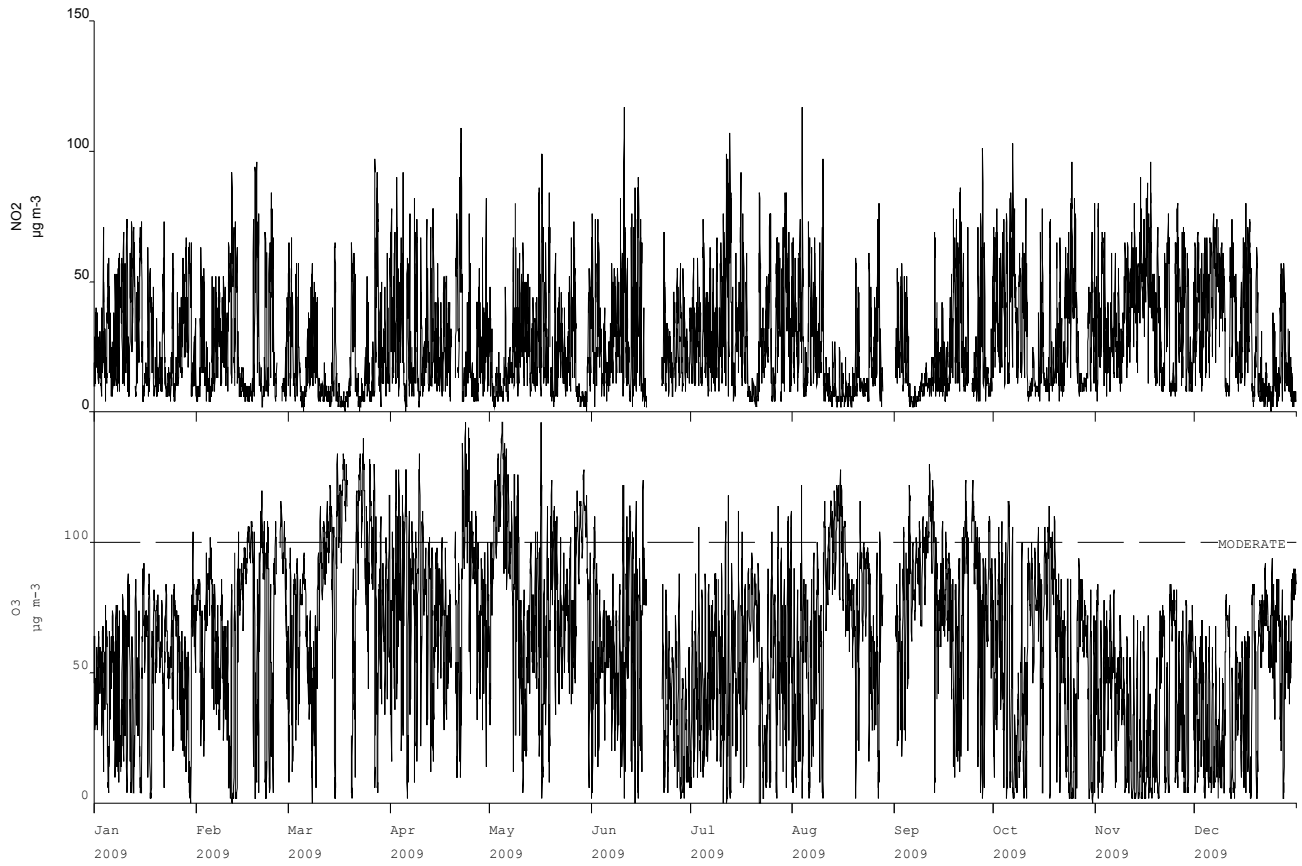
POLLUTANT	NO_2	O_3
Number Very High	0	0
Number High	0	0
Number Moderate	0	1273
Number Low	8415	7184
Maximum 15-minute mean	139 µg m^{-3}	154 µg m^{-3}
Maximum hourly mean	117 µg m^{-3}	146 µg m^{-3}
Maximum running 8-hour mean	87 µg m^{-3}	144 µg m^{-3}
Maximum running 24-hour mean	68 µg m^{-3}	134 µg m^{-3}
Maximum daily mean	59 µg m^{-3}	128 µg m^{-3}
Average	26 µg m^{-3}	62 µg m^{-3}
Data capture	96.1 %	96.2 %

All mass units are at 20'C and 1013mb

Table 7

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0
Ozone	Running 8-hour mean > 120 µg m^{-3}	138	20

Graph 2: Hourly Mean Data for 01 January to 31 December 2009



1.3.3 Witham's Road 1st January to 31st December 2009

Table 8 (These data have been fully ratified)

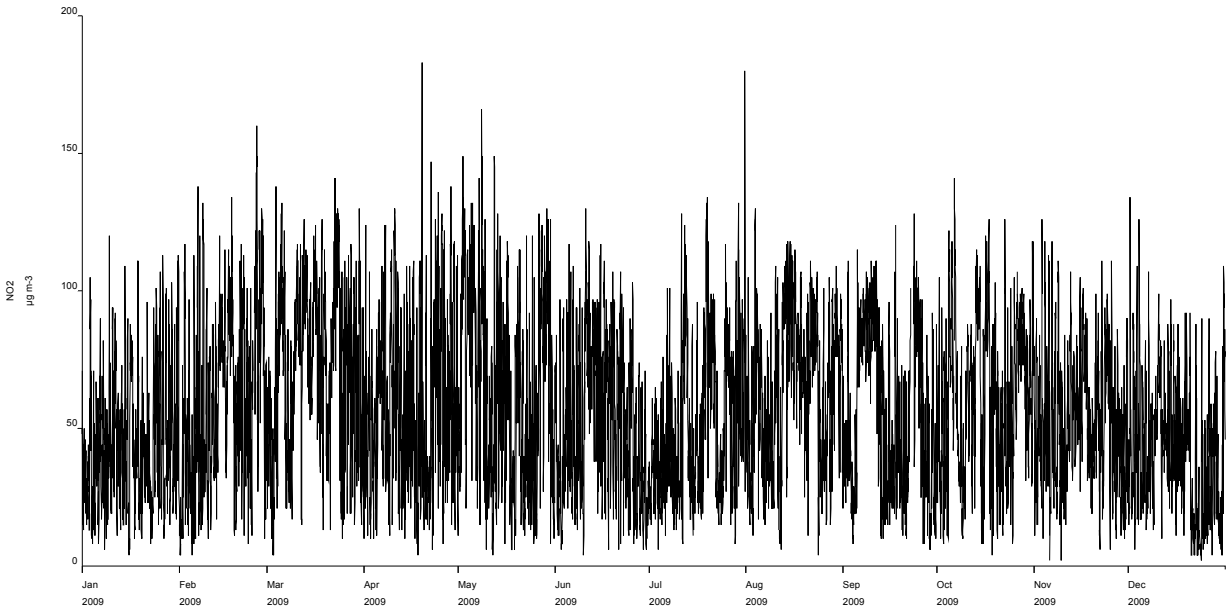
POLLUTANT	NO_2
Number Very High	0
Number High	0
Number Moderate	0
Number Low	8700
Maximum 15-minute mean	216 µg m^{-3}
Maximum hourly mean	183 µg m^{-3}
Maximum running 8-hour mean	128 µg m^{-3}
Maximum running 24-hour mean	115 µg m^{-3}
Maximum daily mean	115 µg m^{-3}
Average	57 µg m^{-3}
Data capture	99.3 %

All mass units are at 20'C and 1013mb

Table 9

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedences	Days
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	1	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0

GRAPH 3: Hourly Mean Data for 01 January to 31 December 2009



1.4 An Overview of Gibraltar's Automatic Air Pollution Measurements

The data capture figures reflect data capture over the whole year, 1st January to 31st December 2009.

Table 10. Data Capture in 2009 (%)

	UK	Gibraltar	
NO_2 and NO_x	86.8	97.9	✓
SO_2	92.3	98.4	✓
CO	94.1	98.8	✓
PM_{10} (grav.)	77.8	98.0	✓
$PM_{2.5}$ (grav.)	78.8	99.7	✓
O_3	89.5	96.2	✓
Benzene	88.2	96.4	✓

Gibraltar data capture remains above the target 90% for all pollutants for both the automatic and non-automatic monitoring.

Gibraltar data capture is on average higher than UK national networks and has been since its inception.

Gibraltar aims to obtain at least 90% data capture in any one year. Any problems with the analysers have been promptly attended to, helping to maintain the high levels.

1.4.1 Carbon Monoxide

Carbon Monoxide (CO) is a colourless, odourless, poisonous gas produced by incomplete or inefficient combustion of fuel. It is predominantly produced by the road transport sector, particularly by petrol engines. This gas prevents the normal transport of oxygen by the blood which in turn can lead to a significant reduction in the supply of oxygen to the heart, particularly in people suffering from heart disease.

This pollutant is measured solely at the Rosia Road station.

Air Quality Objective for CO (as maximum daily running 8 hour mean)	Recorded levels (as maximum daily running 8 hour mean)
10.0 mg m^{-3}	**1.9mg m^{-3}**

Gibraltar's recorded levels are well below the maximum permissible under the air quality rules (and EU Directives). The level recorded this year is below last year's when a maximum running 8 hour mean of 2.4 mg m^{-3} was recorded. Carbon monoxide levels over the years 2005 – 2009 show that we are well within the recommended level.

Summary: There were no exceedences of the carbon monoxide air quality objectives within our National Rules or the European Limit Values.

1.4.2 Nitrogen Dioxide

Nitrogen oxides (NO_x) is a collective term used to refer to two species of oxides of nitrogen, nitric oxide (NO) and nitrogen dioxide (NO_2). NO is mainly derived from road transport emissions and other combustion processes such as the electricity supply industry. NO is not considered to be harmful to health, however, once released into the atmosphere, NO is usually very rapidly oxidised to NO_2 which can be harmful to human health, irritating the lungs and lowering resistance to respiratory infections such as influenza.

This pollutant has been measured at the Rosia Road and Bleak House Stations since the start of monitoring in 2005, and at Witham's Road since mid-2008.

There are two air quality objectives for NO_2: a long term annual mean objective, set to protect against long term exposure to elevated NO_2 concentrations; and a short term 1 hour objective, set to protect against short term elevated NO_2 concentrations.

The annual mean air quality objective for NO_2 is 40 µg m^{-3}, to be achieved by 2010. The EU Directive also sets a temporary 'margin of tolerance' (MOT) in relation to this limit value which decreases annually until 2010. The MOT is intended to help identify those areas where current air quality is worst and acts as a trigger to encourage action to be taken to ensure that the limit value will be met, whilst also ensuring that exceedences of the limit value that are expected to disappear without additional measures do not trigger the need to produce plans & programme.

Air Quality Objective for NO_2 (Annual Mean Objective + Margin of Tolerance) 2009	Recorded levels (Annual Mean)
42 µg m^{-3}	**48 µg m^{-3} (Rosia Road)** **57 µg m^{-3} (Witham's Road)** **26 µg m^{-3} (Bleak House)**

As the results in the table above show, the NO_2 Annual Mean + MOT for 2009 was exceeded at both the Rosia Road and Witham's Road stations.

As a result of these exceedences, the Government has proceeded to prepare its submission for a Time Extension Notification (TEN) to the European Commission. The work programme contained

in the proposal includes the existing policy measure to construct a new, fully IPPC compliant power station.

The 1 hour air quality objective for nitrogen dioxide is 200µg m^{-3} not to be exceeded more than 18 times per year, to be achieved by 2010.

Air Quality Objective for NO_2 (1 hour mean)	Maximum Recorded levels (1 hour mean)
200 µg m^{-3} not to be exceeded more than 18 times per year	**143 µg m^{-3} (Rosia Road)** **183 µg m^{-3} (Witham's Road)** **117 µg m^{-3} (Bleak House)**

There was therefore no exceedence of the 1 hour air quality objective for nitrogen dioxide at any of the stations.

1.4.3 Sulphur Dioxide

Sulphur Dioxide (SO2) is produced when a material, or fuel, containing sulphur is burned. Globally, much of the sulphur dioxide in the atmosphere comes from natural sources, but in Gibraltar the predominant source is the power station and shipping burning fuel oils.

Even moderate concentrations of sulphur dioxide may result in a fall in lung function in asthmatics. Tightness in the chest and coughing occur at high levels and lung function of asthmatics may be impaired to the extent that medical assistance is required. Sulphur dioxide pollution is considered more harmful when particulate and other pollution concentrations are high.

This pollutant is measured at the Rosia Road station.

There are two air quality objectives set for SO_2, a daily mean objective and a 1 hour objective.

Air Quality Objective for SO_2 (Daily Mean)	Maximum Recorded levels (Daily Mean)
125 µg m^{-3} not to be exceeded more than 3 times per year	**67 µg m^{-3}**
Air Quality Objective for SO_2 (1 hour mean)	Maximum Recorded levels (1 hour mean)
350 µg m^{-3} not to be exceeded more than 24 times per year	**176 µg m^{-3}**

Summary: There were no exceedences of either limit value for Sulphur Dioxide in 2009.

1.4.4 Benzene

Benzene is a volatile organic compound which is a minor constituent of petrol (approximately 1% by volume). The main sources of atmospheric benzene in Europe are the distribution and combustion of petrol. Of these, combustion by petrol vehicles is the single biggest source.

Possible chronic health effects include cancer, central nervous system disorders, liver and kidney damage, reproductive disorders and birth defects.

This pollutant is measured at the Rosia Road station.

The air quality objective for benzene is 5 µg m^{-3}, measured as an annual mean. This objective is to be achieved by 2010. The EU Directive also sets a temporary 'margin of tolerance' (MOT) in relation to this limit value which decreases annually until 2010. The MOT is intended to help identify those areas where current air quality is worst and acts as a trigger to encourage action to be taken to ensure that the limit value will be met, while also ensuring that exceedences of the limit value which are expected to disappear without additional measures do not trigger the requirement to produce plans and programmes.

The annual mean's margin of tolerance in 2009 is 1 µg m^{-3} this means that the Annual Mean + MOT in 2009 is 6 µg m^{-3}. In 2009 the annual mean was measured at 1.92 µg m^{-3} which is below the Benzene Annual Mean + MOT and the Limit Value itself.

Air Quality Objective for Benzene (Annual Mean + MOT)	Maximum Recorded levels (Annual Mean)
6 µg m^{-3}	**1.92 µg m^{-3}**

Summary: There was no exceedence of the Benzene annual mean objective in 2009.

1.4.5 Ozone

Ozone (O_3) is not directly emitted from any man-made source in significant quantities. In the lower atmosphere, O_3 is primarily formed by the sunlight-initiated oxidation of volatile organic compounds (VOCs) in the presence of nitrogen oxides (NO_x). The sources of VOCs are similar to those described for NO_x above, but also include other activities such as solvent use and petrol handling & distribution.

The chemical reactions do not take place instantaneously, therefore ozone measured at a particular location may have arisen from VOC and NO_x emissions many hundreds or even thousands of miles away. Maximum concentrations generally occur downwind of the source areas of the precursor pollutant emissions. Ozone irritates the airways of the lungs, increasing the symptoms of those suffering from asthma and lung diseases.

This pollutant is measured at Bleak House Station.

The air quality target value is expressed as a maximum daily 8 hour mean of 120 µg m^{-3}.

This 2010 target value should not be exceeded more than 25 days per calendar year averaged over 3 years. This target value was exceeded on 20 days during 2009 (Table 7). The maximum hourly mean was recorded as 146 µg m^{-3}, which is below the EU Information Threshold of 180 µg m^{-3} and the EU Alert Threshold of 240 µg m^{-3}.

Air Quality Objective for Ozone (Maximum Daily 8 Hour Mean)	Maximum Recorded levels (Daily 8 hour Mean)
120 µg m^{-3} not to be exceeded more than 25 days per calendar year, averaged over 3 years.	**146 µg m^{-3}** **Target value exceeded on 20 days**

Summary: There was no exceedence of the Ozone objective.

1.5 An Overview of Gibraltar's Non-Automatic Air Pollution Measurements

1.5.1 Lead

The majority of Lead (Pb) emissions arise from vehicles fuelled with leaded petrol. Industry, in particular secondary non-ferrous metal smelters, may contribute to emissions of lead in industrial areas, though none exist within Gibraltar. This source can become increasingly significant due to the reduction in the lead content of leaded petrol and the increasing use of unleaded petrol (leading to significant reductions in urban lead levels).

Even small amounts of lead can be harmful, especially to infants and young children. In addition, lead taken in by the mother can interfere with the health of the unborn child. Exposure has also been linked to impaired mental function, visual-motor performance and neurological damage in children, and memory and attention span.

The air quality objective for lead is 0.5µg m^{-3} measured as an annual mean to have been achieved by 2005. The 2009 annual mean was measured at 0.01µg m^{-3}.

Air Quality Objective for Lead (measured as an annual mean)	Recorded Annual Mean
0.5µg m^{-3}	**0.01µg m^{-3}**

There was no exceedence of the Lead annual mean objective.

1.5.2 Particulate Matter PM_{10}

Fine particles are composed of a wide range of materials arising from a variety of sources including:

- combustion sources (mainly road traffic);
- secondary particles, mainly sulphate and nitrate formed by chemical reactions in the atmosphere, and often transported from far across Europe;
- coarse particles, suspended soils and dusts (e.g. from the Sahara), sea salt, biological particles and particles from construction work.

Particles are measured in a number of different size fractions according to their mean aerodynamic diameter. Most of the monitoring requirements are currently focused on PM_{10}, but the finer fractions such as $PM_{2.5}$ and PM_1 are becoming of increasing interest in terms of health effects. Fine particles can be carried deep into the lungs where they can cause inflammation and a worsening of the condition of people with heart and lung diseases. In addition, they may carry surface-absorbed carcinogenic compounds into the lungs.

There are two air quality objectives set for particulate matter (measured as the PM_{10} size fraction) - a daily mean objective and an annual mean objective.

The annual mean air quality objective for PM_{10} is 40µg m^{-3}, the Daily mean objective is set at 50 µg m^{-3}, not to be exceeded on more than 35 days per year. These objectives were to be met by 2005. The 2009 annual mean was measured as 38.2µg m^{-3} and the Daily mean of 50 µg m^{-3} was exceeded on 37 days. However following adjustments for natural sources the annual mean has been reduced to 34.8 µg m^{-3} and the daily exceedences have been reduced to 15.

Air Quality Objective for PM_{10} (measured as an annual mean)	Recorded Annual Mean
40 µg m^{-3}	**34.8 µg m^{-3}**
Air Quality Objective for PM_{10} (measured as a daily mean)	No. of exceedences of maximum daily mean
50 µg m^{-3} not to be exceeded more than 35 times in a year	**15**

The report – "**Measured PM_{10} concentrations in Gibraltar in 2009 - removal of the natural component" -** can be viewed on the following web address:-
www.gibraltarairquality.gi/documents/Gib_natural_quantification_2009_v2.pdf

Table 11 PM_{10} Statistics for Rosia Road

	2006	2007	2008	2009
Valid Days of Data	362	362	330	356
% Data Capture	99	99	90	98
Annual Mean PM_{10} (40 µg m^{-3})*	39.7	45	41	38.2**
Max. 24-hour mean PM_{10}	91.9	249.8	179	79
Days > 50 µg m^{-3} (35 day limit)*	61	109	63	37***

* Limit values – annual mean and maximum number of days daily limit value can be exceeded

** This figure has been reduced to 34.8 µg m^{-3} after adjustments for natural sources.

*** This figure has been reduced to an estimated 15 exceedences following the removal of the components of natural sources.

1.5.3 Particulate matter $PM_{2.5}$

Particulate matter $PM_{2.5}$ was measured at the Rosia Road station in compliance with Part 4 of the Directive on Ambient Air Quality & Cleaner Air for Europe (2008/50/EC). The annual mean was measured at 16.1 µg m^{-3}. This figure together with the 2010 and 2011 figures will be used to establish the Annual Exposure Indicator (AEI) for 2010. Based on the AEI for 2010, the national exposure reduction target for Gibraltar will be established in accordance with the table in Section B of Annex XIV to Directive 2008/50/EC.

1.5.4 Arsenic, Cadmium, Nickel and Poly Aromatic Hydrocarbons (measured as Benzo(a)pyrene)

Arsenic, Cadmium and Nickel are human genotoxic carcinogens. Evidence suggests that there is no identifiable threshold below which these substances do not pose a risk to human health. Impact on human health and the environment occurs via concentrations in ambient air and via deposition. The major sources of these metals in the Gibraltar region are likely to be Shipping and Power Generation. Target values are set with the aim of minimising harmful effects on human health, paying particular attention to sensitive populations, and the environment as a whole, of airborne arsenic, cadmium and nickel.

Polycyclic Aromatic Hydrocarbons are toxic organic micro pollutants (TOMPS) that cause a wide range of effects, from cancer to reduced immunity to nervous system disorders and interfere with child development. There is no "threshold" dose - the tiniest amount can cause damage. Target values are set with the aim of minimising harmful effects on human health, paying

particular attention to sensitive populations, and the environment as a whole, of airborne Polycyclic Aromatic Hydrocarbons. Benzo[a]pyrene is used as a marker for the carcinogenic risk of polycyclic aromatic hydrocarbons in ambient air.

Monitoring in Gibraltar to support a Preliminary Assessment under the 4th Daughter Directive began late 2005.

TABLE 12 Pollutants regulated by 4th Daughter Directive

Pollutants regulated by 4th Daughter Directive			
Pollutant	**Parameter**	**Target Value**	**Recorded Average**
Arsenic	Annual average	6 ng m^{-3}	0.9 ng m^{-3}
Cadmium	Annual average	5 ng m^{-3}	0.33 ng m^{-3}
Nickel	Annual average	20 ng m^{-3}	12.05 ng m^{-3}
BAP	Annual average	1 ng m^{-3}	0.12 ng m^{-3}

The Preliminary Assessment Study revealed that mandatory fixed monitoring for nickel was required within Gibraltar. The recommendation was that the monitoring should be conducted at a roadside location on a major road and close to key power generation and shipping sources. This recommendation was put into place in 2008. The annual averages recorded reveal that arsenic, cadmium, nickel and poly aromatic hydrocarbons are well below their corresponding target value. The high level of Nickel recorded in 2008 means that we need to observe this particular heavy metal closely, though in 2009 the recorded level was well within the 2012 the target value.

Although arsenic, cadmium, nickel and poly aromatic hydrocarbons were below their corresponding lower assessment levels, it is, however, recommended that these metals and poly aromatic hydrocarbons continue to be monitored.

1.6 Diffusion Tube Networks

Diffusion tube samplers are used to measure nitrogen dioxide (NO_2) and hydrocarbons across Gibraltar. Monitoring sites were selected to include areas likely to be affected by specific emission sources (such as heavy traffic, power generation plants, petrol stations, or vents from fuel storage), as well as general background locations.

NO_2 and hydrocarbon (BTEX) diffusion tubes are exposed for 4-week periods and are bias adjusted using data from co-location studies carried out at Rosia Road, Witham's Road and Bleak House. The precision of NO_2 and BTEX tubes was very good and the accuracy was within the expected range for an indicative method such as diffusive samplers (+/-25%).

1.6.1 Hydrocarbon Diffusion Network

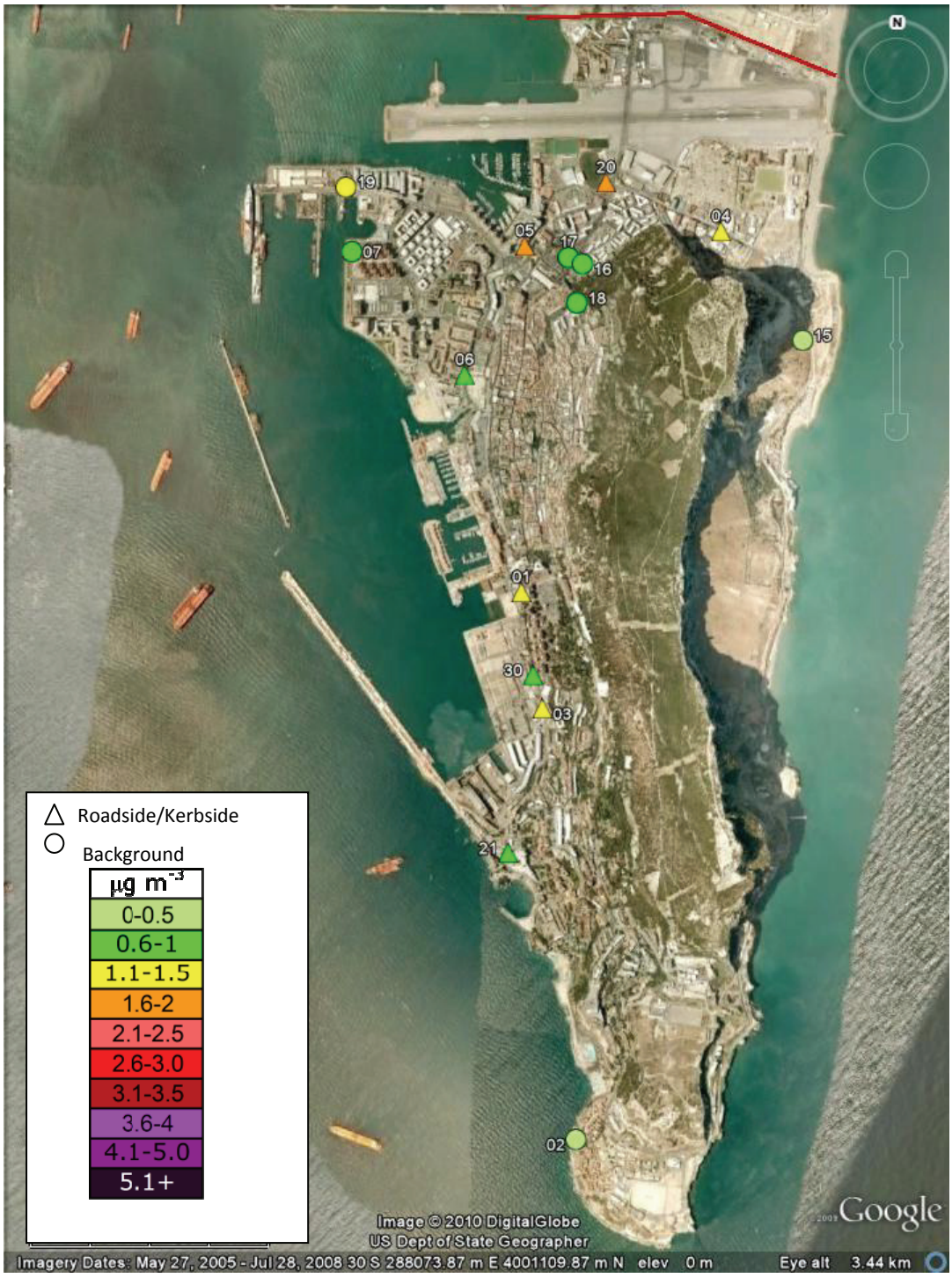


Fig 4. Benzene annual average concentrations for 2009 (Limit value for benzene is 5 µg m^{-3})

1.6.2 Summary of Hydrocarbon Results

A summary of 2009 annual average hydrocarbon concentrations is shown in Table 13. Bias adjustment factors derived from the co-location study at Rosia Road have been applied to these annual means.

Table 13: Annual Average Hydrocarbon Concentrations 2009 (µg m^{-3})

No.	Site	Type	Benzene	Toluene	Ethyl Benzene	m+p Xylene	o Xylene
1	Rosia Rd - GIB1	R	2.0	7.8	2.3	6.6	3.2
2	Bleak House - GIB2	B	0.8	1.5	0.7	2.3	1.0
3	Jumper's - Rosia Rd	K	1.7	6.3	2.3	6.9	3.0
4	Devil's Tower Road	K	1.8	9.2	2.1	8.8	2.9
5	Glacis Rd	K	2.3	10.7	2.7	7.7	3.9
6	Queensway	R	1.5	5.7	1.7	4.7	2.1
7	Harbour Views	B	1.5	3.5	1.0	3.0	1.9
15	Catalan Bay Rd	B	0.7	2.4	0.6	1.4	0.7
16	Laguna Estate	B	1.2	3.8	1.3	3.6	1.8
17	Kings Lines Fuel Depot	B	1.5	5.7	1.4	4.2	2.1
18	Moorish Castle Estate	B	1.2	4.4	1.2	3.2	1.6
19	North Mole	K	1.7	5.2	1.6	5.1	2.8
20	Winston Churchill Roundabout	K	2.2	9.6	2.4	7.2	3.6
21	Anchorage - Rosia Rd	K	1.4	4.0	5.6	16.6	4.9
30	Governors Meadow - Rosia Prom	R	1.19	3.5	1.3	4.1	2.0
		Minimum site	0.7	1.5	0.6	1.4	0.7
		Maximum site	2.3	10.7	5.6	16.6	4.9

Bias adjustment factors-Benzene 1.24, Toluene 1.15, Ethylbenzene 1.05,m+p-xylene 1.04 o xylene 1.15

1.6.2.1 Benzene

Annual mean benzene levels across Gibraltar in 2009 are shown in Table 14. The concentrations measured were between 0.7 µg m^{-3} and 2.3 µg m^{-3}. Background concentrations at Bleak House and Catalan Bay Road were 0.8 µg m^{-3} and 0.7 µg m^{-3} respectively. Highest levels continue to be measured at Glacis Road near a busy road (2.3 µg m^{-3}) and at Winston Churchill Roundabout (2.2 µg m^{-3}).

1.6.2.2 Toluene

Toluene levels range from 1.5 µg m^{-3} to 10.7 µg m^{-3} across Gibraltar in 2009. Background concentrations at Bleak House and Catalan Bay Road were 1.5 µg m^{-3} and 2.4 µg m^{-3} respectively. Highest levels were measured at Glacis Road (10.7 µg m^{-3}), Devil's Tower Road (9.2 µg m^{-3}) and Winston Churchill Roundabout (9.6 µg m^{-3}).

1.6.2.3 Ethyl-benzene

Ethyl-benzene annual mean concentrations are plotted. The levels ranged between 0.6 and 5.6 µg m^{-3}. Background concentrations at Bleak House and Catalan Bay Road were 0.7 and 0.6 µg m^{-3} respectively. Highest levels were measured at Anchorage (Rosia Rd) (5.6 µg m^{-3}). This is nearly double the following highest: Glacis Road (2.7 µg m^{-3}), Winston Churchill Roundabout (2.4 µg m^{-3}) and Jumper's and Rosia Road (2.3 µg m^{-3}).

1.6.2.4 m+p-Xylene

m+p-Xylene levels between 1.4 and 16.6 µg m^{-3} were measured across Gibraltar in 2009. Background measurements at Bleak House and Catalan Bay Road were 2.3. µg m^{-3} and 1.4 µg m^{-3}, respectively. Highest levels were measured at Anchorage (16.6 µg m^{-3}). This again is more than double the levels measured at the following highest: Devil's Tower Rd (8.8 µg m^{-3}), Glacis Road (7.7 µg m^{-3}), Winston Churchill Roundabout (7.2 µg m^{-3}) and Jumper's (6.9 µg m^{-3}).

1.6.2.5 o-Xylene

o-Xylene levels were measured across Gibraltar in 2009 between 0.7 and 4.9 µg m^{-3} . Background concentrations at Bleak House and Catalan Bay Road were 1.0 µg m^{-3} and 0.7 µg m^{-3}, respectively. Highest levels were measured at Anchorage (Rosia Road) (4.9 µg m^{-3}), Glacis Road (3.9 µg m^{-3}) and Winston Churchill Roundabout (3.6 µg m^{-3}) and Rosia Road (3.2 µg m^{-3}).

NOTE- There are no recommended limits for ambient concentrations of toluene, ethyl-benzene or xylene.

Table 14. Annual Averages for Benzene and Toluene between 2005 and 2009 (µg m^{-3})

No.	Site	Type	Benzene					Toluene				
			05	06	07	08	09	05	06	07	08	09
1	Rosia Rd	R	2.3	2.7	2.3	1.7	2.0	8.3	7	5.6	5.9	7.8
2	Bleak House	B	0.8	0.9	1.1	0.8	0.8	3.6	1.3	1.9	1.5	1.5
3	Jumper's	K	2	2.3	1.9	1.7	1.7	7.8	6.4	5.1	6.4	6.3
4	Devil's Tower Rd	K	2.4	2.8	2.1	1.6	1.8	13.8	14.6	8.2	9.4	9.2
5	Glacis Rd	K	3.8	3.4	2.6	2.2	2.3	14.9	9.5	7.1	9.6	10.7
6	Queensway	R	3	3.4	3	1.5	1.5	11.9	9.8	7.4	4.9	5.7
7	Harbour Views	B	1.4	1.9	2	1.5	1.5	4.5	3.8	3.4	3.9	3.5
15	Catalan Bay Rd	B	0.7	1.1	1	0.7	0.7	1.8	2.4	1.1	1.3	2.4
16	Laguna Estate	B	1.5	2.6	1.5	1.1	1.2	5.5	6.1	3.3	3.5	3.8
17	Kings Lines	B	2	2.2	1.7	1.3	1.5	11.5	5.5	3.9	4.8	5.7
18	Moorish Castle	B	1.2	1.5	1.5	1.2	1.2	6.3	3.1	3.4	3.8	4.4
19	North Mole	K	1.6	3	3.1	1.7	1.7	6.7	6.8	4.4	5	5.2
20	Winston Churchill	K			2.6	2	2.2			7.3	9	9.6
21	Anchorage	K			1.6	1.4	1.4			3	3.6	4.0
30	Governors Meadow	R			1.3	1.1	1.2			2.9	3.1	3.5
Average			**1.9**	**2.3**	**2.0**	**1.4**	**1.5**	**8.1**	**6.4**	**4.6**	**5.0**	**5.5**
Min			**0.7**	**0.9**	**1.0**	**0.7**	**0.7**	**1.8**	**1.3**	**1.1**	**1.3**	**1.5**
Max			**3.8**	**3.4**	**3.1**	**2.2**	**2.3**	**14.9**	**14.6**	**8.2**	**9.6**	**10.7**

1.6.3 Hydrocarbon Results

- No sites had annual mean benzene concentrations greater than the EC Limit Value or Gibraltar AQ Objective of 5 µg m^{-3} in 2009.
- The highest levels of benzene were measured at Glacis Road , one of Gibraltar's busiest roads.
- The highest annual mean benzene concentration was 2.3µg m^{-3} measured at Glacis Road followed by 2.2µg m^{-3} measured at the Sundial roundabout . At all other sites the annual

mean benzene concentration was 2.0µg m^{-3} or less. All sites met the Gibraltar Air Quality Objective (and EC Limit Value) of 5µg m^{-3} for annual mean benzene concentration, which is to be achieved by 2010.

- Overall, results from the non-automatic network survey in 2009 are consistent with those obtained during the 2005-2008 surveys.

1.6.4 Nitrogen Dioxide Network

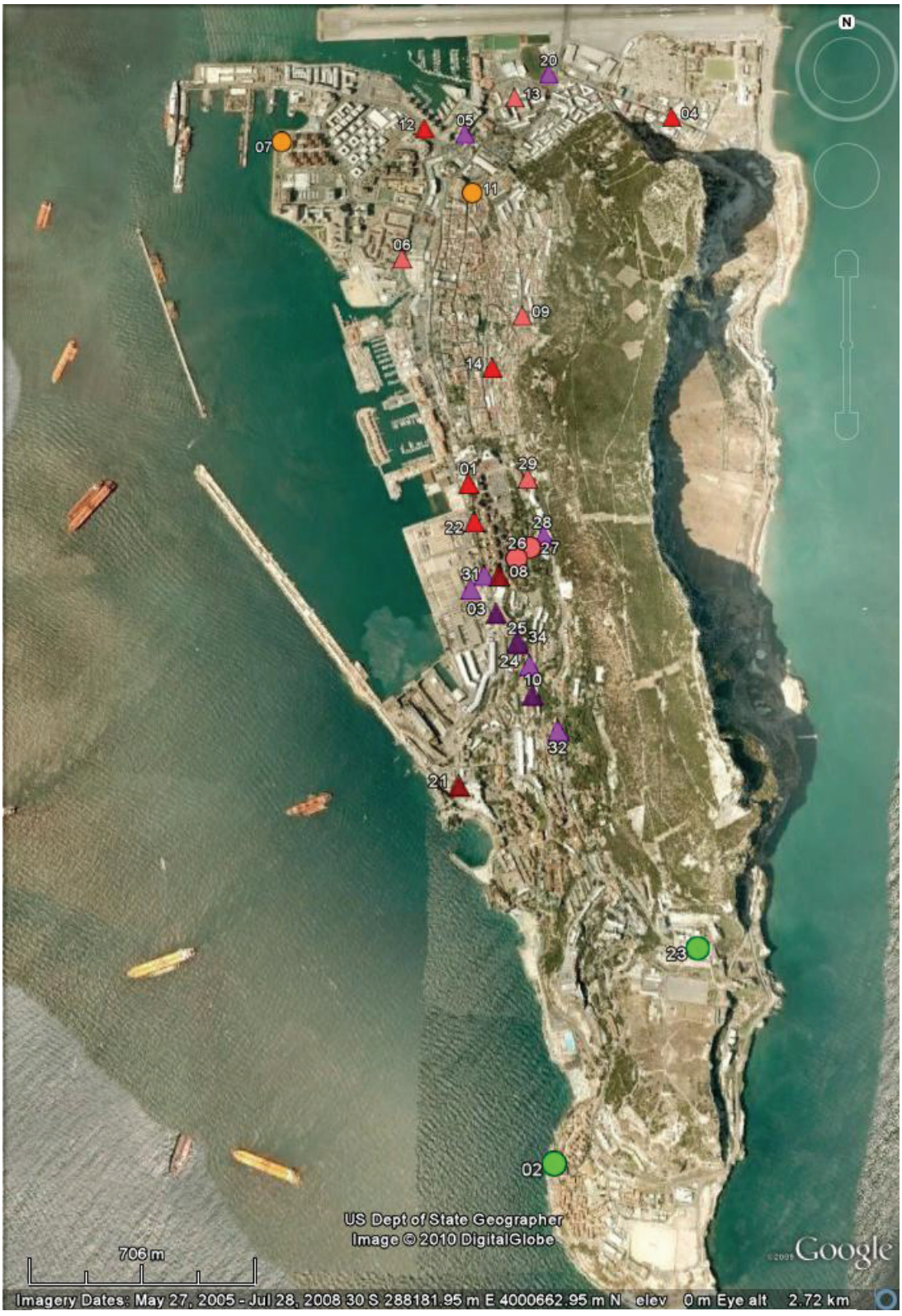


Fig 5. NO_2 annual average concentrations for 2009

Annual mean NO_2 concentrations for 2009 range from 42 µg m^{-3} to 64 µg m^{-3} at kerbside sites, 41 µg m^{-3} to 60 µg m^{-3} at roadside sites and 25 µg m^{-3} to 41 µg m^{-3} at background sites.

The highest annual mean concentrations (64 µg m^{-3}) were measured at Jumper's (on Rosia Road) followed by Witham's Road at 61 µg m^{-3}. As can be seen below in Table 15, other sites geographically close to these also exhibited elevated concentrations of NO

Table 15: Annual Mean NO2 Concentrations in Gibraltar 2009

Site	Name	Type	NO_2 conc. µg m^{-3}
site 01	Rosia Rd - GIB1	R	46
site 02*	Bleak House - GIB2	B	26
site 03	Jumper's - Rosia Rd	K	64
site 04	Devil's Tower Road	K	48
site 05	Glacis Rd	K	59
site 06	Queensway	R	41
site 07	Harbour Views	B	39
site 08	Red Sands Rd	K	52
site 09	Lime Kiln Rd	K	45
site 10	South Barracks Rd	K	61
site 11	Main St No.7	B	38
site 12	Water Gardens	R	49
site 13	George Don House	K	44
site 14	Prince Edwards Rd	K	47
site 20	Winston Churchill Roundabout	K	57
site 21	Anchorage - Rosia Rd	K	52
site 22	Picton House - Rosia Prom	R	48
site 23*	Lathbury Industrial park	B	25
site 24	Upper Withams Entrance	K	57
site 25	Withams Rd	K	64
site 26	Almeda Gardens - Theatre	B	41
site 27	Almeda Gardens - Main Access	B	41
site 28	Rock Hotel - Europa Rd	K	56
site 29	Gardiner's Rd	K	42
site 30	Governors Meadow - Rosia Prom	R	56
site 31	Dockyard Rd	K	59
site 32	Woodford Cottages - Europa Rd	K	57
site 34	Witham's Rd - GIB	R	60

*All data bias adjusted using a factor of 0.93, derived from the 2009 co-location at Rosia and Witham's Rd, with the exception of sites 2 and 23 which are corrected using a factor of 0.71 derived from Bleak House

Background concentrations across Gibraltar seem to vary between the northern built up area, the Jumper's area at the Alameda Gardens and the less built-up area in the southern part of

Gibraltar. The NO_2 levels of around 38-39 µg m^{-3} (Harbour Views and Main St) were measured at background locations in the north, while concentrations in the south were considerably lower (25-26 µg m^{-3} at Lathbury Industrial Park and Bleak House). Levels at both sites within the Alameda Gardens were 41 µg m^{-3}.

Annual mean NO_2 concentrations at twenty-one sites were greater than, or equal to, the EC Directive Limit Value plus margin of tolerance for 2009 (42µg m^{-3}).

Comparison with 2005-2008 data

Table 16 shows the annual mean NO_2 concentrations measured between 2005 and 2009. The number of sites above the Limit Value plus margin of tolerance (MOT) has increased in 2009 compared with previous years. This is a result of the decrease in the 2009 MOT and an increase of levels at most sites across 2009. The values coloured in red represent concentration above the LV+MoT and in purple concentrations between the LV and LV+MoT.

Table 16: Annual Mean Concentrations of NO2 since 2005

Site	Name	Type	NO_2 concentration µg m^{-3}				
			2005 (LV+MOT =50)	2006 (LV+MOT =48)	2007 (LV+MOT =46)	2008 (LV+MOT =44)	2009 (LV+MOT =42)
03	Jumper's - Rosia Rd	K	64	57	56	61	64
25	Withams Rd	K	-	-	56	59	64
05	Glacis Rd	K	51	48	53	55	59
28	Rock Hotel - Europa Rd	K	-	-	49	54	56
34**	Withams Rd	K	-	-	-	53	60
10	South Barracks Rd	K	59	51	54	53	61
20	Winston Churchill Roundabout	K	-	-	49	53	57
31	Dockyard Rd	K	-	-	51	52	59
32	Woodford Cottages-Europa Rd	K	-	-	49	52	57
21	Anchorage - Rosia Rd	K	-	-	47	52	52
24	Upper Withams Entrance	K	-	-	52	51	57
30	Governors Meadow-Rosia Prom	R	-	-	49	50	56
08	Red Sands Rd	K	47	45	46	49	52
04	Devil's Tower Road	K	46	45	45	48	48
01	Rosia Rd - GIB1	R	42	42	44	46	46
22	Picton House - Rosia	R	-	-	43	45	48

	Prom						
12	Water Gardens	R	**43**	**42**	**43**	**45**	**49**
14	Prince Edwards Rd	K	**41**	**40**	**42**	**43**	**47**
09	Lime Kiln Rd	K	**40**	**40**	**41**	**41**	**45**
13	George Don House	K	38	39	39	39	**44**
07	Harbour Views	B	34	32	35	39	39
06	Queensway	R	34	35	36	37	**41**
11	Main St No.7	B	36	35	37	37	38
27	Alameda Gardens - Main Access	B	-	-	35	37	**41**
29	Gardiner's Rd	K	-	-	35	37	**42**
26	Alameda Gardens - Theatre	B	-	-	37	37	**41**
02*	Bleak House - GIB2	B	28	27	25	26	26
23*	Lathbury Industrial park	B	-	-	21	25	25
Average initial 2005 sites			43	41	43	**44**	**47**
Average all sites inc. 2007 new sites			-	-	43	**45**	**49**

Note: (Bias adjustment factor = 0.93 derived from co-location at Rosia Road in 2005)
(Bias adjustment factor = 0.83 derived from co-location at Rosia Road in 2006)
(Bias adjustment factor = 0.83 derived from co-location at Rosia Road in 2007)
(Bias adjustment factor = 0.91 derived from co-location at Rosia Road in 2008)
(Bias adjustment factor = 0.93 derived from co-location at Rosia Road in 2009)

1.7 Conclusions & Recommendations

The Ratified Data for the automatic air pollution monitoring network shows that there were no exceedences of the carbon monoxide, sulphur dioxide, ozone and benzene objectives contained in our national legislation or within the European Air Quality Directives or Daughter Directives. Nitrogen dioxide exceeded the annual mean objective of 40 µg m^{-3} which should be met by 2010 at both Withams Road and Rosia Road. The annual mean's Margin of Tolerance (MOT) in 2009 was 2 µgm^{-3}.

This makes the annual mean plus MOT 42 µg m^{-3}. The annual mean at Rosia Road automatic monitoring station was 48 µg m^{-3}, which is slightly up on 2008. The annual mean plus MOT for 2009 was therefore exceeded at this monitoring station. The annual mean at Withams Road monitoring station was 57 µg m^{-3} again slightly up on 2008. The Government of Gibraltar has commissioned UK consultants AEA Energy & Environment to prepare a Time Extension Notification (TEN) to the EU Commission in respect of our NO_2 exceedences of the limit value plus MOT in 2008. The evidence base used to support the NO_2 TEN application will be presented as soon as the documents are completed; it is not due in until after October 2010. Data provided

by the nitrogen dioxide diffusion tube network in the south district, especially around the Jumpers area, and the new monitoring station at Withams Road confirm that elevated nitrogen dioxide levels are as a result of emissions from the OESCO power station and the Inter Services Generating Station. Modelling carried out in the past also confirmed that these elevated levels are attributable to these power stations. It is expected that the closure of these stations in the near future will result in lower nitrogen dioxide levels, in compliance with the Directive. The closure of these two stations and the building of a modern and cleaner power station will form the basis of our TEN application.

Particulate matter (PM_{10}) daily and annual means in 2009 did not breach our national and European Limit Value following due apportionment of PM_{10} exceedences as a result of natural transboundary PM_{10} (ie Saharan dust). Work on the TEN application in respect of PM_{10} exceedences in Gibraltar entailed additional research that looked at the contribution to PM_{10} levels from sea salt, shipping generally, re-suspended dust, building works and traffic, amongst other things. Further information on Gibraltar's Time Extension Notifications is available on:- www.gibraltar.gov.gi/time-extension-notifications

The ratified data also showed that there were no exceedences of lead, cadmium, arsenic, nickel and Poly Aromatic Hydrocarbons (PAH).

Chapter 2:

Natural Resources

2.1 Bathing Water Quality

In the 1970's The European Commission decided that bathing water quality should be monitored and tested in order to protect bathers from health risks and to preserve the environment from pollution. This resulted in one of the first pieces of European environmental legislation: the Council Directive 76/160/EEC on Bathing Water Quality issued in 1976. This was transposed into local legislation by the Public Health (Quality of Bathing Water) Rules 1992.

The 1976 Bathing Water Directive sets binding standards for bathing waters throughout the European Union. The annual Bathing Water Report and Tourist Atlas can be viewed at http://ec.europa.eu/water/water-bathing/index_en.html

The 1976 Bathing Water Directive reflected the state of knowledge and experience of the early 1970s, both technically and socially. Since 1976, epidemiological knowledge has progressed and managerial methods have improved.

A new Bathing Water Directive (2006/7/EC) was adopted in 15th February 2006 and was transposed into local legislation by the Environment (Quality of Bathing Water) Regulations 2009.

The new Directive lays down provisions for more sophisticated monitoring and classification of bathing water. Directive 2006/7/EC requires Member States to draw up a management plan for each site to minimize risks to bathers, based on an assessment of the sources of contamination that are likely to affect it.

Information on a bathing site's quality classification, the results of water quality monitoring, the site's management plan and other relevant information is to be made readily available to the public, both through displays at the site and through the media and internet.

The classification of water quality at a bathing site will be determined on the basis of a three-year trend instead of a single year's result as at present. This means that the classification will be less susceptible to bad weather or one-off incidents. Where water quality is consistently good over a three-year period the frequency of sampling may be reduced.

Gibraltar has six bathing areas, Camp Bay, Catalan Bay, Eastern Beach, Little Bay, Sandy Bay and Western Beach. These areas are monitored on a fortnightly basis during 15th April to 30th

October each year compared for example to England and Wales that sample from 15th May to 30th September.

The Gibraltar beaches have always met the Mandatory Values and at least three of them have met the more stringent Guide Values consistently each year. Since 2003 all six sites have met the Guide Values. Below is a table of the results for the period 2000 – 2009.

GIBRALTAR

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1. Camp Bay	🔵	🔵	🔵	🔵	🔵	🔵	🔵	🔵	🔵	🔵
2. Catalan Bay	🟢	🟢	🟢	🔵	🔵	🔵	🔵	🔵	🔵	🟢
3. Eastern Beach	🟢	🟢	🟢	🟢	🔵	🔵	🔵	🔵	🔵	🟢
4. Little Bay	🔵	🔵	🔵	🔵	🔵	🔵	🔵	🔵	🔵	🟢
5.Sandy Bay	🟢	🟢	🟢	🔵	🔵	🔵	🔵	🔵	🔵	🟢
6.Western Beach	🔵	🔵	🔵	🔵	🔵	🔵	🔵	🔵	🔵	🔵

🔵 Meets Guide Values set by National legislation and EEC Directive 76/160/EEC

🟢 Meets Mandatory Values set by National legislation and EEC Directive 76/160/EEC

2.2 Potable Water Quality

The supply and quality of potable water in Gibraltar are controlled by the Public Health Act Part III.

The limit values and maximum advisable concentrations (MAC) for potable water is contained in the Schedules to the Public Health (Potable Water) Rules 1994 as amended by Public Health (Potable Water) Rules 1994 (Amendment) Rules 2001.

Water quality is checked under a two tier sampling and analysis programme:

(i) The water undertakers have their own "in house" water quality control programme. Samples are taken at the outlet of the production plant, batch storage reservoirs, service reservoirs and at the customer taps.

(ii) The Environmental Agency also carries out its own independent monitoring programme, sampling the water supplies as they reach the consumers. This programme is designed to meet the sampling criteria outlined in Directive 80/778/EEC as substituted by Directive 98/83/EC and our national legislation.

In 2009, AquaGib Ltd, (the local water undertaker) supplied a total of 1,359,030 cubic metres of potable water. The potable water consisted of 99.73% desalinated water and 0.27% well water.

The Public Health (Potable Water) Rules 1994 and the European Directive 98/83/EC require that both "Check" and "Audit" Monitoring is carried out on the potable water supplied to the community.

The purpose of the "Check" Monitoring is:

- to provide information on the organoleptic and microbiological quality of the water supplied for human consumption,
- to test the effectiveness of the drinking water treatment and;
- to determine whether or not the water complies with the relevant parametric values laid down by the Rules and the Directive.

The following parameters are included in the "Check" Monitoring list:

- Ammonium
- Colour
- Conductivity
- Escherichia coli (E.Coli)
- pH
- Odour
- Taste
- Coliform bacteria
- Turbidity.

The purpose of "Audit" monitoring is to determine whether or not the water complies with the relevant parametric values laid down by the Rules and the Directive.

The Rules and Directive require that a minimum of 16 "Check" and 3 "Audit" samples be undertaken in a given year. The Environmental Agency alone has taken and had analysed a total

of 146 "Check" and 5 "Audit" samples in 2009. This figure does not include the numerous samples also taken by AquaGib Ltd itself.

The following summary details the number of check and audit samples taken in Gibraltar. All samples complied with the standards.

Summary of information on drinking water quality 2009

Parameters (1)	Numbers of analyses	Numbers of analyses not complying	% of analyses complying
Microbiological Parameters			
Escherichia coli (E.coli)	143	0	100
Enterococci	9	0	100
Chemical Parameters			
Aluminium	5	0	100
Antimony	5	0	100
Arsenic	5	0	100
Benzene	5	0	100
Benso(a)pyrene	5	0	100
Boron	5	0	100
Bromate	5	0	100
Cadmium	5	0	100
Chromium	5	0	100
Colour[3]	151	0	100
Copper	5	0	100
Cyanide	5	0	100
1,2-dichloroethane	5	0	100
Fluoride	5	0	100
Iron	5	0	100
Lead	5	0	100
Manganese	5	0	100
Mercury	5	0	100
Nickel	5	0	100
Nitrate	5	0	100
Nitrite in distribution at the tap	5	0	100
Nitrate/nitrite formula[4]	5	0	100
Odours[3]	148	0	100
Pesticides-individual[2]	0	0	100
Pesticides – Total	55	0	100
Polycyclic Aromatic Hydrocarbons	20	0	100
Selenium	5	0	100
Sodium	5	0	100
Taste[3]	138	0	100
Tetrachloroethene and	5	0	100

Trichloroethene			
Trihalomethanes - Total	5	0	100

Indicator Parameters			
Ammonium	148	0	100
Chloride	148	0	100
Clostridium perfringens	0	0	100
Conductivity	148	0	100
Hydrogen Ion Concentration	148	0	100
Sulphate	5	0	100
Colony count 22_oC_3	0	0	100

2.3 Coastal Water Sampling

2.3.1. Water Framework Directive (WFD)

As part of Gibraltar's commitments under the Water framework Directive 2000/60/EC (WFD), numerous quality elements are being used to assess the water quality status of Gibraltar coastal waters. These quality elements include physical and chemical quality elements along with their respective environmental quality standards and biological quality elements (e.g. phytoplankton and benthic invertebrates). A comprehensive list of all the parameters that will be analysed following the collection of data throughout 2009 can be found in table 1 below. The classification of Gibraltar's coastal water quality status will be provided in the Gibraltar River Basin Management Plan due to be produced in 2010.

Table 1. List of parameters sampled as part of the Coastal water monitoring programme.

Chemical / physio-chemical parameters	Frequency
General	
Temperature*	Monthly
Nutrient status - Total N, Total P, NO3, NO2, NH4, PO4	Monthly
Salinity*	Monthly
Total suspended solids	Monthly
Dissolved Oxygen (DO)*	Monthly
Transparency*	Monthly
Chlorophyll-a*	Monthly

pH*	Monthly
Specific pollutants	
Priority substances	
Pesticides	
Alachlor	4 times per year
Atrazine	4 times per year
Chlorfenvinphos	4 times per year
Chlorpyrifos	4 times per year
Endosulfan (alpha-endosulfan)	4 times per year
Hexachlorobutadiene	4 times per year
Hexachlorocyclohexane	4 times per year
(gamma-isomer, Lindane)	4 times per year
Simazine	4 times per year
Trifluralin	4 times per year
Metals	
Cadmium and its compounds	4 times per year
Lead and its compounds	4 times per year
Mercury and its compounds	4 times per year
Nickel and its compounds	4 times per year
Polyaromatic hydrocarbons	
Anthracene	4 times per year
Fluoranthene	4 times per year
Naphthalene	4 times per year
(Benzo(a)pyrene)	4 times per year
(Benzo(b)fluoranthene)	4 times per year
(Benzo(g,h,i)perylene)	4 times per year
(Benzo(k)fluoranthene)	4 times per year
(Indeno(1,2,3-cd)pyrene)	4 times per year
Chlorinated Hydrocarbons	

1,2-Dichloroethane	4 times per year
Dichloromethane	4 times per year
Hexachlorobenzene	4 times per year
Pentachlorobenzene	4 times per year
Trichlorobenzenes (1,2,4-Trichlorobenzene)	4 times per year
Trichloromethane (Chloroform)	4 times per year
TBT	
Tributyltin compounds (Tributyltin-cation)	4 times per year
Other hydrocarbons	
C10-13-chloroalkanes	4 times per year
Benzene	4 times per year
BDEs	
Brominated diphenylethers	4 times per year
DEHP	
Di(2-ethylhexyl)phthalate	4 times per year
Urons	
Diuron	4 times per year
Isoproturon	4 times per year
Phenols	
Nonylphenols (4-(para)-nonylphenol)	4 times per year
Octylphenols (para-tert-octylphenol)	4 times per year
Pentachlorophenol	4 times per year
Other pollutants	
Chromium	4 times per year
Copper	4 times per year
Zinc	4 times per year
Biological parameters	
Phytoplankton - Abundance & composition (Abn. & Comp.)	4 times per year
Benthic macroinvertebrates - Abundance, composition & biomass	Every 6 years

2.3.2. Marine Strategy Framework Directive

In addition to the WFD, the monitoring requirements of the Marine Strategy Framework Directive 2008/56 (MSFD) will also be implemented in Gibraltar. The MSFD requires Member States to determine Good Environmental Status (GES) for their marine waters, and design and implement programmes of measures aimed at achieving it by 2020, using an *ecosystem approach* to marine management.

The Marine Strategy Framework Directive (MSFD) builds on and complements the Water Framework and Habitats Directives. Actions taken to comply with the Water Framework and Habitats Directives will thus help Gibraltar achieve GES for its marine waters. For example, measures taken under the Habitats Directive to protect the Southern Waters of Gibraltar will complement the MSFD considering that maintaining biodiversity is one of its objectives. The MSFD will however extend the requirement to maintain marine biodiversity throughout Gibraltar territorial waters.

Where the Marine and Water Framework Directives overlap – in coastal areas – the MSFD will require additional measures to address litter and noise. The MSFD will therefore build on the existing coastal monitoring programme developed by the Department of the Environment.

2.4. Marine habitats and species monitoring

The monitoring programme designed to assess the conservation status of the Southern Waters of Gibraltar marine Site of Community Importance, along with its constituent EU listed species and habitats, forms part of a wider monitoring strategy that has been implemented in line with the requirements of related EU Directives namely the Water Framework and Marine Strategy Framework Directives. These Directives are based on an ecosystem approach concerning the management and protection of coastal/marine ecosystems and therefore any data collected is being used to provide an accurate assessment of the general status of the Southern Waters of Gibraltar.

Within this holistic monitoring framework, the specific needs of the Habitats Directive, i.e. monitoring the conservation status of listed habitats and species, is being implemented but needs to be augmented. The monitoring programme will also cover other locally important marine species and communities not listed in the Habitats Directive since these play a critical role in maintaining the biodiversity and resilience of EU listed features e.g. reefs.

Chapter 3:

Waste Management

3.1 Background

Waste management remains a high priority for Gibraltar as it seeks to manage its waste locally in so far as is economically and technically feasible.

This chapter provides statistical information on Gibraltar's waste arisings as well as details of waste management policies currently in place.

3.2 Industrial Waste Arisings

Due to the absence of heavy industry in Gibraltar, the main sources of industrial waste are shipping, the Ministry of Defense (MOD), light industry and clinical/medical practices. A limited amount of hazardous material is also produced from municipal sources and via construction and demolition activities.

Industrial waste materials are stored locally until sufficient quantities have been amassed to warrant its transfrontier shipment. It predominantly consists of waste oils, asbestos and asbestos containing products. A detailed breakdown of locally produced hazardous wastes is given in Table 3.1.

Table 3.1 Breakdown of Industrial Waste Arisings 2009

Waste Totals	2009
GRIT BLASTING WASTE	123.41 MT
END OF LIFE TYRES	270.46 MT
DEVELOPER & FIXER FLUID	1283 kgs
WASTE PAINT & VARNISH WITH ORGANIC SOLVENTS	49.511 MT
WASTE OIL	14400m^3
BILGE OILS	5400m^3
LEAD BATTERIES	119.187 MT
DISCARDED ELECTRICAL & ELECTRONIC EQUIPMENT	53.92 MT
FLUORESCENT TUBES & OTHER MERCURY CONTAINING WASTE	2.3 MT
USED OIL FILTERS	7.02 MT
BITUMEN & BITUMEN PRODUCTS	193.16kgs
EARTH & STONES CONTAINING DANGEROUS SUBTANCES	529.9 MT

OIL & GREASE CONTAMINATED MATERIALS	70.7 MT
WASTE CONTAINING OIL	85.49 MT
FLY ASH CONTAINING DANGEROUS SUBSTANCES	9.76 MT
BOTTOM ASH & SLAG CONTAINING DANGEROUS SUBSTANCES	23.16 MT
ASBESTOS & DEBRIS WITH ASBESTOS CONTENT	183.46 MT
INSULATION MATERIALS CONTAINING ASBESTOS	14.82 MT
WASTES WHOSE COLLECTION & DISPOSAL IS NOT SUBJECT TO SPECIAL REQUIREMENTS IN ORDER TO PREVENT INFECTION.	226120 LTRS
ACID SOLUTIONS 06 01 06	5474 kgs
LAB CHEMICALS CONTAINING DANGEROUS SUBSTANCES, INCLUDING MIXTURES OF CHEMICALS (16 05 06)	2.413 MT
MIXED CONSTRUCTION & DEMOLITION WASTES OTHER THAN THOSE MENTION IN 17 09 01, 17 09 02 & 17 09 03	2484.87 MT
WASTE PLASTIC	32.44 MT
FIRE FIGHTING FOAM	1.2 MT
SOIL & STONES	75.18 MT

MT – Metric tones

M^3 – Cubic metres

3.2 Municipal Waste

Municipal waste in Gibraltar is collected by two different bodies, namely Gibraltar Industrial Cleaners and Master Service (Gib) Ltd. In 2009 the total amount of municipal waste collected and sent to Spain was 29,334.48 tonnes. This includes mattresses and bulky household items. Removing these from the total sum leaves 17,141.38 tonnes of household waste, which equates to approximately 580 kg of waste per person per annum. This figure still includes commercial waste from businesses, bars and restaurants, which goes some way towards explaining why it is significantly higher than the average figure for a developed European country (approximately 400kg per person per annum). It is to be hoped that as bars, restaurants and businesses embrace the recycling scheme, this figure will fall.

Table 3.2 Breakdown of Municipal Waste Arisings

Type of Waste	Amount of Waste (tonnes)
Bulky items	**12165.70**
Mattresses	**27.40**
Household refuse	**17141.38**
Total (TPA)	**29334.48**

3.3 Recycling

3.3.1 Glass & Cans

The recycling scheme for glass and cans has continued to meet with limited success. The green bins are for glass bottles, drinking glasses, tumblers and jars only. Metal lids and metal bottle tops should be deposited separately in the yellow bins. The yellow bins are only for the depositing of aluminium and steel drink cans, steel food tins, household aerosols and clean aluminium foil (as well as metal bottle tops and metal lids from glass bottles and jars). No other types of refuse should be deposited in these bins and the public is asked to give items a quick clean before depositing.

Figures are only marginally up on last year with 11,000 kg of waste cans and 87,550 kg of waste glass being collected for recycling.

3.3.2 Other waste materials

The recycling of other waste materials continues. Recyclable material from our municipal waste is manually and automatically separated and processed at the Los Barrios landfill site, Sur Europa. Further sorting and recycling of items is carried out locally; wood and metal items are sorted out at the previous incinerator site at Michael Dobinson Way. A separate Civic Amenities Site is operated by Gibraltar General Support Services Ltd and located at Buena Vista. At this site people can dispose of their bulky timber items, white goods and other electrical items, mattresses, building debris and metal scrap.

3.4 Clinical Waste

The Clinical Waste Incinerator provides the collection, transport & destruction services to all local Clinical and Medical Waste Producers (hospitals, clinics, laboratories, surgeries, dental and veterinary clinics). The collected wastes are incinerated at this installation which is situated at Governor's Cottage, Europa Advance Road.

2,771,760 litres of clinical waste were incinerated locally in 2009. A further 653,290 litres were exported to Spain. 60 Clinical Waste Sharps boxes were also incinerated during this year.

Chapter 4:

Energy

4.1 Background

Like every other nation in the world, Gibraltar faces a challenge when it comes to energy. Energy is vital to our economic growth, however, global increases in energy consumption have led to global problems in the form of climate change. Gibraltar is concentrating its efforts on reducing the amount of energy consumed in homes, businesses and public and leisure facilities by introducing energy efficiency measures throughout all sectors of society.

4.2 The Energy Performance of Buildings

The Energy Performance of Buildings Directive was transposed into local legislation via the Building (Energy Performance) Rules 2008 and subsequent Building (Energy Performance) (Amendment) Rules 2009. This legislation aims to reduce carbon emissions by reducing the amount of energy used in buildings. It sets out a number of requirements as follows:

- A methodology must be established for calculating the energy performance of a building
- Minimum energy performance standards must be set and applied to both new buildings and existing buildings undergoing major refurbishment
- A system of building certification must be created which makes energy consumption levels much more visible to owners, tenants and users of the building
- Regular inspections for air conditioning systems above certain minimum sizes must be carried out to verify their energy efficiency.

4.2.1 Establishing a methodology

In order to ensure that minimum energy performance standards are applied across the board, a methodology for the calculation of the energy performance of buildings has been developed. The Government contracted the UK Building Research Establishment to modify the UK National Calculation Methodology, which is the Simplified Building Energy Model, to make it specific to Gibraltar's circumstances in terms of climate conditions and construction methods. The model looks to provide consumers with a clear and comparable source of information on the energy use of a building. Buildings will be classified according to their type in order to allow meaningful comparison. The model takes into consideration aspects such as the thermal insulation, heating and cooling systems, natural ventilation and passive lighting and heating from the sun. Positive factors may include solar heating systems or combined heat and power installations.

4.2.2 Minimum Energy Performance Standards

In terms of energy performance standards, the Building Rules have been revised and amended to include a new Part F: Conservation of Fuel & Power. This effectively applies the equivalent standards to the 2002 England & Wales building regulations and constitutes a significant

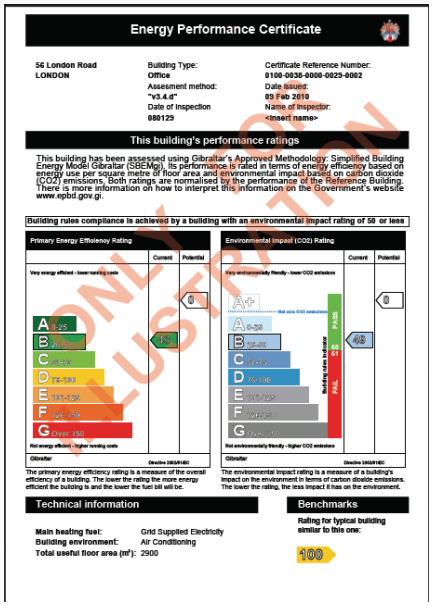
improvement to what previously existed. The standards apply to all new buildings and to existing buildings of more than 1000m^2 of useful floor undergoing major refurbishment. In Gibraltar, this means that any new or large refurbished building will have to obtain a CO_2 rating of 50 or less as calculated by the model SBEM-GI. If a new building fails to meet this standard it will not receive a certificate of fitness.

Furthermore, new buildings of more than 1000m^2 useful floor area will have to undergo a full feasibility assessment of alternative heating and energy supply systems before construction starts.

4.2.3 Energy Performance Certificates (EPCs)

Under the new legislation all buildings require an Energy Performance Certificate upon construction, sale or rental. These certificates can only be produced by accredited energy assessors, a list of whom can be found on the Government website. The certificate must be accompanied by a recommendations report which provides information on how to improve the energy performance of the building in question. In addition to all this, large public buildings will have to display their energy performance certificates in a prominent place within the building to help raise awareness of energy efficiency within the community.

A typical energy performance certificate looks like this:



Energy Performance Certificate

56 London Road
LONDON

Building Type: Office
Assesment method: "v3.4.d"
Date of Inspection 080129

Certificate Reference Number: 0100-0038-0000-0025-0002
Date issued: 09 Feb 2010
Name of inspector: <insert name>

This building's performance ratings

This building has been assessed using Gibraltar's Approved Methodology: Simplified Building Energy Model Gibraltar (SBEMg). Its performance is rated in terms of energy efficiency based on energy use per square metre of floor area and environmental impact based on carbon dioxide (CO_2) emissions. Both ratings are normalised by the performance of the Reference Building. There is more information on how to interpret this information on the Government's website www.epbd.gov.gi.

Building rules compliance is achieved by a building with an environmental impact rating of 50 or less

Primary Energy Efficiency Rating — Current: 0 — Potential: 0

Environmental Impact (CO_2) Rating — Current: 0 — Potential: 0

The primary energy efficiency rating is a measure of the overall efficiency of a building. The lower the rating the more energy efficient the building is and the lower the fuel bill will be.

The environmental impact rating is a measure of a building's impact on the environment in terms of carbon dioxide emissions. The lower the rating, the less impact it has on the environment.

Technical information

Main heating fuel: Grid Supplied Electricity
Building environment: Air Conditioning
Total useful floor area (m^2): 2900

Benchmarks

Rating for typical building similar to this one: 100

Typical energy use, CO2 emissions and fuel costs of this building

Based on standardised assumptions about occupancy and heating/cooling patterns, provides an indication of how much it will cost to provide energy, lighting, heating/air conditioning and hot water to this building. The fuel costs only take into account the cost of fuel and not any associated service, maintenance or safety inspection.
This certificate has been provided for comparative purposes only and enables comparison of buildings. Always check the issue date of the certificate as fuel prices can increase over time and energy saving recommendations will evolve.

	Current	Potential
Energy Use	231 kWh/m2 per year	0 kWh/m2 per year
Carbon Dioxide Emissions	168 kgCO2/m2 per year	0 kgCO2/m2 per year
Energy Cost	£71082 per year	£0 per year
Lighting	87 kWh/m2 per year	0 kWh/m2 per year
Heating	1 kWh/m2 per year	0 kWh/m2 per year
Hot Water	24 kWh/m2 per year	0 kWh/m2 per year
Air Conditioning	119 kWh/m2 per year	0 kWh/m2 per year

To see how this building can achieve its potential rating, please see the recommended measures contained in Report Reference Number: 0000-2090-0040-1000-0003

Administrative information

This is an energy Performance Certificate as defined in:
Assessment Software: <SBEM v3.4.d using calculation engine SBEM v3.4.d
Property Reference: PROP010000
Assessor Name: <insert name>
Assessor Number: EAQI0001
Employer/Trading Name: <insert Employer/Trading Name>
Employer/Trading Address: <insert Employer/Trading Address>
Issue Date: 09 Feb 2010
Valid Until: 08 Feb 2020 (unless superseded by a later certificate)
Related Party Disclosure:

For advice on how to take action to make this building more energy efficient call 20045769

4.2.4 Air Conditioning Inspections

The Government will establish a system of regular inspections of air conditioning systems. These inspections will apply to all air conditioning systems with an effective output of more than 12kW and will be carried out by suitably qualified professionals.

4.3 The Energy Efficiency Action Plan

Energy efficiency has been deemed the fastest and most cost effective way of achieving significant emissions reductions and the Government of Gibraltar, through the implementation of its Energy Efficiency Action Plan (EEAP), is committed to the introduction of energy efficiency policies across the residential, business, public, industrial and transport sectors.

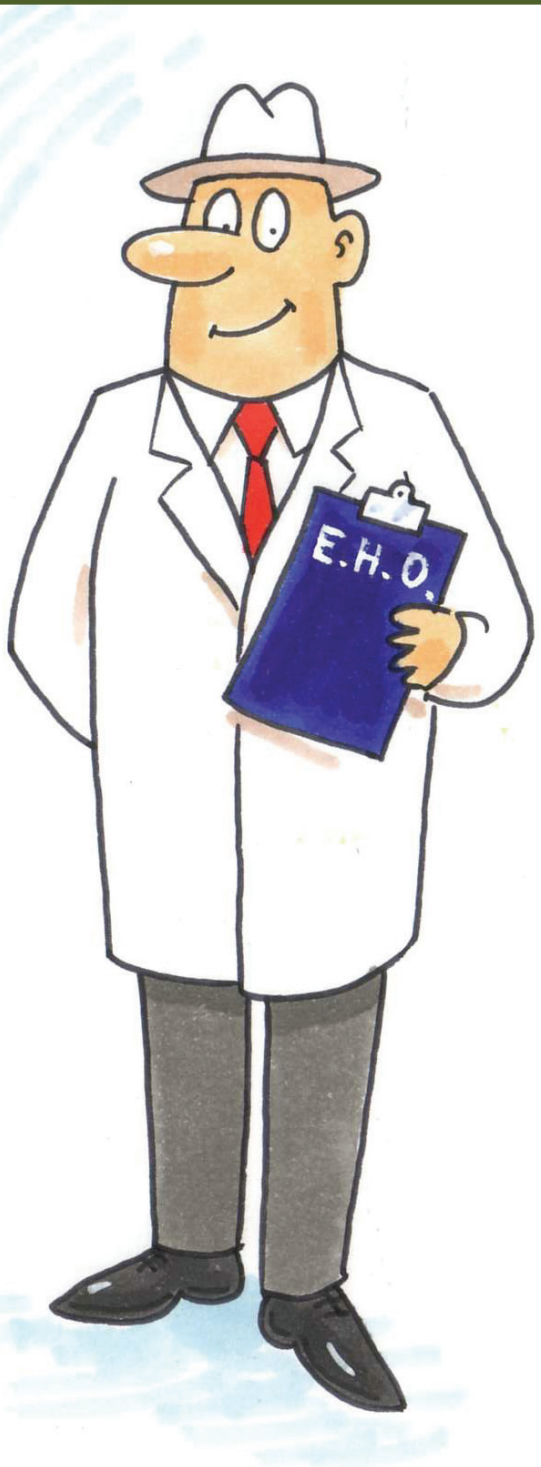
Specifically, Gibraltar's EEAP contains the following measures, amongst others:

- The establishment of an indicative energy savings target to be met by 2016
- The requirement for the public sector to fulfil an exemplary role in the promotion and development of energy end use efficiency
- The monitoring/overseeing of energy distributors, distribution system operators and retail energy sales companies to ensure the proper promotion of energy end use efficiency and energy services
- The creation of efficient, high quality, independent energy audit schemes
- The removal of any incentives in transmission and distribution tariffs that lead to unnecessary energy consumption

Further details of the plan can be found online at www.gibraltar.gov.gi/environment/environment.

Chapter 5:

Food Hygiene



5.1 Food Safety

Food safety is the absence of any risk of harm arising from the consumption of food. Generally speaking food safety describes the practice of managing food in such a way that the food is highly unlikely to cause any harmful effects to consumers. Food hygiene is the practical process that ensures that the food you make, serve or sell is perfectly safe to eat.

5.2 Food Poisoning

Contamination is the term that describes food in which there is a presence of something that is harmful or objectionable. Generally speaking if you eat contaminated food there is a strong likelihood that you will suffer from food poisoning. Food may become contaminated with physical objects, chemicals or harmful bacteria. The most common type of food poisoning in Gibraltar is caused by bacteria and it is referred to as bacterial food poisoning. The most common types of bacterial food poisoning in Gibraltar are caused by bacteria of the Salmonella and Campylobacter groups.

As part of their everyday duties Environmental Health Officers investigate food poisoning cases once they are reported to the Environmental Agency. The Environmental Health Officer conducts a thorough investigation to trace the source of infection. This normally entails visiting households, interviewing affected persons and offering precautionary advice to prevent the spread of further infection. Any food establishment associated with an outbreak is inspected immediately and a thorough investigation is carried out into the handling, storage, preparation and cooking of any suspect food to identify any malpractices which may have led to contamination. Food samples and health screening of food handlers may be carried out if deemed necessary.

5.3 Food Sampling Programme

Foods that normally give rise to bacterial food poisoning are those in which food poisoning bacteria can easily multiply and live. These foods are those that have high protein contents such as cooked meats, meat and poultry products and meals prepared with meat and poultry. These

foods are known as "high risk foods" and are sampled frequently by the Environmental Health Officers of the Environmental Agency to ensure that they are free from food poisoning bacteria.

Although priority is given to the sampling of the aforementioned foods, other foods are sampled to ensure that they comply with compositional standards set down in food additives legislation. A total of 330 samples of food were obtained and submitted for analysis in 2009.

5.4 Imported Food

The vast majority of food consumed locally is imported from countries worldwide via the land frontier with Spain. The Environmental Agency operates an inspection post at the border with Spain and all food imported is subject to inspections as necessary. A small amount of food is imported by shipping and this is also inspected by members of the Environmental Agency. The inspection service is supplemented by a routine and random sampling programme.

5.5 Registration & Inspection of Food Premises

There are 431 food premises in Gibraltar. These premises consist of restaurants, supermarkets, delicatessens, bakery, groceries and confectionery outlets. There are no manufacturing factories other than one soda bottling plant. The Environmental Agency works closely with developers and proprietors of new premises offering advice in their design and layout.

During 2009, 1024 inspection of food premises were done.

The Food and Drugs Act 1964 requires certain premises in which high risk foods are handled for sale to be registered by the Government. Registration is granted subject to the premises being fully compliant with our Food Hygiene Regulations.

All food premises are inspected by Environmental Health Officers to ensure that they comply with the Food Hygiene Regulations. The frequency of inspection is dependant on the risk categorisation of the premises. Premises in which high risk foods are sold are subjected to a more stringent inspection frequency than other premises.

The inspection of premises is carried out to identify risks arising from –

- The activities carried out and the effectiveness of the food business's own assessment and control of those risks
- Any contravention of the Food Hygiene Regulations and to seek to have them corrected.

Inspecting Officers discuss with the proprietor or representative all matters relating to hygiene systems and procedures.

5.6 Food Hygiene Training

Environmental Health Officers of the Agency deliver Food Safety training for persons employed in the catering, food retail, healthcare and service industries.

Every year several people in Gibraltar still suffer from the effects of food poisoning bacteria, with symptoms such as diarrhoea, nausea, vomiting and stomach cramps. Many of these people will have eaten food which has been contaminated by poor food hygiene practices during preparation, storage or cooking.

The importance of good food hygiene practices and procedures should not be underestimated. Employers have a legal obligation to comply with the Food Hygiene Regulations.

Training courses are accredited by the Chartered Institute of Environmental Health (CIEH) and all our trainers are approved by the CIEH. Courses have been re-designed to be more relevant to specific business environments and are suitable for anyone working where food is prepared, handled or cooked.

The range of courses currently delivered is as follows:

CIEH Level 1 in Food Safety Awareness in Catering & Retail

CIEH Level 2 in Food Safety in Catering & Retail

CIEH Level 3 Food Safety for Supervisors

During the year four courses were held at Level 1 with a total of 45 candidates; three courses at Level 2 with 29 candidates and one course at level 3 with 15 candidates.

Chapter 6:

Noise

6.1 Neighbourhood Noise

Noise is unwanted or harmful outdoor sound created by human activities. Noise is all around us and has its own particular effects on the quality of our environment and health. Noise pollution is on the increase due to our current lifestyles. Vehicles, motorcycles, aircraft, hi-fi systems, air conditioning units, construction, power generators etc all make a contribution to environmental noise.

6.2 Noise Complaints

We are all affected at one time or another by neighbourhood noise. It could be noise coming from some activity in your neighbour's home, businesses, vehicles, machinery in the street or construction activities. It is always sensible to talk to the person or company responsible for the noise and explain that you are being affected before making a formal complaint. You may find that in most cases they are not aware that they are disturbing you. If however your informal approach to the person or company producing the noise does not work you can complain officially to the Environmental Agency, the Royal Gibraltar Police or the Chief Secretary of the Gibraltar Government. The powers to act against different sources of neighbourhood noise are divided between these three authorities. The Royal Gibraltar Police, for example, deals with noise arising from motorcycles, music from vehicles, and licensed premises. The Environmental Agency deals mainly with noise arising from industrial and mechanical sources such as air-conditioning, refrigeration plants, construction sites and in certain circumstances loud music. The Chief Secretary of the Government of Gibraltar deals with noise arising from entertainment premises licensed in designated leisure areas. You can complain by contacting the aforementioned departments. If you are not sure which of these authorities you have to complain to, any of the three will advise you on where to direct your complaint.

6.2.1 What action can be taken?

The three authorities have powers to deal with noise under their jurisdiction in different manners, for example, the Royal Gibraltar Police have powers to report offenders, the Government's Chief Secretary has powers to impose conditions on licenses and the Environmental Agency has power to serve abatement notices to abate noise which is considered to be a nuisance.

NOISE COMPLAINTS RECEIVED BY THE ENVIRONMENTAL AGENCY IN 2009

Nature of Complaint	Number of reports
Noisy establishments	**17**
Industrial noise	**9**
Shipping noise	**0**
Construction noise	**12**
Noisy neighbours	**16**
Dogs	**2**
Miscellaneous	**5**
Alarms	**2**

Total: 63

Chapter 7

Public Awareness

7.1 Environmental Education & Public Awareness

Education, including formal education and public awareness, is critical for promoting sustainable development and improving people's capacity to address environmental issues. While basic education provides the underpinning for any environmental education, the latter needs to be incorporated as an essential part of learning. Formal and non-formal education is critical for the achievement of environmental and ethical awareness.

In recognition of this fact, the Department of the Environment continues to work in close collaboration with the Department of Education and schools to deliver relevant environmental messages to children. This year's environmental programme focused on the theme of biodiversity, looking at local biodiversity and highlighting its fundamental importance in achieving and maintaining our quality of life.

A well educated public is a vital tool in the fight against climate change and environmental damage. The Government of Gibraltar continues to invest in public awareness initiatives such as the publication of this annual report, the publication and dissemination of newsletters and focused information campaigns. The aim is to provide the whole community with the opportunity to acquire the awareness, knowledge, skills and commitment needed to protect and improve our environment. It is hoped that this increased awareness will in turn create new environmentally-friendly behavioural patterns and also promote effective public participation in environmental and development decision making processes.

Fig. 7.1 Some examples of the Department of the Environment's new awareness posters

7.2 World Environment Day 2009

World Environment Day, commemorated each year on 5 June, is one of the principal vehicles through which the United Nations Environment Programme (UNEP) stimulates worldwide awareness of the environment and enhances political attention and action.

Gibraltar, along with over 100 other countries around the globe, organised its own World Environment Day celebrations. The theme for this year was "Your Planet Needs You: Unite to Combat Climate Change", focusing on what is currently the biggest environmental threat to the planet, its broader consequences and what societies can do in response. It reflected the urgency for nations to agree on a new deal at the crucial climate convention meeting in Copenhagen some 180 days later in the year, and the links with overcoming poverty and improved management of forests.

The Department of the Environment spearheaded Gibraltar's participation on the day with the school programme focusing on spreading the environmental message via the medium of song and dance. Nine schools performed on the day with other schools celebrating the event in-house.