Department of the Environment and Climate Change
HM Government of Gibraltar

ANNUAL STATISTICS REPORT

2014

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Chapter 1: Air Quality

1.0 Introduction

The Gibraltar Air Quality Monitoring Programme consists of three automatic monitoring stations measuring a variety of pollutants; and a passive monitoring network measuring nitrogen dioxide and volatile organic compounds through the use of diffusive samplers. Providing disseminated results in near real-time at www.gibraltarairquality.gi, recordings of the highest quality assurance are accessible to the public leading to a high level of activity on the website in 2014 with an average of 429 visits, 194 unique visitors, and 1,267 page views per month.

Month	Number of Visits	Unique Visitors	Page Views
Jan-14	371	182	1,233
Feb-14	245	155	722
Mar-14	424	174	1,377
Apr-14	350	184	783
May-14	508	242	1,865
Jun-14	674	244	2,422
Jul-14	562	208	1,560
Aug-14	497	183	1,264
Sep-14	363	170	814
Oct-14	433	182	1,366
Nov-14	403	220	1,024
Dec-14	313	189	778

Table 1: Gibraltar Air Quality Hits for 2014

With the availability of past and present data collection, users are able to familiarize themselves with Gibraltar Ambient Air Quality Standards which have been transposed into local legislation from the latest Air Quality Directive 2008/50/EC (known as the CAFÉ Directive - Clean Air for Europe).

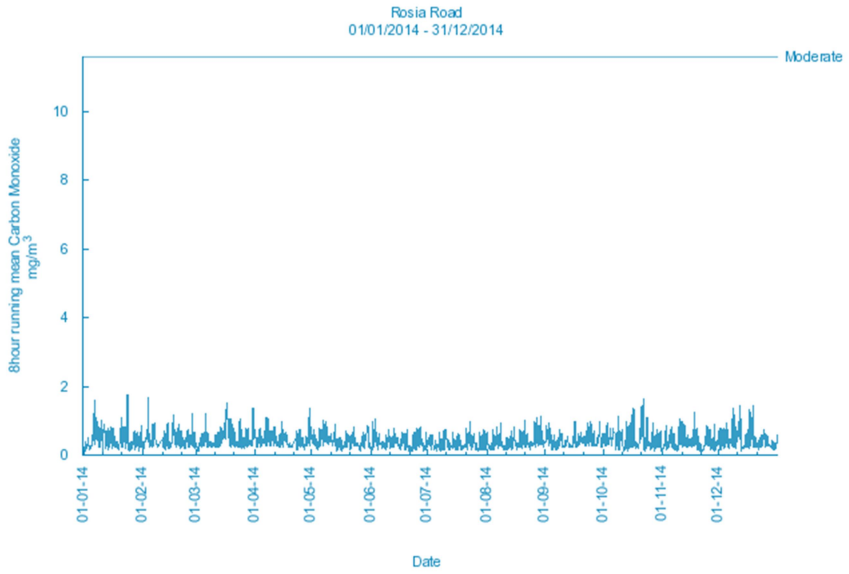
1.1 Annual Automatic Data Summary Reports

1.1.1 Rosia Road: 1st January to 31st December 2014

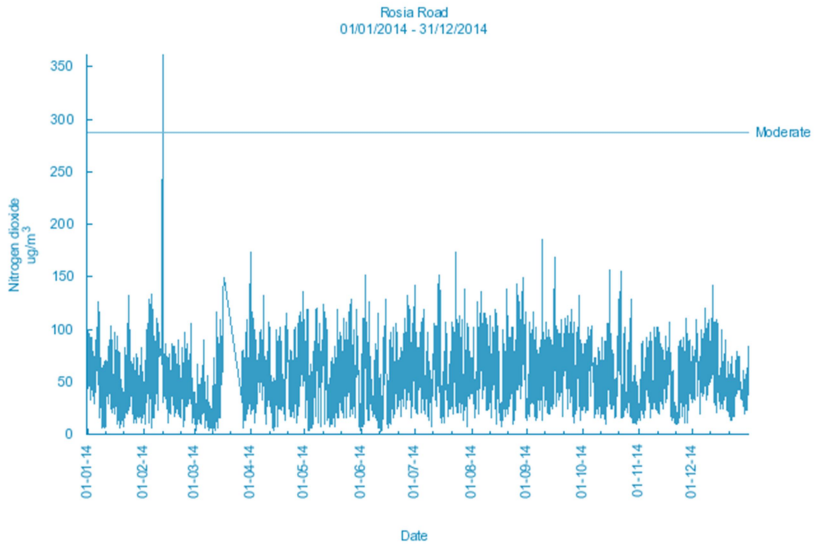
Rosia Road automatic monitoring station, situated on a busy roadside close to the South District Power Station, experienced the following levels of pollutant activity throughout 2014.

POLLUTANT	BENZ	CO	NO_2	SO_2
Maximum hourly mean	32.0 µg m^{-3}	4.1 µg m^{-3}	361 µg m^{-3}	117 µg m^{-3}
Maximum running 8-hour mean	10.3 µg m^{-3}	1.8 µg m^{-3}	184 µg m^{-3}	53 µg m^{-3}
Maximum running 24-hour mean	5.3 µg m^{-3}	1.0 µg m^{-3}	117 µg m^{-3}	31 µg m^{-3}
Maximum daily mean	4.7 µg m^{-3}	1.0 µg m^{-3}	96 µg m^{-3}	31 µg m^{-3}
Average	1.5 µg m^{-3}	0.4 µg m^{-3}	54 µg m^{-3}	10 µg m^{-3}
Data capture	86 %	97 %	94 %	97 %

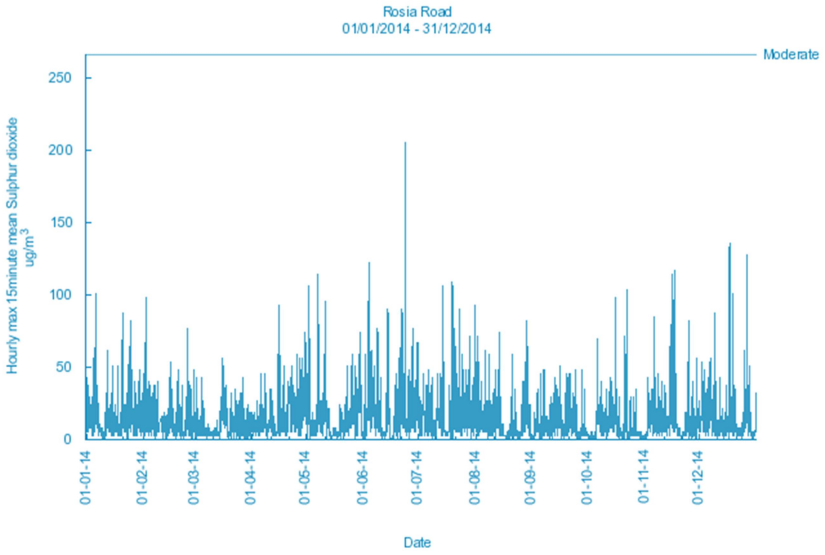
Table 2: Rosia Road monitored results 2014



Graph 1: Hourly Mean Data for 1st January to 31st December 2014 of CO



Graph 2: Hourly Mean Data for 1st January to 31st December 2014 of NO_2



Graph 3: Hourly Mean Data for 1st January to 31st December 2014 of SO_2

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedances
Carbon Monoxide	Running 8-hour mean > 10.0 mg m^{-3}	0
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	2
Sulphur Dioxide	Annual mean > 20 µg m^{-3}	0

Table 3: Rosia Road pollutant exceedances for 2014

The results show that there has been an overall improvement in pollutant concentrations at this location. Carbon monoxide and sulphur dioxide, again recorded no exceedances during this time. In reference to benzene and carbon monoxide, recordings showed a marked reduction in their maximum running 8-hr mean, maximum running 24-hr mean, and maximum hourly mean. In respect of nitrogen dioxide, results show that there continued to be exceedances of thresholds, however, these were fewer than in 2013. This could be as a result of policy decisions made by H.M. Government to reduce the number of operating hours of the South District Power Station throughout the year when it is possible to do so. Table 4 below shows the total number of actual running hours during 2014 which shows a marked reduction by the end of the year, despite monthly fluctuations which are to be expected.

Month	Number of Hours
January	2463.07
February	2143.9
March	1518.08
April	1860.21
May	3177.96
June	3242.44
July	3074.15
August	2581.12
September	2552.49
October	2549.71
November	1919.89
December	1940.27

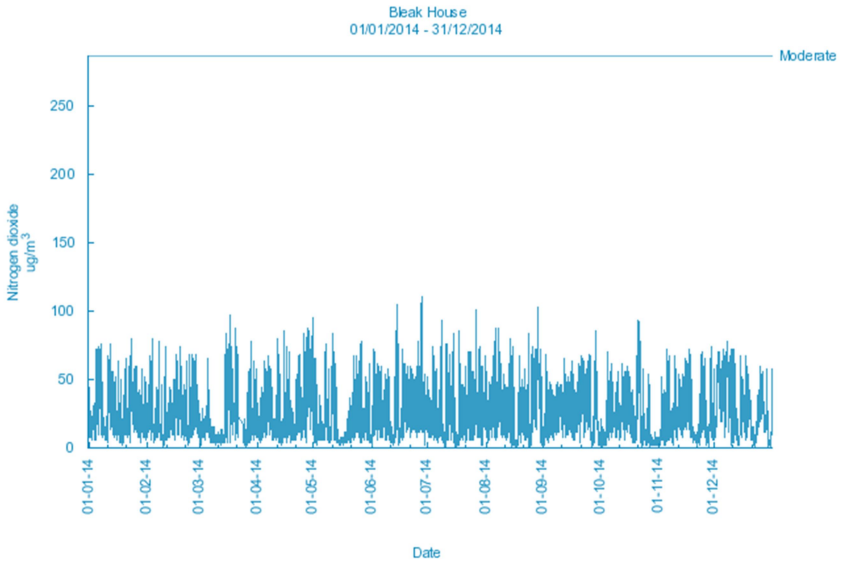
Table 4: South District Power Station running hours in 2014

1.1.2 Bleak House: 1st January to 31st December 2014

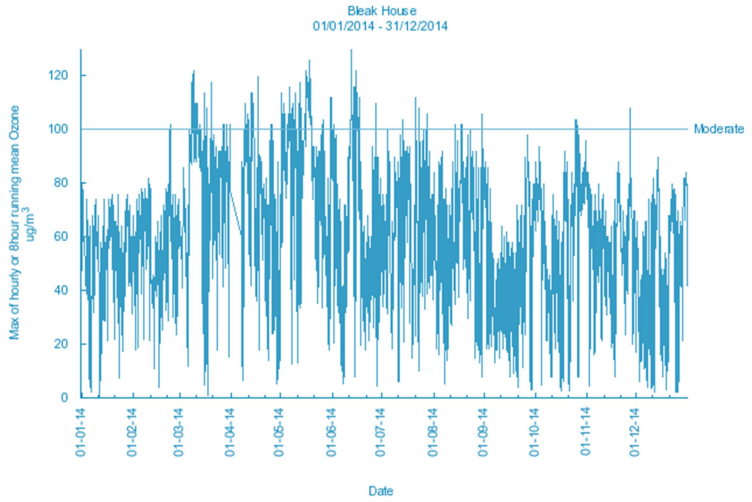
Representing pollutant levels for a suburban setting in Gibraltar, data collected during 2014 at Bleak House were as follows.

POLLUTANT	NO_2	O_3
Maximum hourly mean	110 µg m^{-3}	129 µg m^{-3}
Maximum running 8-hour mean	91 µg m^{-3}	122 µg m^{-3}
Maximum running 24-hour mean	67 µg m^{-3}	114 µg m^{-3}
Maximum daily mean	57 µg m^{-3}	112 µg m^{-3}
Average	24 µg m^{-3}	53 µg m^{-3}
Data capture	98 %	97 %

Table 5: Bleak house monitored results 2014



Graph 4: Hourly Mean Data for 1st January to 31st December 2014 of NO_2



Graph 5: Hourly Mean Data for 1st January to 31st December 2014 of Ozone.

Pollutant	Public Health (Air Quality Limit Values) Rules 2002, (Amendment) Rules 2003 and (Ozone) Rules 2004	Exceedances
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0
Ozone	Running 8-hour mean > 120 µg m^{-3}	2

Table 6: Bleak House pollutant exceedances for 2014

Bleak House experienced no exceedances in nitrogen dioxide pollution – reflecting the fact that it is located away from the power stations and busy traffic areas - but highs in ozone with a total of 2 exceedances experienced in 2014. Ozone is formed by the sunlight-initiated oxidation of volatile organic compounds (VOCs) in the presence of nitrogen oxides (NOx). This pollutant is not emitted locally and is created from ozone precursors that are predominantly of a transboundary nature. As a result of the transboundary nature of this pollutant, the problem of ozone pollution is currently being tackled through international agreements on precursor pollutants rather than by EU threshold exceedance infractions.

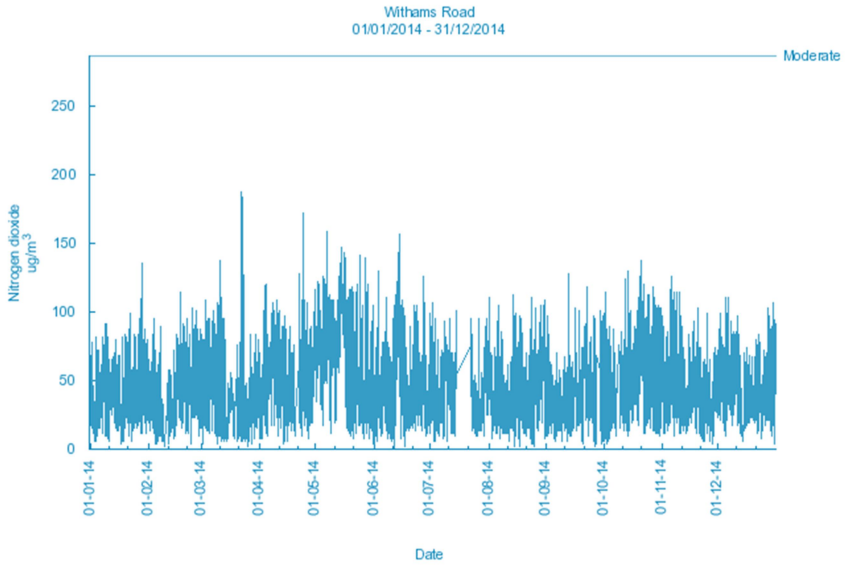
1.1.3 Witham's Road: 1st January to 31st December 2014

Located in the vicinity of the South District and GMES power stations, Witham's Road monitoring station was placed here to closely monitor the effect of traffic and emissions from the power stations. Regulated since 2008, data for 2014 revealed the following.

POLLUTANT	NO_2
Maximum hourly mean	187 µg m^{-3}
Maximum running 8-hour mean	145 µg m^{-3}
Maximum running 24-hour mean	112 µg m^{-3}
Maximum daily mean	105 µg m^{-3}

Average	46 µg m^{-3}
Data capture	95 %

Table 7: Witham's Road monitored results 2014



Graph 6: Hourly Mean Data for 1st January to 31st December 2014 of NO_2

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

Table 8: Witham's Road pollutant exceedances for 2014

As last year there were no exceedances experienced in the hourly mean for nitrogen dioxide and an overall reduction of 3 µg m^{-3} was recorded in the pollutant's annual mean. Despite this, increases were noted in the maximum hourly mean, maximum running 8-hr mean, and maximum running 24-hr mean of this pollutant.

1.2 Overview of Gibraltar's automatic air pollution measurement

As part of an effective air quality monitoring regime, it is crucial to obtain substantial data capture to ensure greater accuracy of results. Table 9 below compares the total percentage of data capture collected in UK and Gibraltar.

Site	CO	PM10	GR25	NO2	O3	SO2
Number of Sites	7	74	81	127	80	29
Number of sites < 85 %	1	27	28	33	7	5
Number of sites < 90%	1	36	40	39	13	8
Network Mean (%) (UK)	91.9	81.3	84.5	86.2	94.0	91.9

Gibraltar network mean (%)	97.0	86.3	89.0	95.7	97.0	97.0

Table 9: Data Capture for 2014 (%)

Gibraltar established a higher level of data capture than the UK, strengthening the reliability of results presented.

1.2.1 Compliance with Air Quality Limit Values

To ensure compliance with air quality objectives and legislative limit values, it is necessary to cross-examine gathered data with these policies. Within this section, pollutants from the automatic monitoring framework [carbon monoxide, nitrogen dioxide, sulphur dioxide, benzene and ozone] will be evaluated, with failures to meet standards highlighted in red, and compliant values highlighted in green.

Air quality objective for CO (as maximum daily running 8hr mean)	Recorded levels (as maximum daily running 8hr mean)
10 mg m^{-3}	**1.8 mg m^{-3}**

Table 10: Automatic measurement of Carbon Monoxide in 2014

Air Quality Objective for NO_2	Recorded Annual Mean
40 µg m^{-3}	**54 µg m^{-3} (Rosia Road)** **46 µg m^{-3} (Witham's Road)** **24 µg m^{-3} (Bleak House)**

Table 11: Recorded annual means for Nitrogen Dioxide in 2014

Air Quality Objective for NO_2 (1 hour mean)	Recorded 1 hour mean
200 µg m^{-3} not to be exceeded more than 18 times per year	**361 µg m^{-3} (Rosia Road)** **Target value exceeded on 2 days** **187 µg m^{-3} (Witham's Road)** **110 µg m^{-3} (Bleak House)**

Table 12: Recorded one hour mean for Nitrogen Dioxide in 2014

Air Quality Objective for SO_2 (Daily Mean)	Recorded Daily Mean
125 µg m^{-3} not to be exceeded more than 3 times per year	**31 µg m^{-3}**
350 µg m^{-3} not to be exceeded more than 24 times per year	**117 µg m^{-3}**

Table 13: Recorded Daily mean for Sulphur Dioxide in 2014

Air Quality Objective for Benzene (Annual Mean)	Recorded Annual Mean
5 µg m^{-3}	**1.5 µg m^{-3}**

Table 14: Recorded annual mean for Benzene in 2014

Air Quality Objective for Ozone (Maximum Daily 8 Hour Mean)	Maximum rolling 8-hr mean (µg m-3)
120 µg m^{-3} not to be exceeded more than 25 days per calendar year, averaged over 3 years.	**122 µg m^{-3}** **Target value exceeded on 2 days**

Table 15: Maximum rolling 8-hr mean for Ozone in 2014

All pollutants monitored under this network were successful in adhering to thresholds except NO_2 recordings at Rosia Road and Witham's Road. Exceeding air quality objectives by between 6 and14 µg m^{-3}, these results are likely to be a consequence of the South District power station which is in close proximity; compounded by the high levels of traffic and possibly redevelopment projects being carried out in the immediate and surrounding area during this time.

1.3 Review of Gibraltar's non-automatic air pollution measurements

When monitoring the presence of other pollutants such as particulate matters and metals; gravimetric filter samplers are used. These are assessed against limit values and objectives. For the purposes of this report, data has been provided for lead, PM_{10} and $PM_{2.5}$ and compliance will be highlighted in green, with failures highlighted in red.

1.3.1 Lead

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

Table 16: Recorded annual mean for Lead in 2014

Reviewing lead results for 2014, it can be seen that there was no exceedance of the lead annual mean objective and remained the same as the previous year.

1.3.2 Particulate Matter (PM_{10})

Air Quality Objective for PM_{10} (measured as an annual mean)	Recorded Annual Mean
40 µg m^{-3}	**36 µg m^{-3}**

Air Quality Objective for PM_{10} (measured as a daily mean)	No. of exceedances of maximum daily mean
50 µg m^{-3} not to be exceeded more than 35 times in a year	**17**

Table 17: PM_{10} recorded annual mean and compliance, 2014

	2007	2008	2009	2010	2011	2012	2013	2014
% Data Capture	99	90	98	95	85	90	73	82
Annual Mean PM_{10} (40 µg m^{-3})*	45	41	38.2	40.6	34	34	36	36
Max. 24-hour mean PM_{10}	249.8	179	79	130	65	83	88	155
Days > 50 µg m^{-3} (35 day limit)*	109	63	37	64	25	18	15	17

Table 18: Breakdown of PM_{10} statistics for Rosia Road

There are two air quality objectives set for PM_{10}; a daily mean objective not to be exceeded more than 35 times in a year, and an annual mean objective. Tables 17 and 18 show that 2014 recordings were compliant with both objectives and minor fluctuations from 2013 occurred.

1.3.3 Particulate Matter ($PM_{2.5}$)

Air Quality Objective for $PM_{2.5}$ (measured as an annual mean)	Recorded Annual Mean
20µg m^{-3}	**15µg m^{-3}**

Table 19: $PM_{2.5}$ recorded annual mean for 2014

In accordance with Part 4 of the Environment (Air Quality Standards) Regulations 2011, $PM_{2.5}$ currently has an annual mean exposure objective of 20µg m^{-3}. In 2014, the average measured concentration was 15µg m^{-3} meaning this was compliant with the regulations.

1.3.4 Arsenic, Cadmium, Nickel & Poly Aromatic Hydrocarbons (measured as Benzo(a)pyrene)

Pollutant	Parameter	Target Value	Recorded Average
Arsenic	Annual average	6 ng m^{-3}	**0.62 ng m^{-3}**
Cadmium	Annual average	5 ng m^{-3}	**0.15 ng m^{-3}**
Nickel	Annual average	20 ng m^{-3}	**33.43 ng m^{-3}**
BAP	Annual average	1 ng m^{-3}	**0.09 ng m^{-3}**

Table 20: 4th Daughter Directive pollutant recordings for 2014

The annual recorded averages for arsenic, cadmium, and poly aromatic hydrocarbons all fell well below their corresponding targets. With Nickel, however, the target value was exceeded by 13.43 ng m^{-3}. Due to the historically high regional levels of nickel in the Gibraltar Bay area and the wider region it has not been possible to apportion the source or the cause for the nickel exceedances. Further research on this pollutant is currently being undertaken by the Department of the Environment and Climate Change together with air quality experts. A reduction in concentration, however, was noted since 2013.

1.3 Diffusion Tube Networks

Non-automatic sites measure monthly average concentrations of NO_2 and/or benzene using a passive, diffusion tube based method. A simple and cost-effective method of monitoring air quality in an area, tubes are analysed by laboratories that offer quality assurance and control measures to ensure results accuracy.

1.3.1 Summary of Hydrocarbon Results

Site ID	Site Name	2005-2013 benzene average conc. (µg m-3)	2014 benzene conc. (µg m-3)	Difference
GIB1	Rosia Road	1.95	1.6	-0.3
GIB15	Catalan Bay Road	0.98	0.7	-0.3
GIB16	Laguna Estate	1.28	0.9	-0.4
GIB17	Kings Lines Fuel Depot	1.41	0.9	-0.5
GIB18	Moorish Castle Estate	1.19	1.2	0
GIB19	North Mole	1.76	1	-0.8
GIB2	Bleak House	0.87	0.6	-0.3
GIB20	Sundial Roundabout	2.0875	1.8	-0.3
GIB21	Anchorage Rosia Road	1.25	1	-0.2
GIB3	Jumper's	1.79	1.4	-0.4
GIB30	Governor's Meadow House	1.15	1.1	0
GIB4	Devil's Tower Road	1.61	0.6	-1
GIB5	Glacis Road	2.22	1.7	-0.5
GIB6	Queensway	2.04	1.3	-0.7
GIB7	Harbour Views	1.39	0.9	-0.5

Table 21: Average hydrocarbon concentrations for benzene in 2014

The pollutant threshold for benzene is 5 µg m^{-3}. Table 21 shows 2014 recordings collected at relevant sites and compares them to the cumulative average of previous years to identify progress over time. The results show that at no point was the threshold reached throughout the year and a

marked reduction was achieved in areas like North Mole, with levels stabilizing in other areas like Governor's Meadow House.

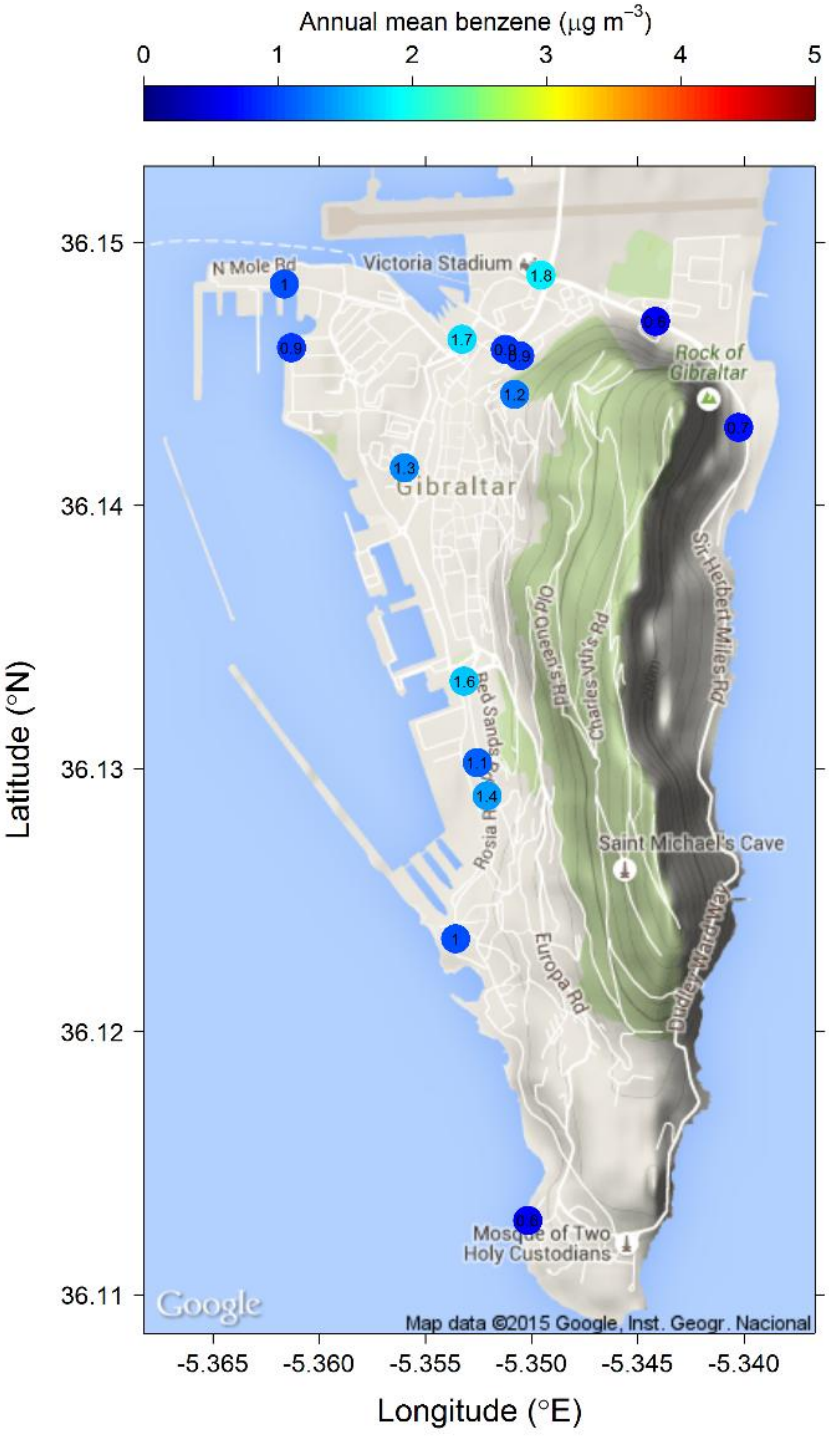


Figure 1: Benzene annual average concentrations for 2014

Like in 2013, the highest readings for benzene were recorded at Glacis Road at 1.7µg m^{-3} which is likely to be as a result of the high traffic and congestion typical to the area. 2014 showed that locations with the lowest readings were Devil's Tower Road and Bleak House at 0.6 µg m^{-3}.

1.3.2 Nitrogen Dioxide Network

Site ID	Site Name	2005-2013 NO_2 average conc. (µg m-3)	2014 NO_2 conc. (µg m-3)	Difference
GIB1	Rosia Road	44.4	53	8.6
GIB10	South Barracks Road	57	63	6
GIB11	Main Street	36.3	45	8.7
GIB12	Water Gardens	46.2	61	14.8
GIB13	George Don House	40.9	51	10.1
GIB14	Prince Edwards Road	43.3	56	12.7
GIB2	Bleak House	25.8	24	-1.8
GIB20	Sundial Winston Churchill Avenue Roundabout	53.125	60	6.9
GIB21	Anchorage Rosia Road	50.5	59	8.5
GIB22	Rosia Promenade	46.875	59	12.1
GIB23	Lathbury Industrial Park	25.375	23	-2.4
GIB24	Upper Withams Entrance	54.625	56	1.4
GIB25	Churchill House Withams Road	58.75	58	-0.8
GIB26	Open Air Theatre Alameda Gardens	38.75	41	2.2
GIB27	Alameda Gardens Main Access Road	37.75	41	3.2
GIB28	Rock Hotel	52.625	58	5.4
GIB29	Gardiners Road	38.625	46	7.4
GIB3	Jumper's	60.4	65	4.6
GIB30	Governor's Meadow House	51.375	56	4.6
GIB31	Dockyard Road	55.5	60	4.5
GIB32	Woodford Cottage Europa	54.5	58	3.5
GIB4	Devil's Tower Road	45.5	43	-2.5
GIB5	Glacis Road	54.1	66	11.9
GIB6	Queensway	39.6	55	15.4
GIB7	Harbour Views	37.5	49	11.5
GIB8	Red Sands Road	48.11111111	55	6.9
GIB9	Lime Kiln Road	41.9	50	8.1

Table 22: Average nitrogen dioxide concentrations in 2014

An increase in nitrogen levels at the majority of sites was experienced with places like Watergardens and Prince Edward's Road demonstrating the greatest rise. Despite this, Glacis Road continues to record the highest annual levels of nitrogen dioxide with a recording of 66 µg m^{-3} which is well above the air quality objective thresholds. Bleak House has experienced the greatest decrease in nitrogen

dioxide levels in 2014 compared to previous years; however, Lathbury Industrial Park recorded the lowest overall annual level for 2014 at 23 µg m^{-3}.

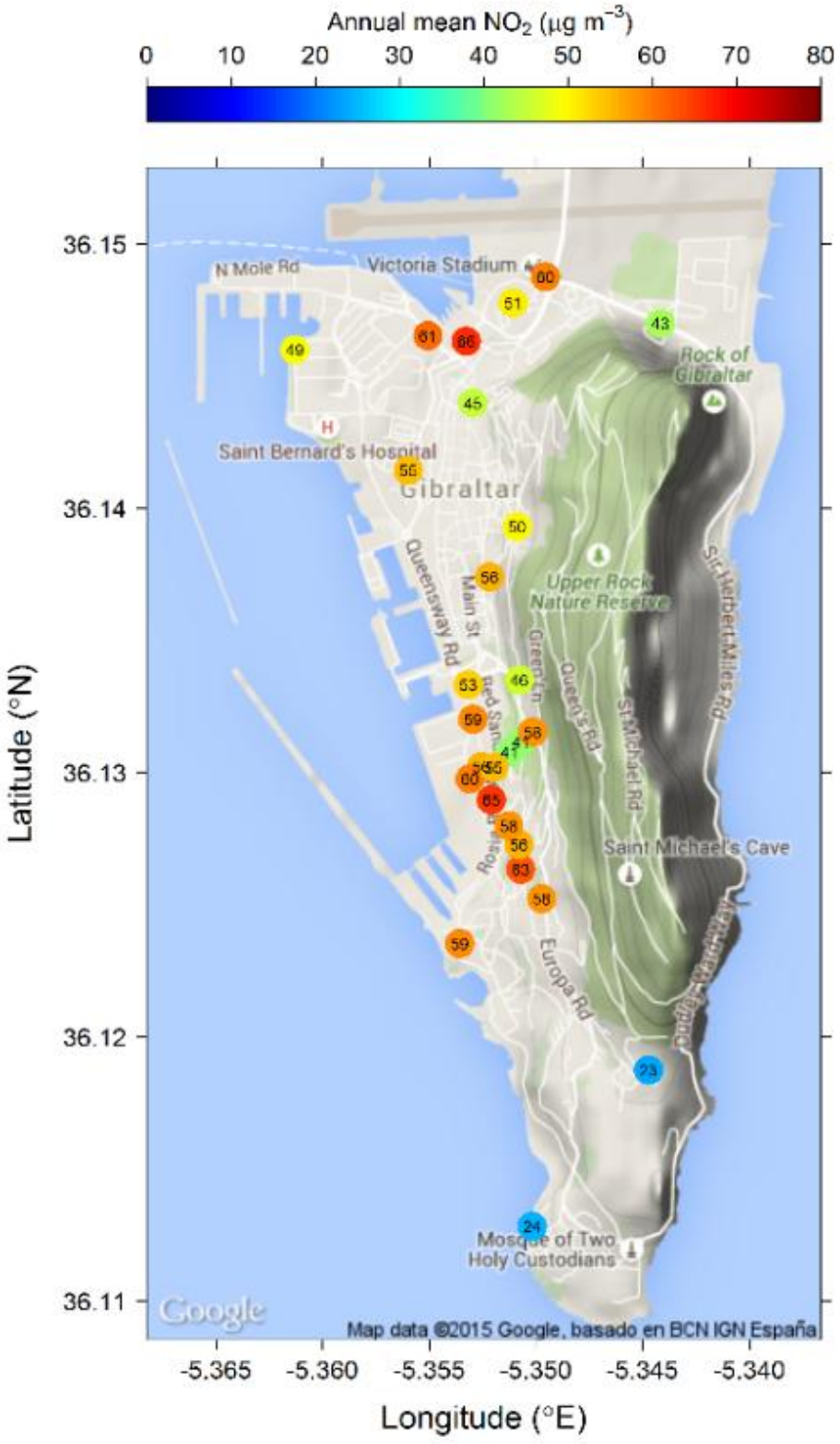


Figure 2: Nitrogen dioxide annual average concentrations for 2014

Chapter 2: Natural Resources

2.0 Bathing waters

In accordance with Gibraltar's weekly commitment to carry out sampling and monitoring of its six bathing areas - Camp Bay, Catalan Bay, Eastern Beach, Little Bay, Sandy Bay and Western Beach – the total number of samples taken in 2014 across all locations were 450.

Name	No of samples
Camp Bay	**50**
Catalan Bay	**50**
Eastern Beach	**49**
Little Bay	**50**
Sandy Bay	**50**
Western Beach	**136**
Berth 12 (GASA)	**26**
Rosia Bay	**39**

Table 23: Bathing Water samples taken in 2014

Samples gathered are subjected to laboratory analysis to determine the quality of these bathing waters and evaluate whether they are in compliance with EU bathing water quality standards (EEC Directive 76/160/EEC). Categorized into mandatory and guideline values, standards provide member states with figures which they should aspire to achieving, and compulsory figures that have to be met. The monitoring regime is set to change in 2015 with the guide values becoming mandatory. The following series of tables sets out the results of bathing water samples during 2015.

Camp Bay			
Date: 2014	**TOTAL COLIFORMS/100ml**	**E.COLI /100ml**	**FAECAL STREPTOCCUS /100ml**
MANDATORY STANDARD	10,000/100ml	2000/100ml	none
GUIDE VALUES	500/100ml	100/100ml	100/100ml
Failed Mandatory	0	0	0
Failed Guide	1	4	3

Catalan Bay			
Date: 2014	TOTAL COLIFORMS/100ml	E.COLI /100ml	FAECAL STREPTOCCUS /100ml
MANDATORY STANDARD	10,000/100ml	2000/100ml	none
GUIDE VALUES	500/100ml	100/100ml	100/100ml
Failed Mandatory	0	0	0
Failed Guide	3	8	7

Eastern Beach			
Date: 2014	TOTAL COLIFORMS/100ml	E.COLI /100ml	FAECAL STREPTOCCUS /100ml
MANDATORY STANDARD	10,000/100ml	2000/100ml	none
GUIDE VALUES	500/100ml	100/100ml	100/100ml
Failed Mandatory	0	0	0
Failed Guide	2	2	1

Little Bay			
Date: 2014	TOTAL COLIFORMS/100ml	E.COLI /100ml	FAECAL STREPTOCCUS /100ml
MANDATORY STANDARD	10,000/100ml	2000/100ml	none
GUIDE VALUES	500/100ml	100/100ml	100/100ml
Failed Mandatory	0	0	0
Failed Guide	1	2	3

Sandy Bay			
Date: 2014	TOTAL COLIFORMS/100ml	E.COLI /100ml	FAECAL STREPTOCCUS /100ml
MANDATORY STANDARD	10,000/100ml	2000/100ml	none
GUIDE VALUES	500/100ml	100/100ml	100/100ml
Failed Mandatory	0	0	0
Failed Guide	7	17	14

Western Beach			
Date: 2014	TOTAL COLIFORMS/100ml	E.COLI /100ml	FAECAL STREPTOCCUS /100ml
MANDATORY STANDARD	10,000/100ml	2000/100ml	none
GUIDE VALUES	500/100ml	100/100ml	100/100ml
Failed Mandatory	88	120	0
Failed Guide	256	287	205

Bathing Pavilion Europort Avenue			
Date: 2014	TOTAL COLIFORMS/100ml	E.COLI /100ml	FAECAL STREPTOCCUS /100ml
MANDATORY STANDARD	10,000/100ml	2000/100ml	none
GUIDE VALUES	500/100ml	100/100ml	100/100ml
Failed Mandatory	0	0	0
Failed Guide	0	2	2

Tables (24-30): Bathing Water Quality Values for all beaches.

All beaches except for Western beach successfully met mandatory values set by national legislation and EEC Directive 76/160/EEC. Western beach continues to show deterioration in bathing water quality as a result of discharges from a storm drain maintained by the municipal authorities in Spain, which services La Linea. This drain acts as a combined sewage/storm water overflow that discharges into the area adjacent to Western Beach.

2.1 Potable Water Supply

As is routine, in 2014 a two-tier sampling and analysis programme was carried out by the local Environmental Agency and AquaGib Ltd using their own specific methodology to assess the following parameters of potable water;

The total numbers of samples taken in 2014 of the above named parameters are set out in the table below.

Member State United kingdom (Gibraltar)

Year	2014				
Parameter	**Numbers of WSZ Monitored**	**Numbers of WSZ with Non-Compliance**	**Number of Analyses**	**Number of Analyses not complying**	**% of Analyses Complying**
Microbiological Parameters					
Escherichia (E.coli)	1	0	8	0	100
Enterococci	1	0	8	0	100
Chemical Parameters					
Antimony	1	0	8	0	100
Arsenic	1	0	8	0	100
Benzene	1	0	8	0	100
Benzo(a)pyrene	1	0	8	0	100
Boron	1	0	8	0	100
Bromate	1	1	8	1	87.5
Cadmium	1	0	8	0	100
Chromium	1	0	8	0	100
Copper	1	0	8	0	100
Cyanide	1	0	8	0	100
1,2-dichloroethane	1	0	8	0	100

Fluoride	1	0	8	0	100
Lead	1	0	8	0	100
Mercury	1	0	8	0	100
Nickel	1	0	8	0	100
Nitrite in distribution at the tap	1	0	8	0	100
Nitrate/nitrite formula$_3$	1	0	8	0	100
Pesticides – total	1	0	8	0	100
Polycyclic Aromatic Hydrocarbons	1	0	8	0	100
Selenium	1	0	8	0	100
Tetrachloroethane	1	0	8	0	100
and Trichloroethane	1	0	8	0	100
Trihalomethanes - Total	1	0	8	0	100
Indicator Parameters					
Aluminium	1	0	8	0	100
Ammonium	1	0	8	0	100
Chloride	1	0	8	0	100
Colour	1	0	8	0	100
Conductivity	1	0	8	0	100
pH	1	0	8	0	100
Iron	1	0	8	0	100
Manganese	1	0	8	0	100
Odour	1	0	8	0	100
Oxidisability	1	0	8	0	100
Sulphate	1	0	8	0	100
Sodium	1	0	8	0	100
Taste	1	0	8	0	100
Coliform	1	0	8	0	100
Turbidity	1	0	8	0	100

Table 31: National summary information on drinking water quality in water supply zones exceeding 1000 m^3 per day as an average or serving more than 5000 persons

2.2 Coastal Water Monitoring

In order to comply with the requirements of the Water Framework Directive (WFD) 2000/60/EC, H.M. Department of the Environment and Climate Change carry out a coastal water monitoring programme which consists of four core sites and four additional investigative sites; two of which are located within the harbour, and two of which are located on the east side of Gibraltar.

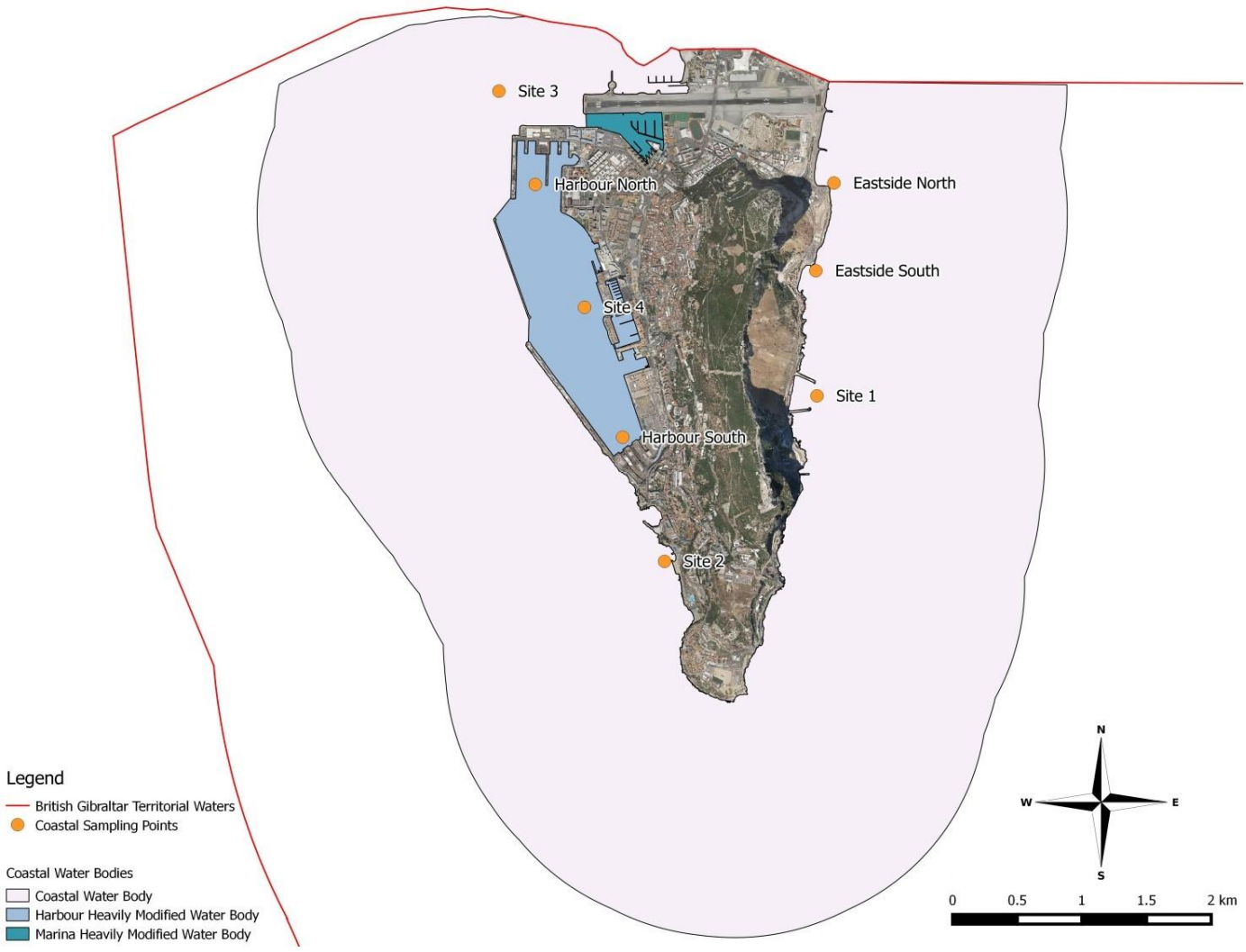


Figure 3: Coastal water sampling points

Executed on a monthly and quarterly basis, the chemical/physio-chemical parameters measured vary by location and frequency of recording as set out in table 32.

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	
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	4 times per year
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	4 times per year
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	4 times per year
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

Table 32: Chemical/Physio-chemical parameters measured

2.2.1 Coastal Monthly and Quarterly Recordings for 2014

On the following pages 2014 results for coastal monthly and quarterly samples are presented. Data for the months of August and December are not available due to poor weather conditions which meant samples could not be obtained. Irrespective of this, all results posted demonstrate that in 2014 Gibraltar Territorial Waters continued to achieve good ecological and chemical status in line with EU Directive requirements.

Location		Site 1. Sandy Bay	Site 2. Camp Bay	Site 3. Camp Bay	Site 4 Mid Harbour
Date of Sampling		**21-JAN-14**	**21-JAN-14**	**21/01/14**	**21-JAN-14**
Analyte	***Units***				
Chromium Hexavalent	ug/l	<30	<30	<30	<30
Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Copper	ug/l	<0.2	0.206	0.445	0.509
Lead	ug/l	<0.04	0.055	0.142	0.156
Nickel	ug/l	<0.3	<0.3	<0.3	<0.3
Zinc	ug/l	0.695	0.812	11.4	0.894
Mercury	ug/l	<0.01	<0.01	<0.01	<0.01
Chromium	ug/l	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01	<0.01	<0.01	<0.01

Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Chloroform :- {Trichloromethane}	ug/l	<0.1	<0.1	<0.1	<0.1

Table 33: Coastal Monitoring (January 2014)

Location		Site 1 Sandy Bay	Site 2 Camp Bay	Site 3 Runway West	Site 4 Mid harbour
Date of Sampling		**25-FEB-14 11:00**	**25-FEB-14**	**25-FEB-14**	**25-FEB-14**
Analyte	***Units***				
Nitrogen as N	mg/l	0.14	0.137	0.14	0.138
Ammoniacal Nitrogen, Filtered as N	mg/l	<0.0200	<0.0200	<0.0200	<0.0200
Nitrite, Filtered as N	mg/l	0.0045	0.0045	0.0057	0.0044
Nitrogen : Total Oxidised, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100
Orthophosphate, Filtered as P	mg/l	0.013	0.01	0.012	<0.0100
Phosphorus : Total	mg/l	<0.02	<0.02	<0.02	<0.02
Chlorophyll, Acetone Extract	ug/l	1.6	2.2	1.9	2.5
Solids, Suspended at 105 C	mg/l	35.2	<3.00	<3.00	<3.00
Nitrate, Filtered as N	mg/l	<0.0955	<0.0955	<0.0943	<0.0956

Table 34: Coastal monitoring (February 2014)

Location		Site 1 - Sandy Bay	Site 2 - Camp Bay	Site 3 - Runway	Site 4 - Mid Harbour
Date of Sampling		**18-MAR-14 11:29**	**18-MAR-14**	**18-MAR-14**	**18-MAR-14**
Analyte	***Units***				
Nitrogen as N	mg/l	<0.100	<0.100	<0.100	0.114
Ammoniacal Nitrogen, Filtered as N	mg/l	<0.0200	<0.0200	<0.0200	<0.0200
Nitrite, Filtered as N	mg/l	<0.00400	0.0048	<0.00400	<0.00400
Nitrogen : Total Oxidised, Filtered as N	mg/l	<0.100	<0.100	0.26	<0.100
Orthophosphate, Filtered as P	mg/l	<0.0100	<0.0100	<0.0100	<0.0100
Phosphorus : Total	mg/l	<0.02	<0.02	<0.02	<0.02
Chlorophyll, Acetone Extract	ug/l	<0.500	<0.500	<0.500	<0.500
Solids, Suspended at 105 C	mg/l	<3.00	<3.00	<3.00	<3.00
Nitrate, Filtered as N	mg/l	<0.100	<0.0952	<0.260	<0.100

Table 35: Coastal monitoring (March 2014)

Location		Site 1 Sandy Bay	Site 2 Camp Bay	Site 3 Runway West	Site 4 Mid harbour
Date of Sampling		13/05/14	13/05/14	13/05/14	13/05/14
Analyte	*Units*				
Nitrogen as N	mg/l	0.139	0.188	0.106	0.176
Ammoniacal Nitrogen, Filtered as N	mg/l	<0.0200	<0.0200	<0.0200	<0.0200
Nitrite, Filtered as N	mg/l	<0.00400	0.0047	<0.00400	<0.00400
Nitrogen : Total Oxidised, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100
Orthophosphate, Filtered as P	mg/l	<0.0100	<0.0100	<0.0100	<0.0100
Phosphorus : Total	mg/l	<0.02	<0.02	<0.02	<0.02
Chlorophyll, Acetone Extract	ug/l	0.59	0.63	0.66	0.65
Solids, Suspended at 105 C	mg/l	<3.00	4.1	<3.00	8
Nitrate, Filtered as N	mg/l	<0.100	<0.0953	<0.100	<0.100

Table 36: Coastal Monitoring (May 2014)

Location		Site 1. Sandy Bay	Site 2. Camp Bay	Site 3. Airport Runway	Site 4 Mid Harbour
Date of Sampling		07 April 2014	07 April 2014	07 April 2014	07 April 2014
Analyte	*Units*				
Chromium Hexavalent	ug/l	<30	<30	<30	<30
Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Copper	ug/l	0.367	1.08	0.481	1.98
Lead	ug/l	0.173	0.247	0.069	0.59
Nickel	ug/l	0.304	1.67	0.337	0.409
Zinc	ug/l	4.48	34.7	2.27	4.01
Mercury	ug/l	<0.01	<0.01	<0.01	<0.01
Chromium	ug/l	<0.5	1.16	<0.5	27.7
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Chloroform :- {Trichloromethane}	ug/l	<0.1	<0.1	<0.1	<0.1

Table 37: Coastal Monitoring (April 2014)

Location		Sit 1. Sandy Bay	Site 2. Camp Bay	Site 3. Airport Runway	Site 4. Mid Harbour
Date of Sampling		25-JUN-14	25-JUN-14	25-JUN-14	25-JUN-14
Analyte	*Units*				
Nitrogen as N	mg/l	<0.100	<0.100	<0.100	<0.100
Ammoniacal Nitrogen, Filtered as N	mg/l	<0.0200	<0.0200	<0.0200	<0.0200
Nitrite, Filtered as N	mg/l	0.0056	0.0051	0.0049	0.0043
Nitrogen : Total Oxidised, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100
Orthophosphate, Filtered as P	mg/l	<0.0100	<0.0100	0.018	<0.0100
Phosphorus : Total	mg/l	<0.02	<0.02	<0.02	0.024
Chlorophyll, Acetone Extract	ug/l	0.94	1.1	0.98	1.1
Solids, Suspended at 105 C	mg/l	<3.00	<3.00	<3.00	<3.00
Nitrate, Filtered as N	mg/l	<0.0944	<0.0949	<0.0951	<0.0957

Table 38: Coastal Monitoring (June 2014)

Location		Site 4 Mid Harbour	Site 3 Runway westside	Site 2 Camp Bay	Site 1 Sandy Bay
Date of Sampling		22-JUL-14	22-JUL-14	22-JUL-14	22-JUL-14
Analyte	*Units*				
Chromium Hexavalent	ug/l	<30	<30	<30	<30
Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Copper	ug/l	0.541	0.541	0.279	0.235
Lead	ug/l	0.239	0.211	0.046	0.059
Nickel	ug/l	<0.3	<0.3	<0.3	<0.3
Zinc	ug/l	1.48	1.6	0.763	0.877
Mercury	ug/l	<0.01	<0.01	<0.01	<0.01
Chromium	ug/l	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Chloroform :- {Trichloromethane}	ug/l	<0.1	<0.1	<0.1	<0.1

Table 39: Coastal Monitoring (July 2014)

Location		Site 1 - Sandy Bay	Site 2 - Camp Bay	Site 3 - Airport Runway/Westside	Site 4 - Mid Harbour
Date of Sampling		23-SEP-14	23-SEP-14	23-SEP-14 12:05	23-SEP-14
Analyte	*Units*				
Nitrogen as N	mg/l	<0.100	0.112	0.101	0.105
Ammoniacal Nitrogen, Filtered as N	mg/l	<0.0200	<0.0200	<0.0200	<0.0200
Nitrite, Filtered as N	mg/l	<0.00400	<0.00400	<0.00400	<0.00400
Nitrogen : Total	mg/l	<0.100	<0.100	<0.100	<0.100
Oxidised, Filtered as N					
Orthophosphate, Filtered as P	mg/l	<0.0100	<0.0100	<0.0100	<0.0100
Phosphorus : Total	mg/l	<0.02	0.0481	<0.02	<0.02
Chlorophyll, Acetone Extract	ug/l	0.53	1.2	1.3	1.2
Solids, Suspended at 105 C	mg/l	3.4	7.7	<3.00	<3.00
Nitrate, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100

Table 40: Coastal Monitoring (September 2014)

Location		Site 1. Sandy Bay	Site 2. Camp Bay	Site 3. Runway North West	Site 4. Mid Harbour
Date of Sampling		22-OCT-14	22-OCT-14	22-OCT-14	22-OCT-14
Analyte	*Units*				
Chromium Hexavalent	ug/l	<30	<30	<30	<30
Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Copper	ug/l	0.239	0.312	1.01	0.302
Lead	ug/l	0.057	0.047	0.424	0.086
Nickel	ug/l	<0.3	<0.3	0.318	<0.3
Zinc	ug/l	1.72	1.55	4.59	4.32
Mercury	ug/l	<0.01	<0.01	<0.01	<0.01
Chromium	ug/l	1.21	<0.5	<0.5	1.65
Benzo(a)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/l	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
Chloroform :- {Trichloromethane}	ug/l	<0.1	<0.1	<0.1	<0.1

Table 41: Coastal Monitoring (October 2014)

Location		Site 1 Sandy Bay	Site 2 Camp Bay	Site 3 Airport runway	Site 4 Mid harbour
Date of Sampling		18-NOV-14	18-NOV-14	18-NOV-14	18-NOV-14
Analyte	*Units*				
Nitrogen as N	**mg/l**	<0.100	0.132	0.11	0.105
Ammoniacal Nitrogen, Filtered as N	mg/l	<0.0200	<0.0200	<0.0200	<0.0200
Nitrite, Filtered as N	mg/l	<0.00400	<0.00400	<0.00400	<0.00400
Nitrogen : Total Oxidised, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100
Orthophosphate, Filtered as P	mg/l	<0.0100	<0.0100	<0.0100	<0.0100
Phosphorus : Total	mg/l	<0.02	<0.02	<0.02	<0.02
Chlorophyll, Acetone Extract	ug/l	11	4.2	5.8	4.3
Solids, Suspended at 105 C	mg/l	4.5	<3.00	3.4	4.4
Nitrate, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100

Table 42: Coastal Monitoring (November 2014)

2.3 Groundwater Monitoring

Under the EU Water Framework Directive, H.M. Department of the Environment and Climate Change also carry out a groundwater monitoring programme where a specific range of chemical/physio-chemical parameters are recorded on a quarterly basis. Carried out at four monitoring points in the Northern Isthmus aquifer and 1 monitoring point in the Southern bedrock aquifer, results obtained for these in 2014 are shown on the following pages. Like the coastal monitoring results, these were all compliant with EU thresholds.

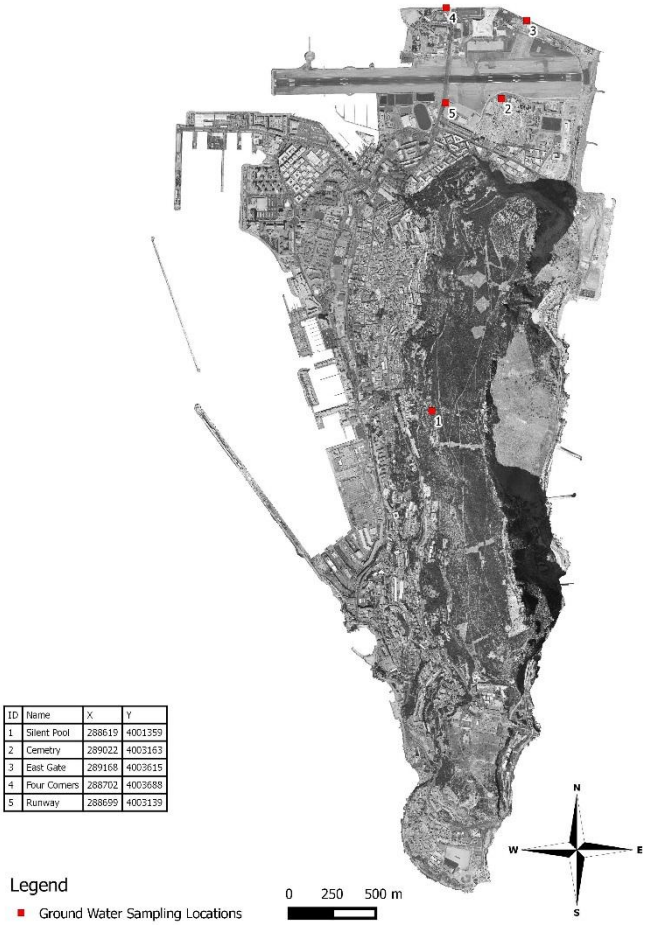


Figure 4: Groundwater sampling points

Location		Site 2 North front cemetery.	Site 3 Land frontier.	Site 5 Runway
Date of Sampling		08-JAN-14 16:15	08-JAN-14 14:35	08-JAN-14 15:10
Analyte	*Units*			
Alkalinity to pH 4.5 as CaCO3	mg/l	200	207	295
Ammoniacal Nitrogen as N	mg/l	<0.0300	<0.0300	<0.0300
Chloride	mg/l	67.4	135	1350
Nitrite as N	mg/l	<0.00400	<0.00400	<0.00400
Nitrogen : Total Oxidised as N	mg/l	4.25	2.07	7.86
Solids, Suspended at 105 C	mg/l	<3	<3	<3
Carbon, Organic : Total as C :- {TOC}	mg/l	2	2	2
Arsenic	ug/l	4.42	2.51	7.27
Cadmium	ug/l	<0.1	0.738	<0.1
Lead	ug/l	<2	<2	<2
Zinc	ug/l	<5	255	30.1
Calcium	mg/l	81.7	63.8	222
Magnesium	mg/l	10.3	17.4	78.9
Potassium	mg/l	9.3	7.55	29.8
Sodium	mg/l	37.7	101	682
Sulphate as SO4	mg/l	30.7	51.5	180
Mercury	ug/l	<0.01	<0.01	<0.01
Bicarbonate as HCO3	mg/l	244	253	360
Nitrate as N	mg/l	<4.25	<2.07	<7.86

Table 43: Groundwater Monitoring (January 2014)

Location		Site 1 Silent pool.
Date of Sampling		12-FEB-14 15:00
Analyte	*Units*	
Alkalinity to pH 4.5 as CaCO3	mg/l	184
Ammoniacal Nitrogen as N	mg/l	<0.0300
Chloride	mg/l	1270
Nitrite as N	mg/l	<0.00400
Nitrogen : Total Oxidised as N	mg/l	4.24
Carbon, Organic : Total as C :- {TOC}	mg/l	<1
Arsenic	ug/l	<1
Cadmium	ug/l	<0.1
Lead	ug/l	<2
Zinc	ug/l	7.93
Calcium	mg/l	108
Magnesium	mg/l	96.7
Potassium	mg/l	27.7
Sodium	mg/l	686
Sulphate as SO4	mg/l	199

Table 44: Groundwater Monitoring (February 2014)

Location		Site 1 Silent Pool	Site 2 Cemetery	Site 3 Frontier	Site 4 Four Corners	Site 5 Runway
Date of Sampling		20/05/14	20/05/14	20/05/14	20/05/14	20/05/14
Analyte	*Units*					
Alkalinity to pH 4.5 as CaCO3	mg/l	166	211	178	189	306
Ammoniacal Nitrogen as N	mg/l	<0.0300	0.047	<0.0300	<0.0300	<0.0300
Chloride	mg/l	1290	182	116	77.5	1210
Nitrite as N	mg/l	<0.00400	0.0096	<0.00400	<0.00400	0.0041
Nitrogen : Total Oxidised as N	mg/l	4.41	7.82	4.7	1.49	6.47
Carbon, Organic : Total as C :- {TOC}	mg/l	-	<3	<3	<3	<3
Solids, Suspended at 105 C	mg/l	<1.00	1	<1.00	4	1
Arsenic	ug/l	<1	9.01	4.36	31.1	7.36
Cadmium	ug/l	<0.1	<0.1	0.362	<0.1	<0.1
Lead	ug/l	<2	<2	<2	<2	<2
Zinc	ug/l	<5	52.8	196	8.02	40.2
Calcium	mg/l	99.9	84.9	67.9	42.9	219
Magnesium	mg/l	90.3	18.1	15.9	18.8	92.8
Potassium	mg/l	24.5	13.2	7.14	16.1	30.2
Sodium	mg/l	653	111	67.3	74	784
Sulphate as SO4	mg/l	182	52.2	43.9	66.8	205
Mercury	ug/l	-	<0.01	<0.01	<0.01	<0.01
Bicarbonate as HCO3	mg/l	-	257	217	231	373
Nitrate as N	mg/l	-	7.81	<4.70	<1.49	6.47

Table 45: Groundwater Monitoring (May 2014)

Location		Site 1. Silent pool	Site 2. Cemetery	Site 3. Frontier	Site 4. Four corners	Site 5. Runway
Date of Sampling		19-AUG-14	19-AUG-14	19-AUG-14	19-AUG-14	19-AUG-14
Analyte	*Units*					
Alkalinity to pH 4.5 as CaCO3	mg/l	136	191	193	186	318
Ammoniacal Nitrogen as N	mg/l	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Chloride	mg/l	1270	44	134	73.6	1650
Nitrite as N	mg/l	<0.00400	0.0056	<0.00400	<0.00400	<0.00400
Nitrogen : Total Oxidised as N	mg/l	4.26	4.39	3.28	0.97	4.9
Solids, Suspended at	mg/l	-	<3	3.2	4.15	<3

105 C						
Carbon, Organic : Total as C :- {TOC}	mg/l	<1.00	<1.00	1.1	4	1.7
Arsenic	ug/l	<1	4.1	2.23	22.1	6.87
Cadmium	ug/l	<0.1	<0.1	1.49	<0.1	<0.1
Lead	ug/l	<2	<2	<2	<2	<2
Zinc	ug/l	6.01	12.7	806	8.85	37
Calcium	mg/l	105	75.7	69.1	44.5	221
Magnesium	mg/l	94.7	9.24	16.6	17.4	98.5
Potassium	mg/l	26.1	9.15	7.21	15.2	36.9
Sodium	mg/l	723	26.9	83.6	73.8	918
Sulphate as SO4	mg/l	197	25.5	45.7	64.8	216
Mercury	ug/l	-	<0.01	<0.01	<0.01	<0.01
Bicarbonate as HCO3	mg/l	-	233	235	227	388
Nitrate as N	mg/l	-	4.38	<3.28	<0.970	<4.90

Table 46: Groundwater Monitoring (August 2014)

Location		**Site1-Silent Pool**	**Site2 Cemetery**	**Site3-Frontier**	**Site4-Four corners**	**Site5-Runway**
Date of Sampling		**09-OCT-14**	**09-OCT-14**	**09-OCT-14**	**09-OCT-14**	**09-OCT-14**
Analyte	***Units***					
Alkalinity to pH 4.5 as CaCO3	mg/l	161	197	199	190	323
Ammoniacal Nitrogen as N	mg/l	0.03	0.03	0.087	0.03	0.03
Chloride	mg/l	1390	45.7	137	73.9	1320
Nitrite as N	mg/l	<0.00400	<0.00400	<0.00400	<0.00400	<0.00400
Nitrogen : Total Oxidised as N	mg/l	4.55	4.3	3.63	0.82	6.75
Solids, Suspended at 105 C	mg/l	-	<3	<3	<3	<3
Carbon, Organic : Total as C :- {TOC}	mg/l	<1.00	<1.00	<1.00	2.6	<1.00
Arsenic	ug/l	<1	4.28	2.12	21.8	7.24
Cadmium	ug/l	<0.1	<0.1	0.975	<0.1	<0.1
Lead	ug/l	<2	<2	<2	<2	<2
Zinc	ug/l	9.57	<5	417	5.7	29.8
Calcium	mg/l	105	77.6	73.1	44.6	211
Magnesium	mg/l	98	9.63	17.3	17.2	81.9
Potassium	mg/l	29.2	8.86	8.05	14.5	38
Sodium	mg/l	687	27.3	85.3	71.6	725
Sulphate as	mg/l	204	26.7	49.8	65.1	182

SO4						
Mercury	ug/l	-	<0.01	<0.01	<0.01	<0.01
Bicarbonate as HCO3	mg/l	-	240	243	232	394
Nitrate as N	mg/l	-	<4.30	<3.63	<0.820	<6.75

Table 47: Groundwater Monitoring (October 2014)

Chapter 3: Habitats

3.0 Birds

3.0.1 Nesting Birds of Prey

Annually, the Gibraltar Ornithological and Natural History Society (GONHS) conduct surveys of birds of prey during the breeding season with records being kept specifically on the sightings of Peregrines (*Falco peregrinus*), Common Kestrel (*Falco tinnunculus*), and Lesser Kestrel (*Falco naumanni*). Records of the sightings that occurred throughout 2014 can be seen below.

3.0.1.a Lesser and Common Kestrel

Year	Lesser Kestrel	Common Kestrel
2001	9	8
2002	9	9
2003	7	10
2004	9	10
2005	14	10
2006	15	10
2007	19	11
2008	21	11
2009	15	11
2010	16	11
2011	18	9
2012	13	8
2013	5	5
2014	4	6

Table 48: Pairs of Lesser Kestrel & Common Kestrel in Gibraltar

3.0.1.b Peregrine Falcon

Year	North face	Catalan Bay	Both Worlds	Oil Tanks	Med Steps	Camp Bay	Mosque	Total
2000	5	3	3	3	2			**16**
2001	4	2	2	2	3	0		**13**
2002	5	0	0	2	6	0		**13**
2003	4	0	0	3	5	0		**12**
2004	2	0	0	3	4	4		**13**
2005	2	0	0	2	2	3	0	**9**
2006	2	2	3	3	4	4	5	**23**
2007	3	0	3	2	0	1	3	**12**
2008	3	3	3	4	0	1	3	**17**
2009	2	2	4	3	3	4	2	**20**
2010	0	0	3	2	0	2	0	**7**
2011	2	3	3	0		3	3	**14**
2012	0	3	2	0		1	2	**8**
2013	4	3	3	0	3	0	0	**13**
2014	3	1	2				0	**6**

Blank entries denote no pairs present at this site

Table 49: Locations of breeding success of Peregrines in Gibraltar

3.0.1.c Yellow-legged Gulls

In recent years, monitoring of the Yellow-legged Gull population has taken place as part of culling initiatives carried out by the GONHS gull control effort. Since initiation, a continuous decline has been noted in the number of these species nesting in Gibraltar and 2014 was no different.

	Adults	1st/yr	2nd/yr	3rd/yr	juvs	Total
January	150	7				157
February	246	6		1		253
March	270		1	9		280
April	**License Renewal**					
May	226		1	5	89	321
June	472			4	211	687
July	177		1	2	149	329
August	1				6	7
September	**Counts**					
October	153	6		1		160
November	266	9				275
December	192					192
Total	2153	28	3	22	455	2661

Table 50: Total of Yellow-legged Gulls culled throughout 2014

In addition to the work carried out by the Gull Control Unit, work was carried out by the Raptor's Unit which uses raptors in urban areas to cause disturbance at gull breeding colonies, roosts and flocks. Using predominantly the Harris Hawks (*Parabuteo unicinctus)* and a Northern Goshawk

(*Accipiter gentilis)* to do this, the overall total number of gulls culled in 2014 by both teams was 3131 gulls; 155 more than the previous year.

3.1 Mammals

3.1.1 Barbary Macaques

In 2014, the macaque population in Gibraltar remained unchanged with the same 5 groups and 4 subgroups found present at the locations described below.

GROUP	TOTAL	SUBGROUP
Middle Hill	54	Middle Hill Rock Gun Catalan Bay / Sandy bay
Prince Philip's Arch	67	Prince Philip's Arch Cable car station
Anglian Way	28	Anglian Way St Michael's Cave Europa Advance
Apes Den	35	None
Farringdon's Area	12	None

Table 51: Barbary Macaque groups and subgroups in 2014

At the end of 2014, the macaque population totalled 158, after having experienced 27 deaths, 26 births, and 7 infant deaths as illustrated in table 52. In addition to this, the exportation of 30 macaques to Blairdrummond Safari Park, Scotland also took place which can be read about in the 2014 Thinking Green Digest at; https://www.gibraltar.gov.gi/new/sites/default/files/HMGoG_Documents/20151124-TG_Digest_2014_FINAL.pdf.

LOCATION	BIRTHS	INFANT DEATHS	DEATHS
Middle Hill	4	1	8
Prince Philip's Arch	9	4	1
Anglian Way	7	2	3
Apes Den	4	0	14
Farringdon's area	2	0	1
TOTAL	26	7	27

Table 52: Births and deaths of Barbary Macaques in 2014

Chapter 4: Waste Management

4.0 Industrial Waste

Due to the absence of heavy industry in Gibraltar, the main sources of industrial waste are shipping, the Ministry of Defence (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 under strict licence conditions until sufficient quantities have been gathered to warrant their transfrontier shipment. It predominantly consists of waste oils, asbestos and asbestos containing products. A detailed breakdown of locally produced hazardous wastes during 2014 is given in table 53.

Ewc Codes		Description Of Waste	Amount Exported (Metric Tonnes)
16 06 01*		Lead Batteries	47.3
16 02 11*		Discarded Equipment Containing Chlorofluorocarbons, HCFC, HFC	72340
16 02 13*		Discarded Equipment Containing Hazardous Components Other Than Those Mentioned In 16 02 03 To 16 02 12, EWL 16 02 13*	330.03
19 08 11*		Sludges Containing Dangerous Substances From Biological Treatment Of Industrial Waste Water	0
15 02 02*		Absorbents	6.27
19 01 13*		Fly Ash	1.45
19 01 11*		Bottom Ash	2.4
06 01 06*		Other Acids	0.69
07 02 13		Waste Plastic	10.6
16 04 04		Alkaline Batteries	0.4
13 04 02*	13 04 03*	Bilge Oils	248.21
13 07 03*		Liquid Fuels	499.251
16 02 11*		Discarded Equipment Containing Chlorofluorocarbons, HCFC, HFC	13.2
16 02 13*		Discarded Equipment Containing Hazardous Components Other Than Those Mentioned In 16 02 09 To 16 02 12	60.04
16 07 08*		Wastes Containing Oil	19767 (Ltrs)
13 02 05* 13 02 07*	13 02 06*	Engine Oils	196.730

13 04 01* 13 04 03*	13 04 02*	Bilge Oils	228.030
13 04 01* 13 04 03*	13 04 02*	Bilge Oils	10.000
		Municipal Waste	13527.578
17 05 03*		Soils And Stones Containing Dangerous Substances	4751.770
17 05 04		Soils And Stones Other Than Those Mentioned In 17 05 03*	4527.870
08 01 11*		Waste Paint And Varnish Containing Organic Solvents Or Other Dangerous Substances	2101.800
17 06 05*		Construction Materials Containing Asbestos	231.950
17 05 03*		Soil & Stones Containing Dangerous Substances	59.220
17 06 05*		Construction Materials Containing Asbestos	17.490
09 01 02*		Water-Based Offset Plate Developer Solutions	1.000
08 01 11*		Waste Paint And Varnish Containing Organic Solvents Or Other Dangerous Substances	4.480
20 01 21*		Fluorescent Tubes And Other Mercury-Containing Waste	0.400
16 03 05*		Organic Wastes Containing Dangerous Substances	13.000
15 01 10*		Packaging Containing Residues Of Or Contaminated By Dangerous Substances	2.660
08 03 17*		Waste Ink Containing Dangerous Substances 08 03 12* & Waste Printing Toner Containing Dangerous Substances	8.509
13 07 03*		Other Fuels (Including Mixtures)	8036.430
17 05 05*		Dredging Spoil Containing Dangerous Substances	15304.870
18 01 03*		Waste Whose Collection & Disposal Is Subject To Special Requirements To Prevent Infections	573.240
17 06 05*		Construction Materials Containing Asbestos	89.893
15 02 02*		Absorbents	2646.737
14 06 03*		Other Solvents & Solvent Mixtures	2.316
13 07 03*		Other Fuels (Including Mixtures)	4508.608
16 01 07*		Oil Filters	15.700
16 10 01*		Aqueous Liquid Wastes Containing Dangerous Substances	45.060
20 01 35*		Discarded Electrical And Electronic Equipment Other Than Those Mentioned In 20 01 21 And 20 01 23 Containing Hazardous Components	5.260
15 02 02*		Absorbents	15.130
16 07 07*		Oil Filters	0.943
12 01 16*		Waste Blasting Material Containing Dangerous Substances	2735.330
08 01 11*		Waste Paint And Varnish Containing Organic Solvents Or Other Dangerous Substances	17.540
10 07 08*		Waste Containing Oil	64.500
13 07 03*		Other Fuels (Including Mixtures)	12.209

13 04 01* 13 05 06*	13 04 02* 13 05 07*	Waste Oil With Water	109.980
13 01 10* 13 02 06* 13 03 07* 13 03 09*	13 02 05* 13 02 07* 13 03 08* 13 03 10*	Used Engine Oil	96.500
12 01 16*		Waste Blasting Materials	17.493
06 02 04*		Sodium And Potassium Hydroxide	6160.000
15 02 02*		Absorbents, Filter Materials (Including Oil Filters Not Otherwise Specified), Wiping Cloths, Protective Clothing Contaminated By Dangerous Substances	17.520
19 01 13*		Fly Ash Containing Dangerous Substances	3.720
19 01 11*		Bottom Ash And Slag Containing Dangerous Substances	13.690
13 05 02*		Sludges From Oil/Water Separators	2.000
14 06 02*		Other Halogenated Solvents And Solvent Mixtures	1.000
06 01 06*		Other Acids	4.731
07 02 13		Waste Plastic	1.920
06 03 13*		Solid Salts And Solutions Containing Heavy Metals	1.500
20 03 01 20 03 03 20 03 99		Mixed Municipal Waste, Street-Cleaning Residues, Municipal Wastes Not Otherwise Specified	16649.760
13 04 02* 13 04 03*		Bilge Oils From Jetty Sewers. Bilge Oils From Other Navigation	1255.770
13 07 03*		Other Fuels (Including Mixtures)	6326.150
13 04 02* 13 04 03*		Bilge Oils From Jetty Sewers. Bilge Oils From Other Navigation	46.980
17 06 05*		Construction Materials Containing Asbestos	144.560
17 05 04		Soil And Stones Other Than Those Mentioned In 17 05 03	1520.790
18 01 03*		Wastes Whose Collection And Disposal Is Subject To Special Requirements In Order To Prevent Infection	6.000
08 03 17* 08 03 12*		Waste Printing Toner Containing Dangerous Substances. Waste Ink Containing Dangerous Substances	14.000
20 01 35*		Discarded Electrical And Electronic Equipment Other Than Those Mentioned In 20 01 21 And 20 01 23 Containing Hazardous Components	1.861
20 01 21*		Fluorescent Tubes And Other Mercury-Containing Waste	9.293
20 01 36		Discarded Electrical And Electronic Equipment Other Than Those Mentioned In 20 01 21, 20 01 23 And 20 01 35	8837.500
17 05 03*		Soil And Stones Containing Dangerous Substances	19.780
17 06 05*		Construction Materials Containing Asbestos	18.000

08 01 11*	Waste Paint And Varnish Containing Organic Solvents Or Other Dangerous Substances	17.000
16 05 04*	Gases In Pressure Containers (Including Halons) Containing Dangerous Substances	0.200
16 06 01*	Lead Batteries	47.000
19 08 11*	Sludges Containing Dangerous Substances From Biological Treatment Of Industrial Waste Water	41.440

Table 53: Breakdown of Industrial Waste Arisings 2014

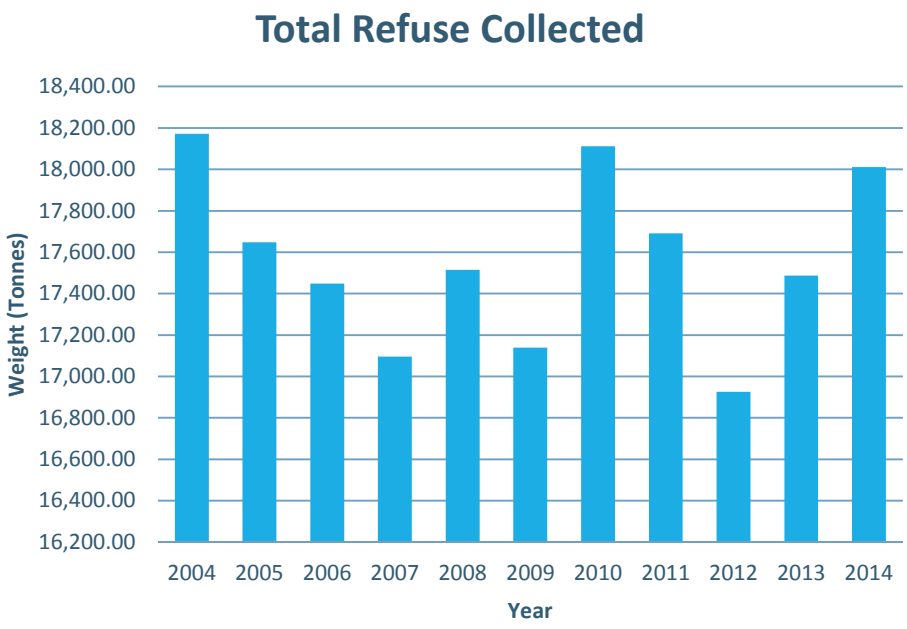
4.1 Municipal Waste

In 2014, a total of 30,192.64 tons of municipal waste were collected and exported to Spain for disposal. Table 54, shows that general refuse (comprising of refuse, household waste and mattresses) contributed the largest majority to 2014 totals by reaching highs of 18,011.64 by the end of the year.

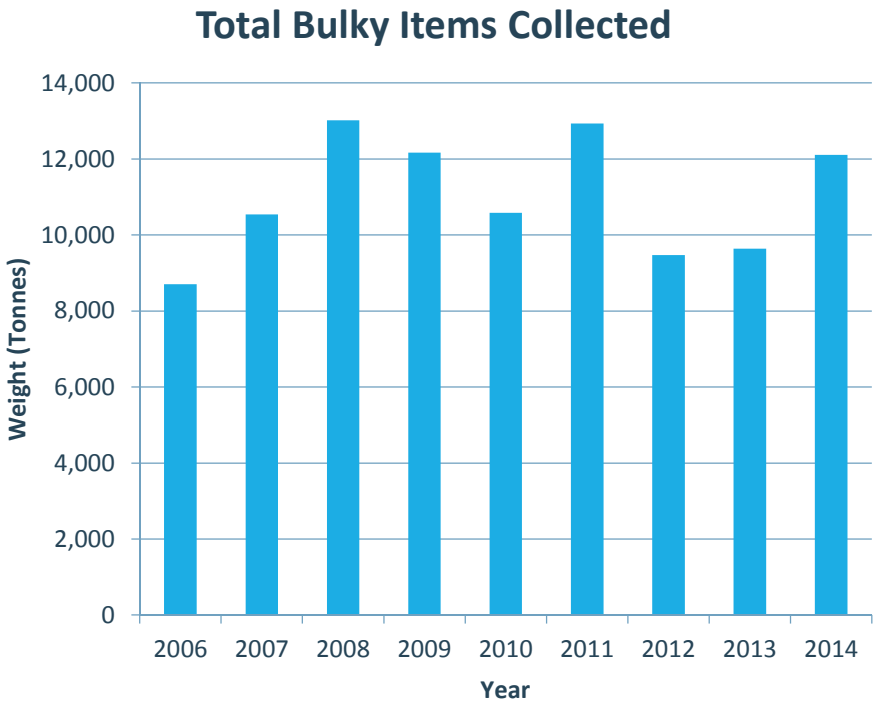
2014	REFUSE	HOUSEHOLDS	MATTRESSES	Total Refuse for Month
MONTH	Weight (TONs)	Weight (TONs)	Weight (TONs)	Weight (TONs)
JANUARY	1,762.600	934.420	5.380	2,702.400
FEBRUARY	1,491.460	866.440	9.220	2,367.120
MARCH	1,497.340	956.880	10.740	2,464.960
APRIL	1,552.980	886.040	5.880	2,444.900
MAY	1,622.940	886.560	5.180	2,514.680
JUNE	1,438.800	910.280	6.480	2,355.560
JULY	1,596.640	989.760	5.900	2,592.300
AUGUST	972.840	1,352.320	5.540	2,330.700
SEPTEMBER	1,578.480	1,060.700	2.740	2,641.920
OCTOBER	1,565.420	1,138.440	9.420	2,713.280
NOVEMBER	1,428.160	1,036.520	6.780	2,471.460
DECEMBER	1,503.980	1,089.380		2,593.360
TOTALS	**18,011.640**	**12,107.740**	**73.260**	**30,192.640**

Table 54: Municipal Waste in Gibraltar in 2014

Comparing these results to 2013 data shows that there has been an increase of 3034 tons of municipal waste over the past year. Graphs 7, 8 and 9 on the following pages show that this has occurred as a result of increases in bulky items and mattress collections.



Graph 7: Annual Refuse Total Comparison (2004 – 2014)

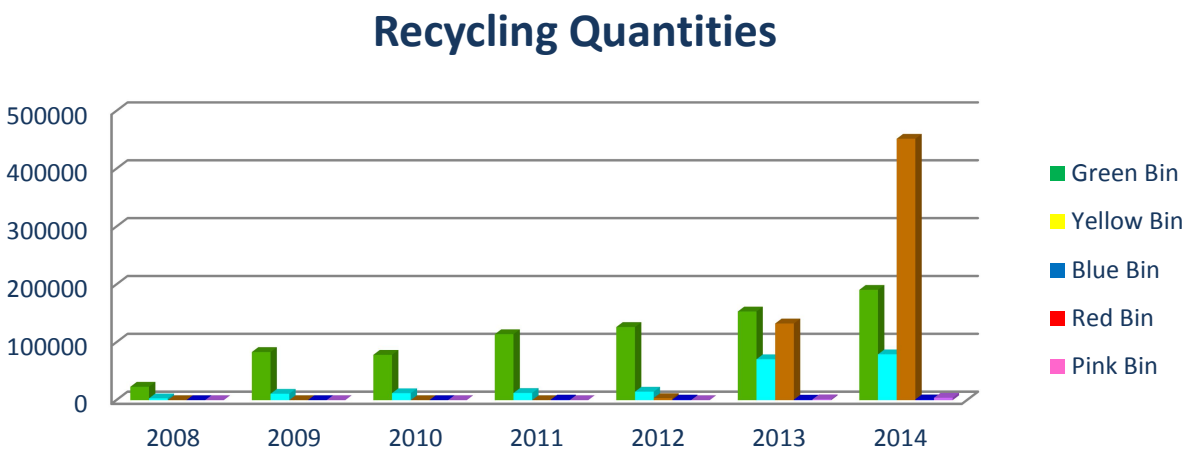


Graph 8: Annual Bulky Items Total Comparison (2006 – 2014)

Graph 9: Annual Mattress Total Comparison (2006 – 2014)

4.2 Recycling

2014 saw the greatest increases in recycling since the introduction of the programme. Soaring from previous years, 2014 saw the total waste recycled increase to 25%.



Graph 10: Recycling quantities (2008 – 2014)

Year	Green Bin	Yellow Bin	Blue Bin	Red Bin	Pink Bin
2014	190650	79180	451790	1270	4118.7

*Weight given in Kilograms (Kgs)

Table 55: Recycling quantities for 2014

Paper and cardboard waste (blue bin) has seen the greatest increases in recycling in the past year – see graph 10 and table 55. In addition to blue bins provided by H.M Department of Environment and

Climate Change, H.M.GOG also contracts out a collection service to collect blue bin waste from their departments and schools. Irrespective of this, it is evident that all categories of recycling waste streams have experienced a marked increase in 2014.

4.2.1 WEEE

The WEEE Directive was transposed into local law through the Environment (Waste) Regulations 2007 (WEEE Regulations). This legislation looks to minimise the environmental impacts of electrical and electronic equipment (EEE) when it reaches the end of its useful life. As a result, systems have been set up to facilitate and encourage the separate collection, subsequent treatment, re-use, recycling and ultimately environmentally sound disposal of WEEE. A list of the quantities of WEEE imported, collected, and exported for treatment and recovery during 2014 are shown below.

Year: 2014	Imported		Collected		Sent for treatment		Recovery
Categories	Quantity (No.)	Weight (tons)	Quantity (No.)	Weight (tons)	Quantity (No.)	Weight (tons)	%
Large Household appliances	148	11.519	7718		9452	447.572	122.467
Small Household appliances	136	0.667	1634		949	4.780925	58.07834
IT and Telecoms Equipment	50651	13.75878	6674		5407	136.5612	81.01588
Consumer Equipment	1022	2.0724	1536		1135	11.72125	73.89323
Lighting equipment	12083	12083	6940		3672	3.7257	52.91066
Electrical and electronic tools	561	1.5426	60		34	0.94325	56.66667
Toys, Leisure & Sports Equipment	1248	1.118	74		38	0.6685	51.35135
Medical devices	1	0.029	38		20	0.232	52.63158
Monitoring & Control Instruments	302	0.2865	2401		2276	0.509	94.79384
Automatic dispensers	0	0	9		1	0.005	11.11111
Totals:	66152	12113.99	27084	0	22984	606.7188	

Table 56: WEEE generation in Gibraltar during 2014

Year		Imported		Collected		Sent for treatment		Recovery	Recycled
	Categories	Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	%	%
2010	Batteries	0	0	25010	0.95	0	0	0	0
2011	Batteries	0	0	1866	2.1155	0	0	0	0
2012	Batteries	2322	27.4619	41107	1.7845	0	1.34	133.1716	6.498094
2013	Batteries	1228	7.36858	117	1.33455	0	0.7	190.65	18.11136
2014	Batteries	313	15.1889	192.5	2.83815	0	0	0	18.68568

Table 57: Battery generation in Gibraltar 2010 – 2014

4.3 Clinical Waste

Providing collection, transportation and incineration services to all local clinical and medical waste producers, EWMS Ltd dealt with the following clinical waste arisings listed in tables 58, 59 and 60 in 2014.

	Year: 2014		
Month	No. of Cont.	Litres per Cont.	Total Litres
January	4389	60	263340
February	4042	60	242520
March	4314	60	258840
April	4397	60	263820
May	4441	60	266460
June	4119	60	247140
July	4428	60	265680
August	4526	60	271560
September	4046	60	242760
October	4526	60	271560
November	4046	60	242760
December	4154	60	249240
Annual Total	51428		3085680

Table 58: Clinical waste collected during 2014

	Year: 2014		
Month	No. of Cont.	Litres per Cont.	Total Litres
January	2828	60	169680
February	3064	60	183840
March	3156	60	189360
April	3472	60	208320
May	3629	60	217740
June	3597	60	215820
July	4070	60	244200
August	3404	60	204240

September	3238	60	194280
October	3828	60	229680
November	3483	60	208980
December	3417	60	205020
Annual Total	41186		2471160

Table 59: Clinical waste locally incinerated during 2014

Month	Year: No. of Cont.	2014 Litres per Cont.	Total Litres
January	2160	60	129600
February	864	60	51840
March	864	60	51840
April	1296	60	77760
May	864	60	51840
June	864	60	51840
July	432	60	25920
August	864	60	51840
September	864	60	51840
October	864	60	51840
November	864	60	51840
December	0	60	0
Annual Total	10800		648000

Table 60: Clinical waste exported for incineration during 2014

Chapter 5: Environmental Health

5.0 Environmental Health

The Environment Agency (EA) to this day has maintained an essential role ensuring well-being of the community and enforcing public health legislation existing in Gibraltar. With this responsibility, the EA acts as the competent authority for any complaints made by the general public in regards to concerns of environmental health issues. In 2014, the total numbers of complaints received by the EA were 1410 and were typically nuisance; health and safety; and pest complaints.

Comparing this figure to 2013 records, it was found that an additional 125 complaints were registered in 2014, with increases in noise complaints contributing significantly to this. This could be as a result of the increased construction activity that has been experienced in Gibraltar in the last year.

5.1 Food Safety

In line with the EA's programmed food hygiene inspections, 2014 saw a total of 1075 premises comprised of restaurants, supermarkets, delicatessens, bakeries, groceries and confectionery outlets, as well as one soda bottling plant. This is 89 more premises than in 2013 but the methodology employed was the same. Again categorized as high, medium or low risk premises, any enforcement carried out was relative to this.

	Total number of food premises inspected in 2013
High Risk	743
Medium	179
Low Risk	153
Total	1075

Table 61: Total number of food premises inspected in 2014

As can be seen from table 61 above, high risk premises were subjected to the highest number of inspections with a total number of 743; whilst medium and low risk undertook significantly lower.

In addition to these food premises inspections, the EA also executed routine food samples on food types that have high protein contents such as cooked meals, meat and poultry products. Reasons for this are because these foods are known as high-risk foods susceptible to bacteria poisoning.

In 2014, the total number of food samples taken by the EA was 83 from which a total number of 25 food borne infections were detected which are listed in table 62. This is a significant reduction of 19 occurrences of food borne infections.

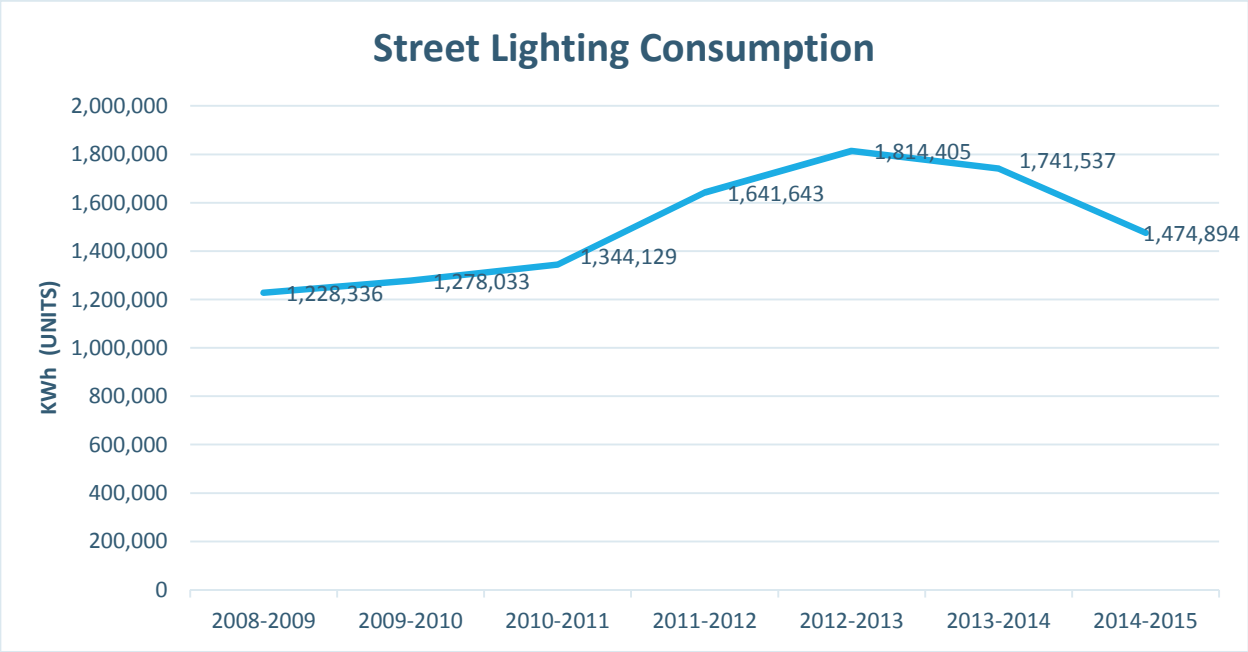
Organism Isolated	2007	2008	2009	2010	2011	2012	2013	2014
Campylobacter Species	67	37	31	29	25	43	23	21
Salmonella species	14	26	18	12	11	10	21	3
Hepatitis A	4	2	4	3	0	0	0	0
Shigella species	-	1	2	0	0	2	0	0
Cryptosporidium	-	-	-	-	-	-	-	1
Total	85	66	55	44	36	55	44	25

Table 62: Type and number of food borne infections recorded in 2014

Chapter 6: Energy

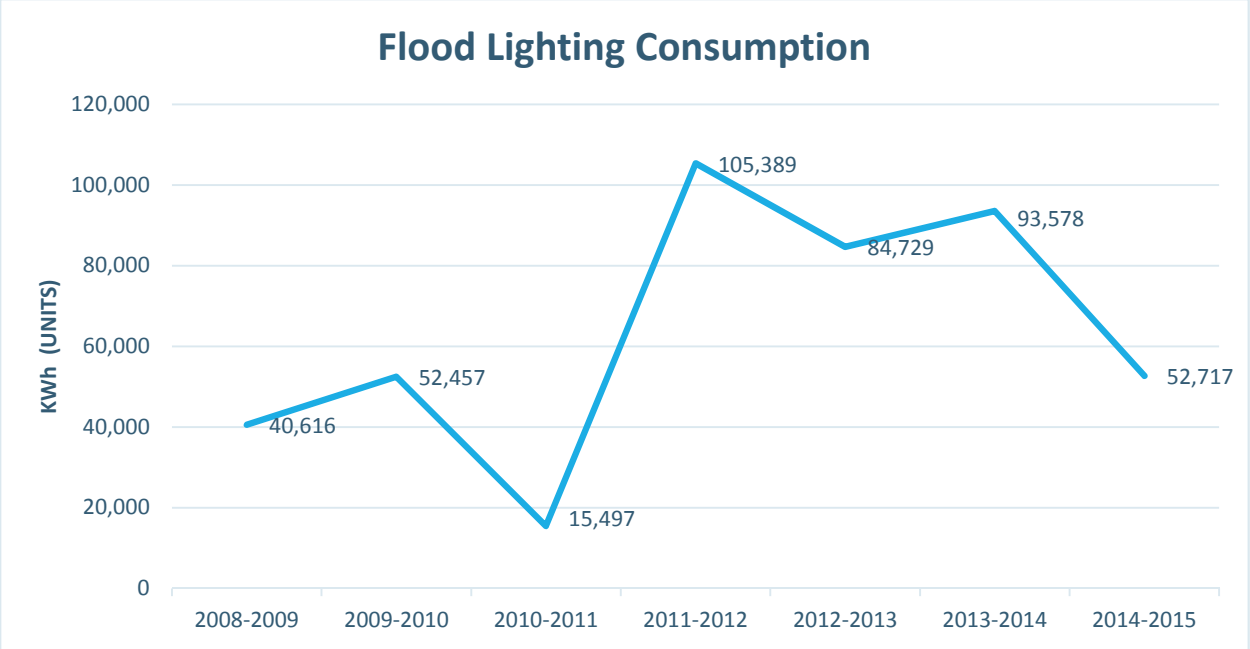
6.1 Lighting

As part of H.M. Government initiatives to improve local energy efficiency, action has been taken to initiate a street lighting replacement scheme. Carried out principally by the Gibraltar Electricity Authority (GEA) on behalf of H.M. Government, they have been responsible for systematically replacing street lights with LED/low energy light in order to reduce energy consumption and consequently carbon emissions.



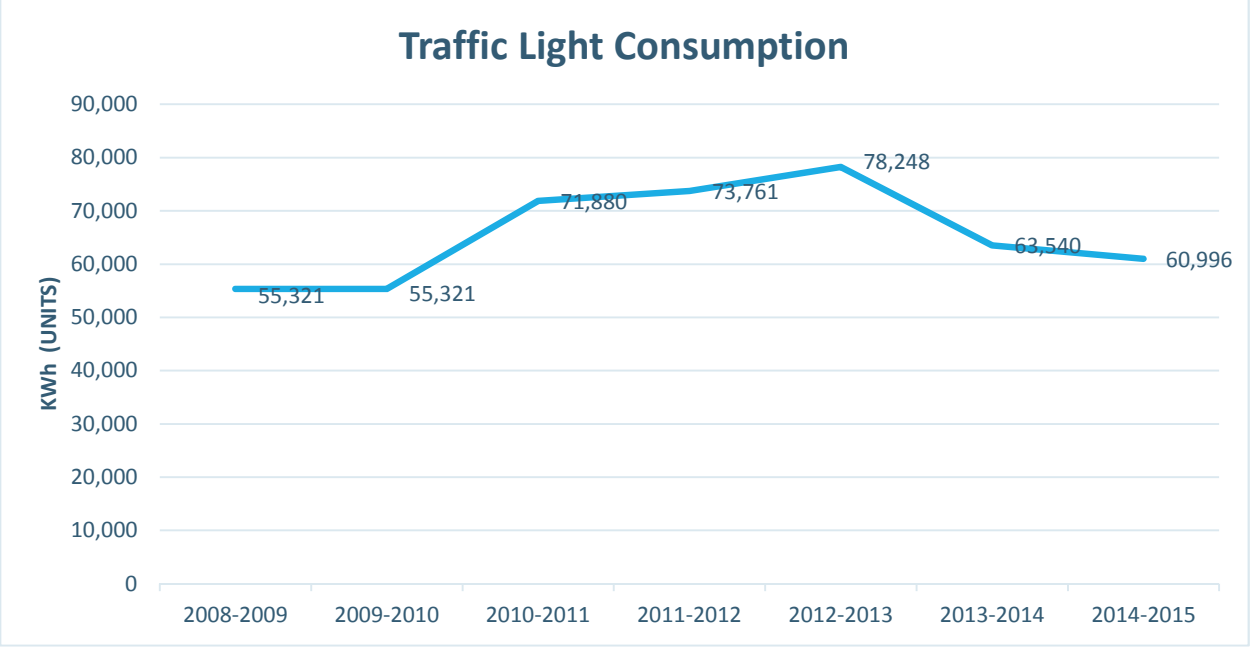
Graph 11: Street Lighting Consumption (kWh) (Source: GEA)

Since the introduction of the scheme there has been a gradual decrease in lighting consumption with the most significant fall being made during 2014 where a large decrease of 266,643 kWh was recorded. Expanding to flood lighting and traffic light consumption also, the results of these also illustrate decreases which are shown in graphs 12 and 13.



Graph 12: Flood Light Consumption (kWh) (Source: GEA)

Recording a significant reduction in consumption, flood lighting during 2014 came down by 40,861kWh to 52,717kWh.



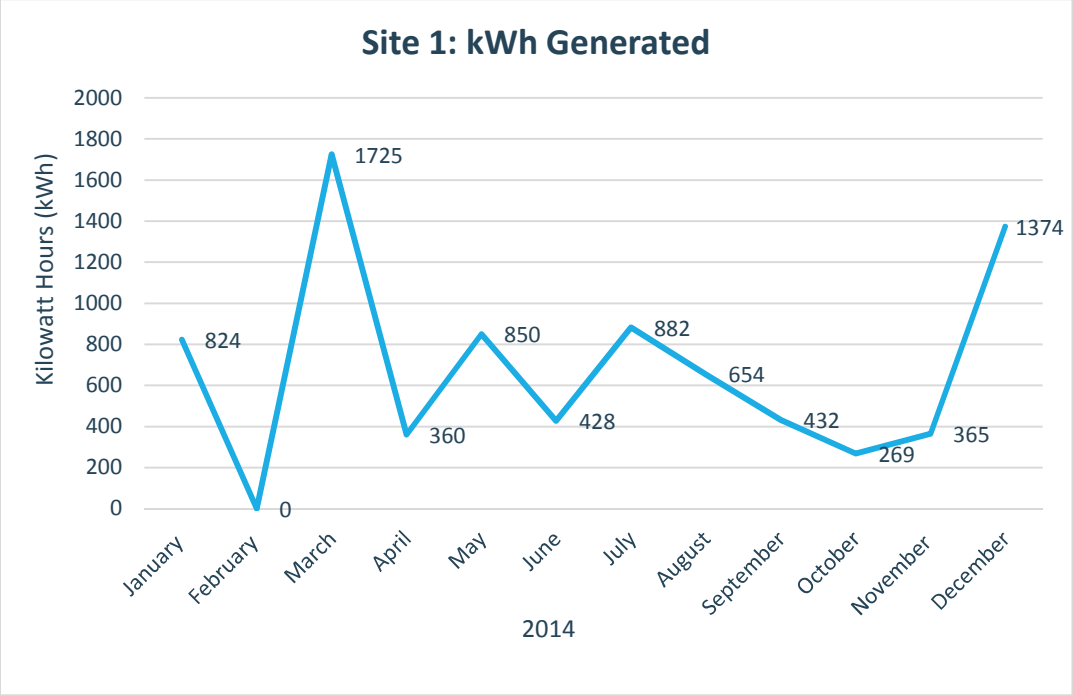
Graph 13: Traffic Light Consumption (kWh) (Source: GEA)

Traffic light consumption continuing a steady reduction saw a decrease of 2544 kWh in the same time.

6.2 Solar Energy

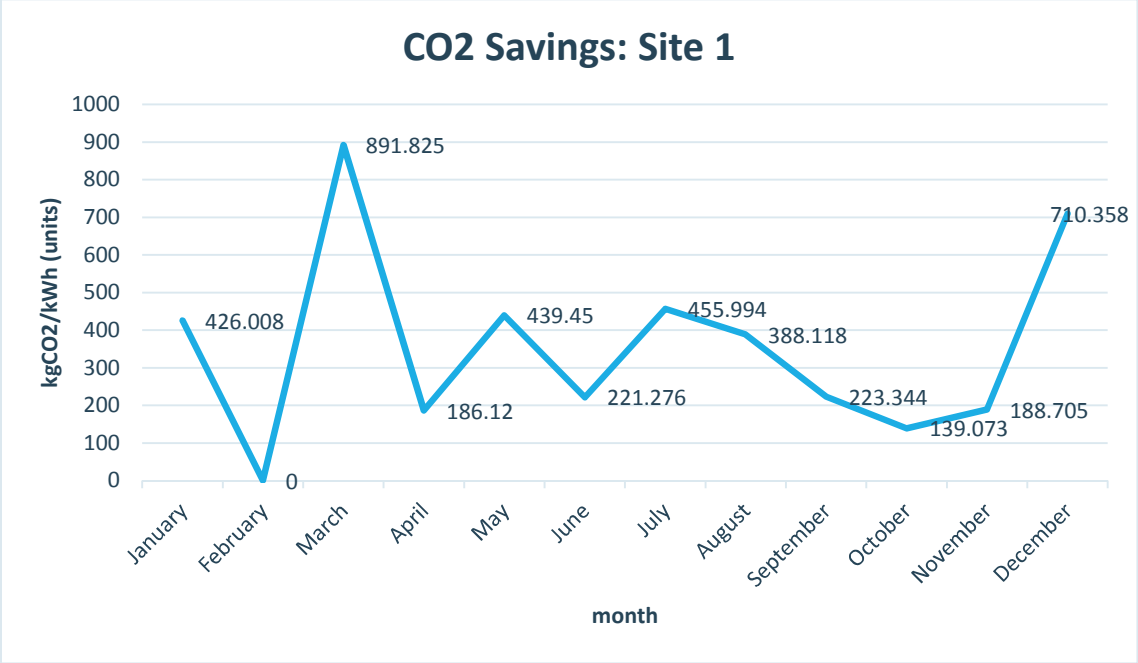
In line with EU targets for sourcing 20% of energy by 2020, installation H.M Government installed two pilot solar thermal projects. To identify their success in local conditions, the monthly amount of electricity generated by them and amount of carbon emissions saved has been monitored. The results from a recreational sports and leisure facility (site 1) and a residential complex (site 2) are discussed on the following pages.

6.2.1 Site 1



Graph 14: Monthly kWh generated at Site 1

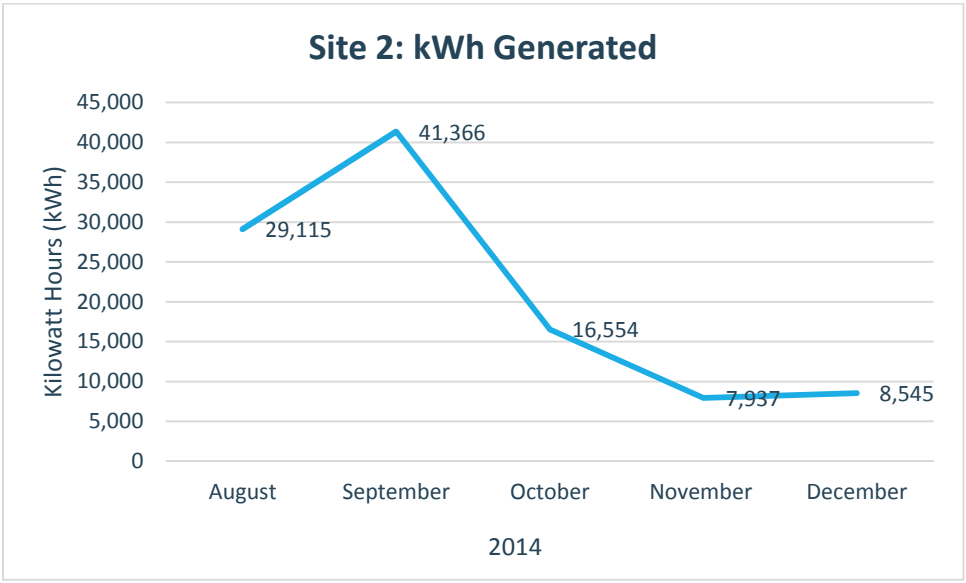
It is clear that there are significant fluctuations in electricity produced on a month to month basis which is most likely due to seasonal changes as well as daily variations in cloud cover. No electricity was produced in February, due to a system malfunction.



Graph 15: Monthly CO2 Savings at Site 1

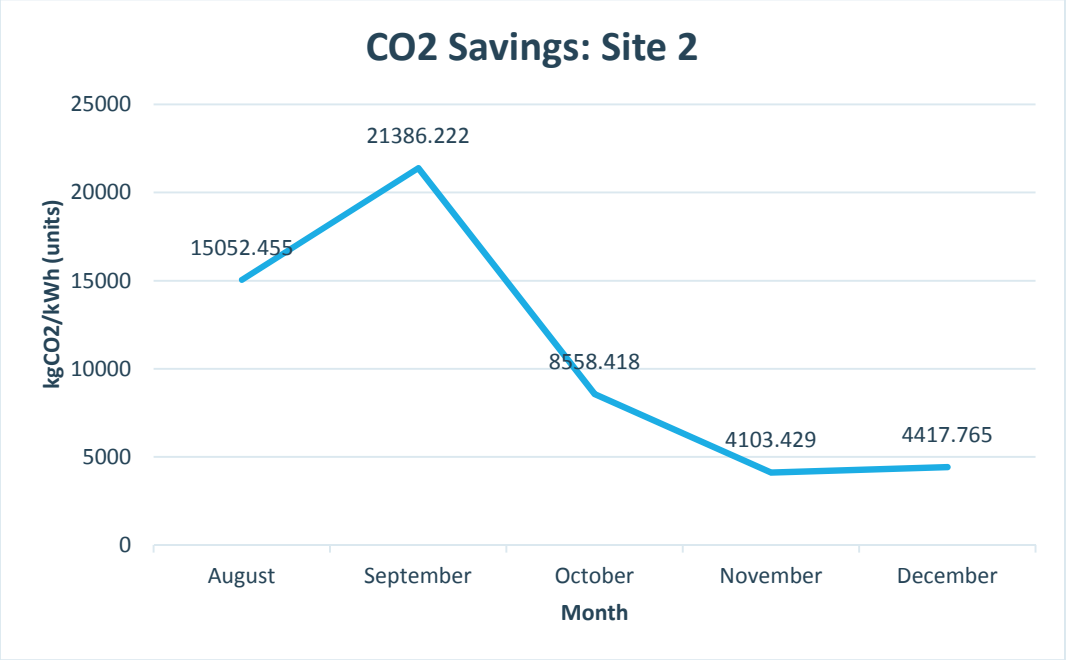
CO2 savings over the year correlate to the amount of electricity produced onsite, with March and December giving the best results.

6.2.2 Site 2



Graph 16: Monthly kWh consumption at Site 2

The system at site 2 became operational in August 2014. September has recorded the highest level of electricity production to date, however, further data will be required in order to draw meaningful conclusions about the systems performance.



Graph 17: Monthly CO2 Savings at Site 2

6.3 Energy Performance Certificates

The Energy Performance of Buildings Directive (EPBD) is an EU initiative aimed at reducing the amount of energy consumed by buildings in an attempt to reduce carbon emissions. It is a legal requirement to obtain an Energy Performance Certificate (EPC) for buildings with fixed heating, cooling or mechanical ventilation, upon construction and prior to sale or rental.

Public authorities or institutions providing public services are also encompassed within the scope of these regulations. According to the Energy Efficiency Directive, Government's across member states are to ensure that as from 1 January 2014, 3% of the total floor area of heated and/or cooled buildings owned and occupied by its central government is renovated each year to meet at least the minimum energy performance requirements. Having carried out a number of EPC's for Government buildings throughout 2014 as shown in the table below, this helps to establish future planning and brings Gibraltar a step closer to achieving this goal.

Government Buildings	Approximate floor area (m^2)	Primary Energy Efficiency Rating	Environmental Impact (CO^2) Rating
Bleak House	1,179	B	C
Central Police Station	944	C	D
New Mole House Police Station	2,265	B	C
St. Bernadette's	863	C	D
Europa Retreat Centre	934	B	D
Gibraltar Broadcasting Corporation	596	C	C
Ince's Hall	1,103	C	C
Jewish Home	3,293	B	C
John Mackintosh Hall	1,425	C	D
Gibraltar Museum	1,153	B	B
No 6 Convent Place	1,130	B	B
Port Authority	533	C	D
Post Office Sorting Office	1,365	B	B
St. Joseph's First & Middle School	7,003	C	C
St. Martin's School	525	D	D
The Culture & Heritage Agency	1,426	C	C
The Mount	1,879	F	G
Varyl Begg Nursery	512	C	C
Customs House	557	B	C
Fire and Rescue Services	863	B	C
Mount Alvernia	4,748	C	E
Westside School	3,397	B	B
Bayside School	5,319	C	C
Bishop Fitzgerald Middle School	2,026	C	C
Sacred Heart Middle School	2,999	B	C
St. Anne's Middle School	3,574	B	B
Governor's Meadow First School	1,750	C	C
Notre Dame First School	2,222	B	C
St. Bernard's First School	976	C	C
St. Paul's First School	2,901	C	D
Hebrew Primary and Middle School	754	B	C

Duke of Kent House	750	B	C
Tercentenary Sports Hall	3,477	A	B
Ocean Views Mental Health Facility (Block C)	2,067	A	A
Sir Joshua Hassan House	1,729	C	C
Income Tax Office	1022	C	C
City Hall	913	B	C
Department of Education	756	C	C
Health Centre	1917	C	C

Table 63: EPC's undertaken and respective grades.