Department of the Environment,
Heritage and Climate Change
HM Government of Gibraltar

Statistics Report 2017

Contents

1. Air Quality

Introduction

From world leaders at a global level, to neighbours in our community, air pollution has become one of our time's greatest concerns coming high in the environmental agenda. Intricately connected to human health, welfare, and the natural environment, air pollution plays a significant role in our quality of life and is the driving force behind climate change.

By measuring the concentration of pollutants in the air, advanced technology is used in order to monitor air pollution and determine the quality of the air we breathe. In Gibraltar, this is done through a formalised programme that makes use of three automatic monitoring stations that measure a variety of pollutants; and a passive monitoring network measuring nitrogen dioxide and volatile organic compounds with diffusion samplers.

Operated with the objective of monitoring legislative compliance and developing future guidance on how to reduce impacts on humans and the natural environment, results logged at all stations are continuously examined and published in near real-time at www.gibraltarairquality.gi.

Month	Number of Visits	Unique Visitors	Page Views
Jan-17	360	153	864
Feb-17	370	189	983
Mar-17	340	160	748
Apr-17	254	126	602
May-17	350	168	876
Jun-17	276	118	547
Jul-17	305	142	794
Aug-17	342	151	845
Sep-17	243	98	626
Oct-17	285	159	700
Nov-17	278	154	606
Dec-17	162	85	362

Gibraltar Air Quality Hits for 2017

The table above provides an indication of the level of activity recorded on Gibraltar's air quality website throughout 2017.

Annual Automatic Data Summary Reports

Rosia Road: 1st January to 31st December 2016

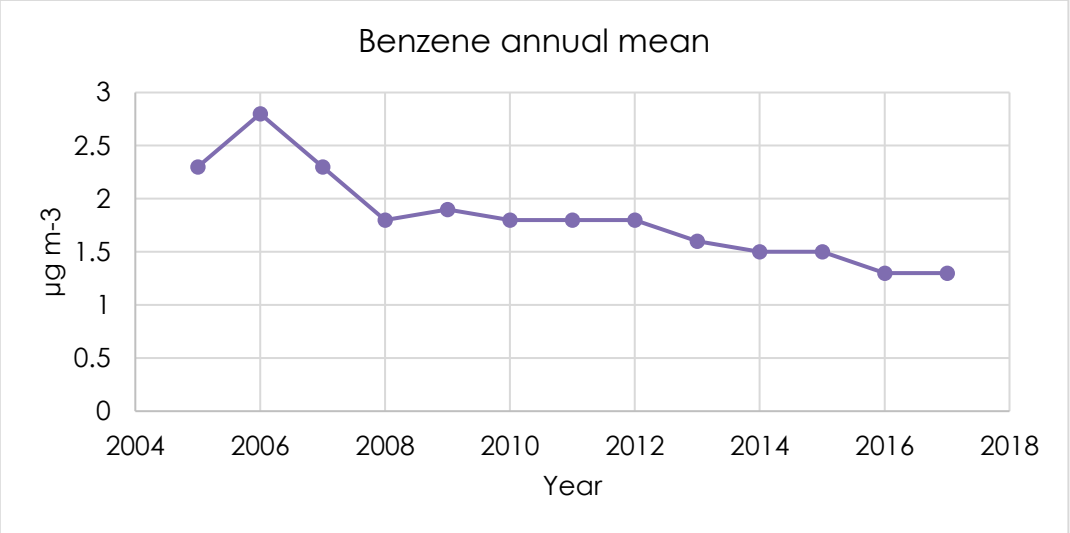
The following series of data highlights recordings taken at the Rosia Road automatic monitoring station throughout 2017. At this site, readings of benzene, carbon monoxide (CO), nitrogen dioxide (NO_2), and sulphur dioxide (SO_2) are taken.

Benzene

POLLUTANT	BENZ
Maximum hourly mean	27.1 µg m^{-3}
Maximum running 8-hour mean	10 µg m^{-3}
Maximum running 24-hour mean	5.4 µg m^{-3}
Maximum daily mean	5.3 µg m^{-3}
Data capture	73%*

*lower than normal capture rate due to equipment failure.

Rosia Road benzene monitored results 2017

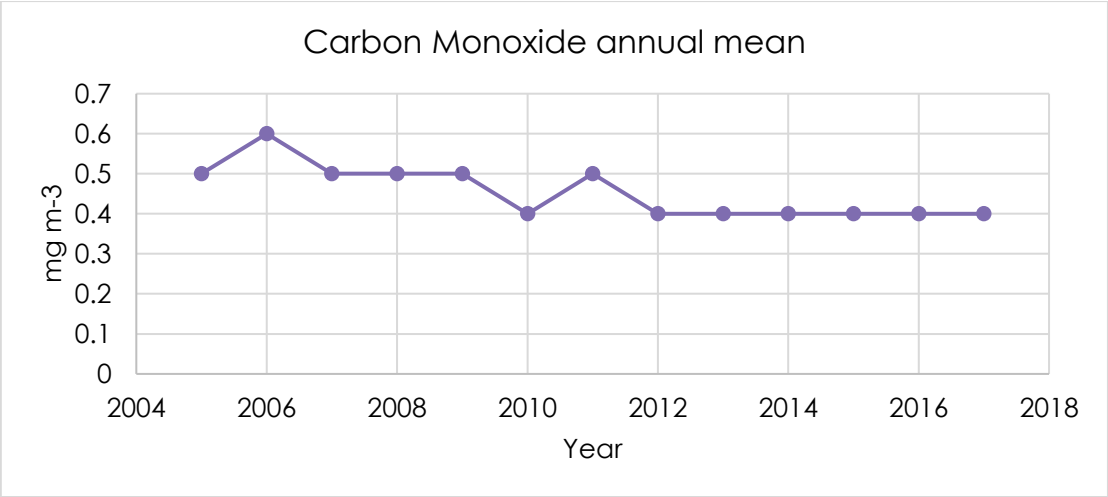


Rosia Road Benzene annual mean

Carbon Monoxide

POLLUTANT	CO
Maximum hourly mean	3 µg m^{-3}
Maximum running 8-hour mean	1.6 µg m^{-3}
Maximum running 24-hour mean	1.2 µg m^{-3}
Maximum daily mean	1.2 µg m^{-3}
Data capture	98.7%

Rosia Road carbon monoxide monitored results 2017

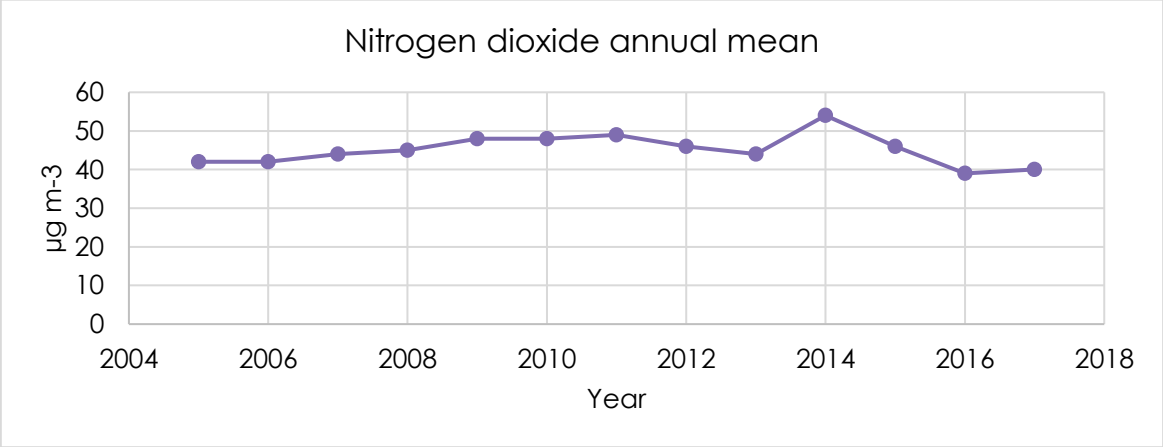


Rosia Road carbon monoxide annual mean

Nitrogen Dioxide

POLLUTANT	NO_2
Maximum hourly mean	136 µg m^{-3}
Maximum running 8-hour mean	123 µg m^{-3}
Maximum running 24-hour mean	106 µg m^{-3}
Maximum daily mean	99 µg m^{-3}
Data capture	98%

Rosia Road nitrogen dioxide monitored results 2017



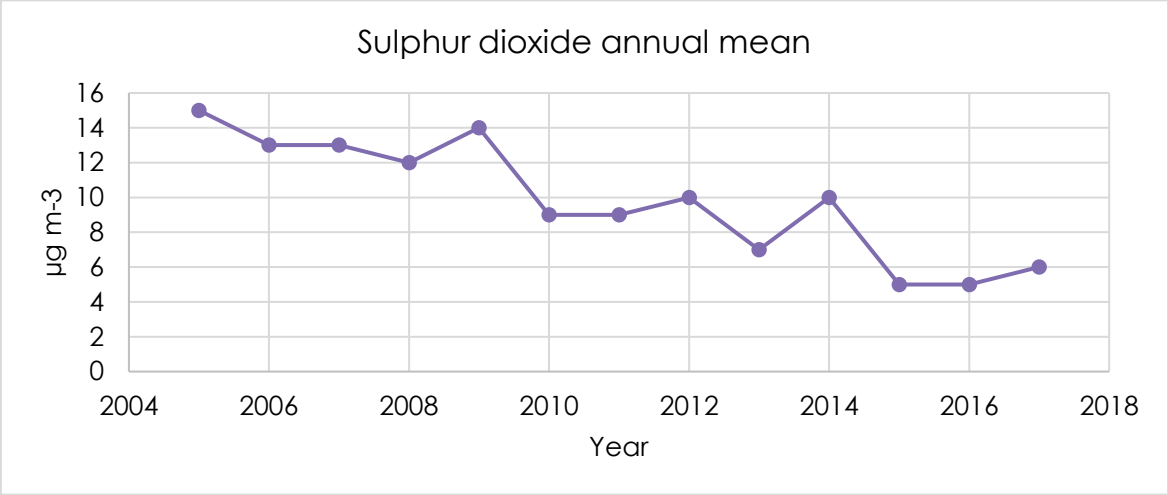
Rosia Road nitrogen dioxide annual mean

Sulphur Dioxide

POLLUTANT	SO_2
Maximum hourly mean	139 µg m^{-3}
Maximum running 8-hour mean	45 µg m^{-3}

Maximum running 24-hour mean	35 µg m^{-3}
Maximum daily mean	27 µg m^{-3}
Data capture	98%

Rosia Road sulphur dioxide monitored results 2017



Rosia Road sulphur dioxide annual mean

Exceedances

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}	0
Sulphur Dioxide	Annual mean > 20 µg m^{-3}	0

Rosia Road pollutant exceedances for 2017

Assessing available data, results show that no threshold exceedances were detected at Rosia Road for the year 2017.

South District Power Stations

The table below highlights engine operating hours of South District power stations for 2017.

Engine Hours	
	Total 2017
GMES EX MOD Power Station (sets 7-9)	723
GMES South Temp. Gen. (Sets 21-30)	40,878
GMES SO Energy Temp (turbines 1+2)	1,245
Portman Temp. Gen. (Sets 1-6)	11,702

South District Power Stations engine hours in 2017

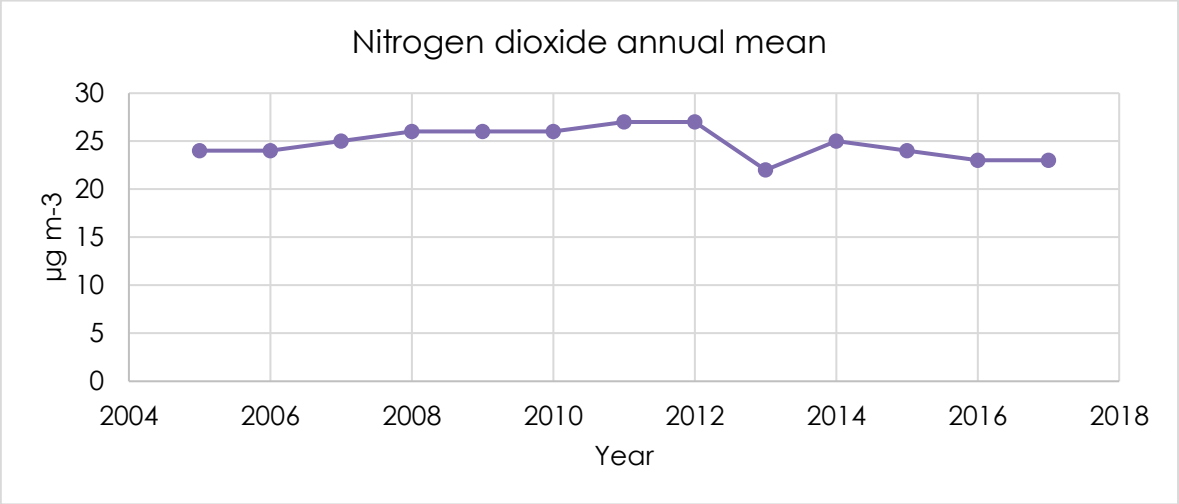
Bleak House: 1st January to 31st December 2017

Below, air pollutant data for the suburban setting of Bleak House are shown. At this site, nitrogen dioxide and ozone (O_3) are monitored.

Nitrogen Dioxide

POLLUTANT	NO_2
Maximum hourly mean	132 µg m^{-3}
Maximum running 8-hour mean	112 µg m^{-3}
Maximum running 24-hour mean	81 µg m^{-3}
Maximum daily mean	74 µg m^{-3}
Data capture	90%

Bleak House nitrogen dioxide monitored results 2017

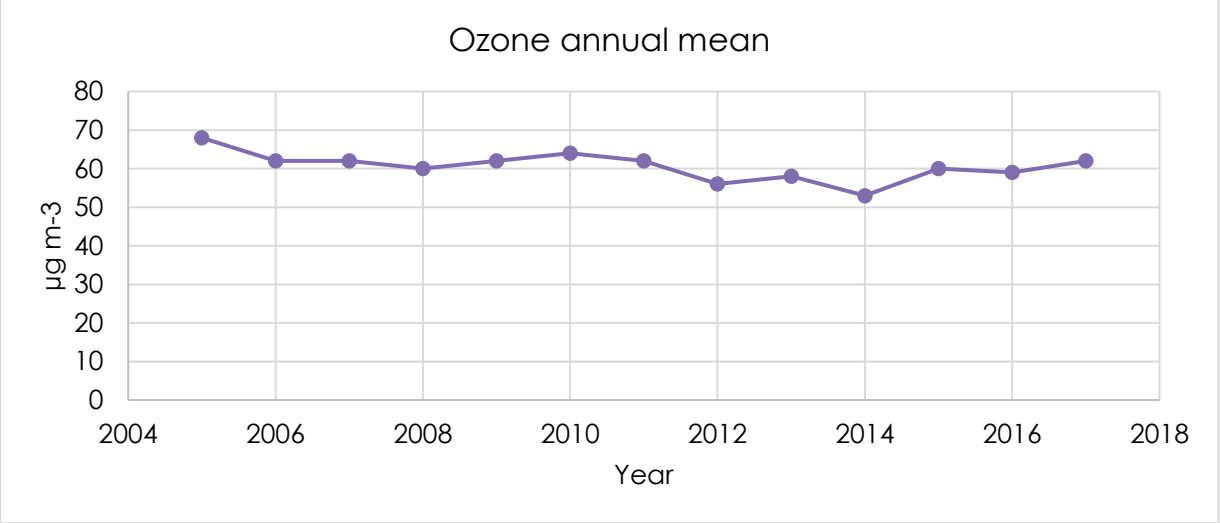


Bleak House nitrogen dioxide annual mean

Ozone

POLLUTANT	O_3
Maximum hourly mean	134 µg m^{-3}
Maximum running 8-hour mean	122 µg m^{-3}
Maximum running 24-hour mean	114 µg m^{-3}
Maximum daily mean	112 µg m^{-3}
Data capture	94%

Bleak House ozone monitored results 2017



Bleak House ozone annual mean

Exceedances

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

Bleak House pollutant exceedances for 2017

Reviewing pollutant data for Bleak House, overall improvements are noted with nitrogen dioxide continuing to achieve no threshold exceedances, and ozone reducing its incidences to two from three in 2016. In addition to this, the maximum running 8-hour mean for ozone was registered at 122 µg m^{-3} which is just 2 µg m^{-3} above required limits.

Ozone is formed by the sunlight-initiated oxidation of volatile organic compounds (VOCs) in the presence of nitrogen oxides (NO_x). Not produced locally, this pollutant is created from ozone precursors that are predominantly of a transboundary nature. As a result, this issue is currently being tackled through international agreements on a global scale.

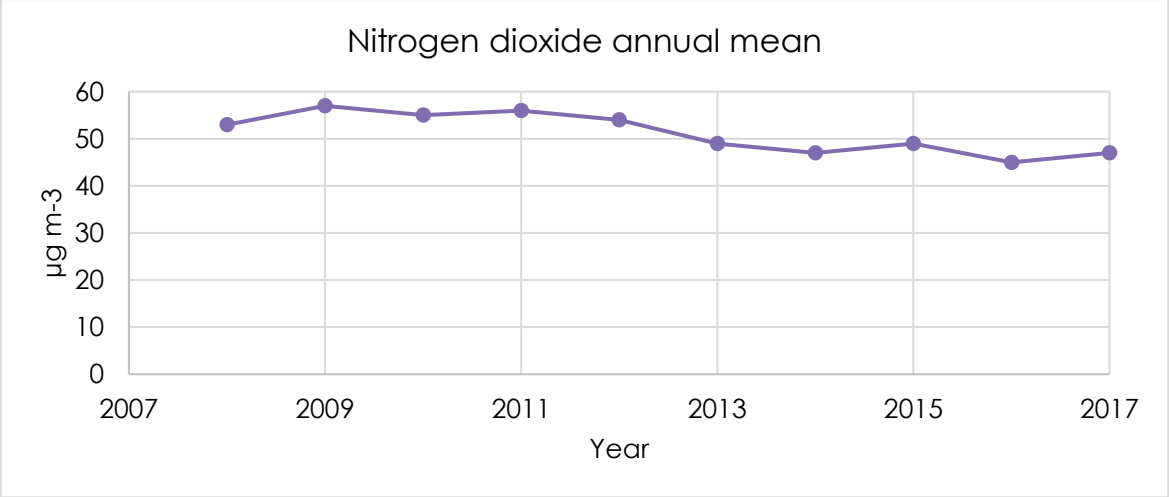
Witham's Road: 1st January to 31st December 2017

As the third automatic monitoring station, Witham's Road is located in the South District and within range of the South District power stations. Positioned here intentionally to observe the effects of traffic and power station emissions on pollutant levels, nitrogen dioxide is recorded at this site and has been regulated since 2008.

Nitrogen Dioxide

POLLUTANT	NO_2
Maximum hourly mean	357 µg m^{-3}
Maximum running 8-hour mean	180 µg m^{-3}
Maximum running 24-hour mean	110 µg m^{-3}
Maximum daily mean	109 µg m^{-3}
Data capture	99%

Witham's Road nitrogen dioxide monitored results 2017



Witham's Road nitrogen dioxide annual mean

Exceedances

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}	7

Witham's Road pollutant exceedances for 2017

In 2017, pollutant concentrations at Witham's Road increased slightly from 2016 but remained below 2015 levels. Recording seven exceedances throughout the year, the nitrogen dioxide maximum hourly mean concentration peaked at 357 µg m^{-3} at the site which is 141 µg m^{-3} greater than in 2016. Despite this, the average concentration only increased by 2 µg m^{-3} compared to 2016 which stood at 45 µg m^{-3}.

Overview of Gibraltar's automatic air pollution measurement

To ensure the accuracy and reliability of all results documented by Gibraltar's air quality monitoring programme, substantial data capture is necessary. As such, an average of 90% data capture for all monitored parameters took place in 2017.

2017 Sites	CO	NO2	O3	PM10	PM2.5	SO2	Total
Number of Sites	7	155	75	75	78	27	170
Number of sites < 85 %	0	3	2	5	14	5	10
Number of sites < 90%	0	4	3	15	21	6	18
Network Mean (%) (UK)	97.1	96.6	97.0	91.1	89.5	87.4	94.4
Gibraltar Network Mean (%)	99	96	94	73	78	98	89.6

Data capture for 2017

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 against these policies. Within this section, pollutants from the automatic monitoring framework (carbon monoxide, nitrogen dioxide, sulphur dioxide and ozone) are 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}	**1.6 mg m-3**

Automatic measurement of Carbon Monoxide in 2017

Air Quality Objective for NO_2	Recorded Annual Mean
40 µg m^{-3}	**40 µg m-3 (Rosia Road)** **47 µg m-3 (Witham's Road)** **23 µg m-3 (Bleak House)**

Recorded annual means for Nitrogen Dioxide in 2017

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	**136 µg m^{-3} (Rosia Road)** **357 µg m^{-3} (Witham's Road)** **Target Value exceeded on 7 days** **132 µg m^{-3} (Bleak House)**

Recorded one hour mean for Nitrogen Dioxide in 2017

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	**27 µg m^{-3}**
350 µg m^{-3} not to be exceeded more than 24 times per year	**139 µg m^{-3}**

Recorded daily mean for Sulphur Dioxide in 2017

Air Quality Objective for Benzene (Annual Mean)	Recorded Annual Mean
5 µg m^{-3}	**1.3 µg m^{-3}**

Recorded annual mean for Benzene in 2017

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**

Maximum rolling 8-hr mean for Ozone in 2017

Evaluating the results above, all pollutants tracked under the automatic monitoring framework were successful in adhering to legislative thresholds except nitrogen dioxide at one site (Witham's Road). According to the data, nitrogen dioxide levels at Witham's Road did not meet the 40 µg m^{-3} requirement reaching a total of 47 µg m^{-3}. The closure of the South District power stations following the opening of the new North Mole power station, due during the first part of 2019, is expected to significantly improve this.

Review of Gibraltar's non-automatic air pollution measurements

As part of Gibraltar's non-automatic monitoring programme, concentrations of particulates and heavy metals such as arsenic (As), cadmium (Cd), nickel (Ni), and lead (Pb) are measured. Assessed against limit values and objectives, the following series of data highlights compliant figures in green and non-compliant in red.

Lead

Air Quality Objective for Lead (measured as an annual mean)	Recorded Annual Mean
0.5 µg m^{-3}	**0.0086 µg m^{-3} (Rosia Road)**

Recorded annual mean for Lead in 2017

Particulate Matter (PM_{10})

Air Quality Objective for PM_{10} (measured as an annual mean)	Recorded Annual Mean
40 µg m^{-3}	**28 µg m^{-3} (Rosia Road)**
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	**11**

Bleak House PM_{10} recorded annual mean and compliance 2017

	2010	2011	2012	2013	2014	2015	2016	2017
% Data Capture	95	85	90	73	82	94	93	81
Annual Mean PM_{10} (40 µg m^{-3})*	40.6	34	34	36	36	31	28	28
Max. 24-hour mean PM_{10}	130	65	83	88	155	41	41	102
Days > 50 µg m^{-3} (35 day limit)*	64	25	18	15	17	16	11	11

Breakdown of PM_{10} statistics for Rosia Road

Particulate Matter (PM2.5)

Air Quality Objective for $PM_{2.5}$ (measured as an annual mean)	Recorded Annual Mean
20µg m^{-3}	**13 µg m^{-3}**

$PM_{2.5}$ recorded annual mean for 2017

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

Pollutant	Parameter	Target Value	Recorded Average
Arsenic	Annual average	6 ng m^{-3}	**1.4 (Rosia Road)** **1.6 (Bleak House)**
Cadmium	Annual average	5 ng m^{-3}	**1.6 (Rosia Road)** **2.1 (Bleak House)**
Nickel	Annual average	20 ng m^{-3}	**14 (Rosia Road)**
BAP	Annual average	1 ng m^{-3}	**0.07 (Rosia Road)**

4th Daughter Directive pollutant recordings for 2017

Diffusion Tube Networks

Integral to the non-automatic monitoring programme, a diffusion tube based method is used to assess monthly average concentrations of nitrogen dioxide and benzene at a number of sites across Gibraltar. Diffusion tube results are indicative only and not as reliable as the automatic monitoring network.

Summary of Hydrocarbon Results

In the table that follows, average hydrocarbon concentrations for benzene are shown. With a pollutant threshold of 5 µg m^{-3}, the table highlights where compliance has been achieved, and also provides a comparison to the previous year's results to determine whether there are improvements being made.

Site ID	Site Name	2016 Benzene (µg m-3)	2017 Benzene (µg m-3)	Difference
gib1	Rosia Road	0.9	1.2	0.3
gib15	Catalan Bay Road	0.4	0.5	0.1
gib16	Laguna Estate	0.5	0.7	0.2
gib17	Kings Lines Fuel Depot	0.7	0.9	0.2
gib18	Moorish Castle Estate	0.5	1.9	1.4
gib19	North Mole	0.7	0.5	- 0.2
gib2	Bleak House	0.5	0.5	0
gib20	Sundial Roundabout	1.1	1.3	0.2
gib21	Anchorage Rosia Road	1.1	0.9	- 0.2
gib3	Jumpers	0.9	1	0.1
gib30	Governors Meadow House	0.6	0.7	0.1
gib4	Devils Tower Road	0.6	0.6	0
gib5	Glacis Road	0.6	1.3	0.7
gib6	Queensway	1	1.1	0.1
gib7	Harbour Views	0.6	0.5	- 0.1

Average hydrocarbon concentrations for benzene 2017

Examining the results, it is clear to see that compliance was achieved at all sites, with readings at all locations well below the 5 µg m-3 threshold. Some locations, however, did experience a slight increase in concentrations from the previous year.

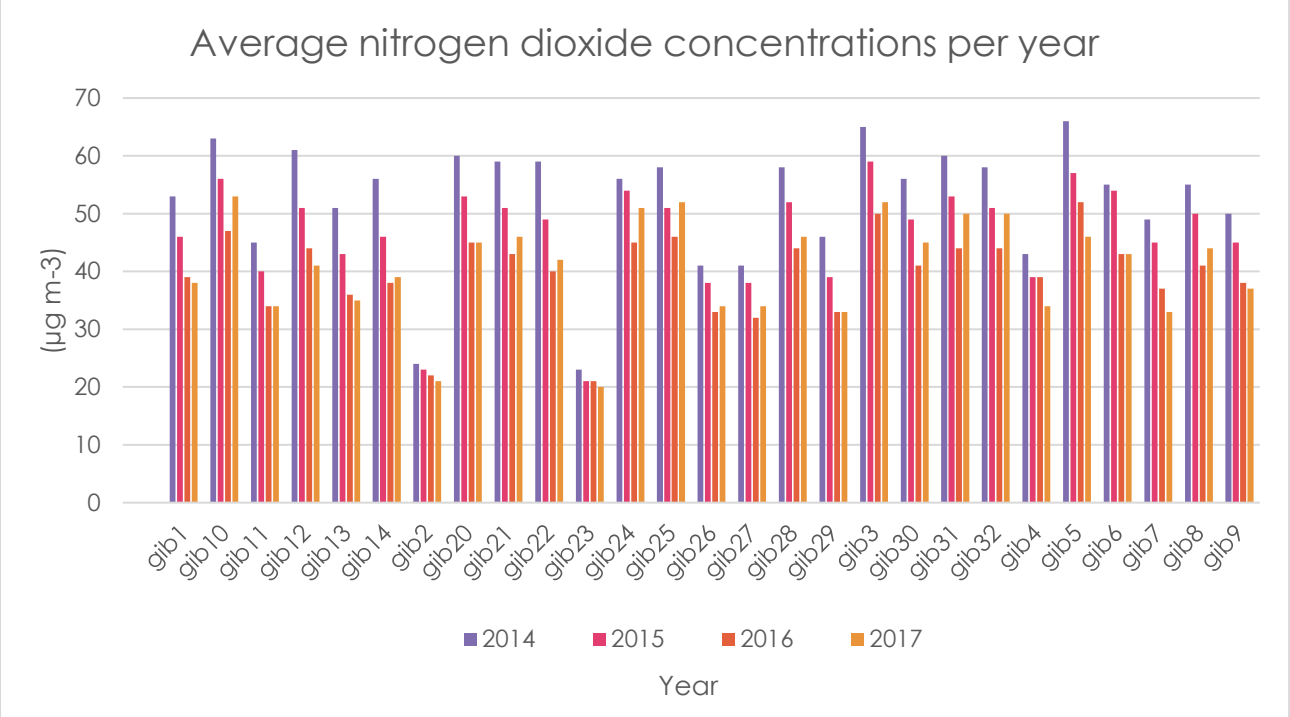
Nitrogen Dioxide Network

The following table shows diffusion tube readings of nitrogen dioxide at a variety of locations throughout Gibraltar. Keeping in mind threshold limits of 40 µg m^{-3}, the following trends were recorded.

Site ID	Site Name	2016 NO2 (µg m-3)	2017 NO2 (µg m-3)	Difference
gib1	Rosia Road	39	38	- 1
gib10	South Barracks Road	47	53	6
gib11	Main Street	34	34	0
gib12	Water Gardens	44	41	- 3
gib13	George Don House	36	35	- 1
gib14	Prince Edwards Road	38	39	1
gib2	Bleak House	22	21	- 1
gib20	Sundial Roundabout	45	45	0
gib21	Anchorage Rosia Road	43	46	3
gib22	Rosia Promenade	40	42	2
gib23	Lathbury Industrial Park	21	20	- 1
gib24	Upper Withams Entrance	45	51	6
gib25	Churchill House	46	52	6
gib26	Alameda Gardens Theatre	33	34	1
gib27	Alameda Gardens Access Road	32	34	2
gib28	Rock Hotel	44	46	2
gib29	Gardiners Road	33	33	0
gib3	Jumpers	50	52	2
gib30	Governors Meadow House	41	45	4
gib31	Dockyard Road	44	50	6
gib32	Woodford Cottage	44	50	6
gib4	Devils Tower Road	39	34	5
gib5	Glacis Road	52	46	- 6
gib6	Queensway	43	43	0
gib7	Harbour Views	37	33	4
gib8	Red Sands Road	41	44	3
gib9	Lime Kiln Road	38	37	- 1

Average nitrogen dioxide concentrations in 2017

Assessing the results for 2017 exceedances in nitrogen dioxide concentrations were recorded in 15 sites. Most of the sites where there was an increase from 2016 were in parts of the South, and may be related to increased activity at Gibdock during part of the year. In contrast, there was reduction in concentrations in several of the North District locations. For example, in the past, Glacis Road has typically recorded the greatest exceedances; however, in 2017 it significantly improved in air quality reducing by a concentration of 6 µg m^{-3}. In recent years, all sites have experienced a general downward trend as illustrated in the chart.



Average nitrogen dioxide concentrations 2014-2015

2. Natural Resources

Bathing Waters

The Bathing Water Directive (2006/7/EC) was adopted on the 15th February 2006 and was transposed into Gibraltar law by the Environment (Quality of Bathing Water) Regulations 2009. In accordance with the requirements of this legislation, regular monitoring is executed and samples taken from Gibraltar's six bathing areas that include Camp Bay, Catalan Bay, Eastern Beach, Little Bay, Sandy Bay and Western Beach.

Site Name	Number of samples taken
Camp Bay	48
Little Bay	47
Catalan Bay	47
Sandy Bay	48
Eastern Beach	48
Western Beach	391

As part of bathing water legislation, there is a requirement to monitor two microbiological indicators of faecal contamination: *E Coli* and intestinal enterococci. Classified into four categories being: "excellent", "good", "sufficient", or "poor", the analyses of these samples taken consider the results over the current bathing season and the preceding three years instead of a single year's result. This allows more reliable assessments to be made as classifications will be less susceptible to bad weather or one-off incidents.

Camp Bay No. of occasions of low water quality		
	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2015	0	0
2016	0	0
2017	0	0

Incidences of low water quality at Camp Bay

Little Bay No. of occasions of low water quality		
	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2015	0	0
2016	0	1
2017	0	0

Incidences of low water quality at Little Bay

Catalan Bay No. of occasions of low water quality		
	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2015	0	0
2016	0	1
2017	1	1

Incidences of low water quality at Catalan Bay

Sandy Bay No. of occasions of low water quality		
	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2015	0	0
2016	1	1
2017	0	0

Incidences of low water quality at Sandy Bay

Eastern Beach No. of occasions of low water quality		
	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2015	0	0
2016	2	1
2017	0	0

Incidences of low water quality at Eastern Beach

Western Beach No. of occasions of low water quality		
	E.Coli >500 cfu/100ml	Intestinal enterococci >185 cfu/100ml
2015	161	155
2016	112	96
2017	43	36

Incidences of low water quality at Western Beach

Analysing the results, beaches including Camp Bay, Little Bay, Sandy Bay and Eastern Beach were all successful in experiencing no incidences of low water quality through 2017. Scaling up, Catalan Bay recorded one occasion of high *E.coli* and intestinal enterococci in February 2017. Western beach, home to the largest number of occurrences of low water quality in 2017, experienced its highest presence of *E.coli* in October 2017 with a reading of 72,600 cfu/100ml. Intestinal enterococci also peaked during this month with a total of 8,400 cfu/100ml. Although the number of incidences of low water quality occurring at this beach is high, due to a sewage overflow pipe in neighbouring Spanish town of La Linea, it must be noted that this is a significant reduction from 2016 which saw 112 occasions of low quality for *E.coli*, and 96 occasions for intestinal enterococci.

Potable Water Supply

As part of their annual two-tier sampling and analysis programme, the Environmental Agency and AquaGib Ltd investigated the following parameters for local potable water and obtained these results.

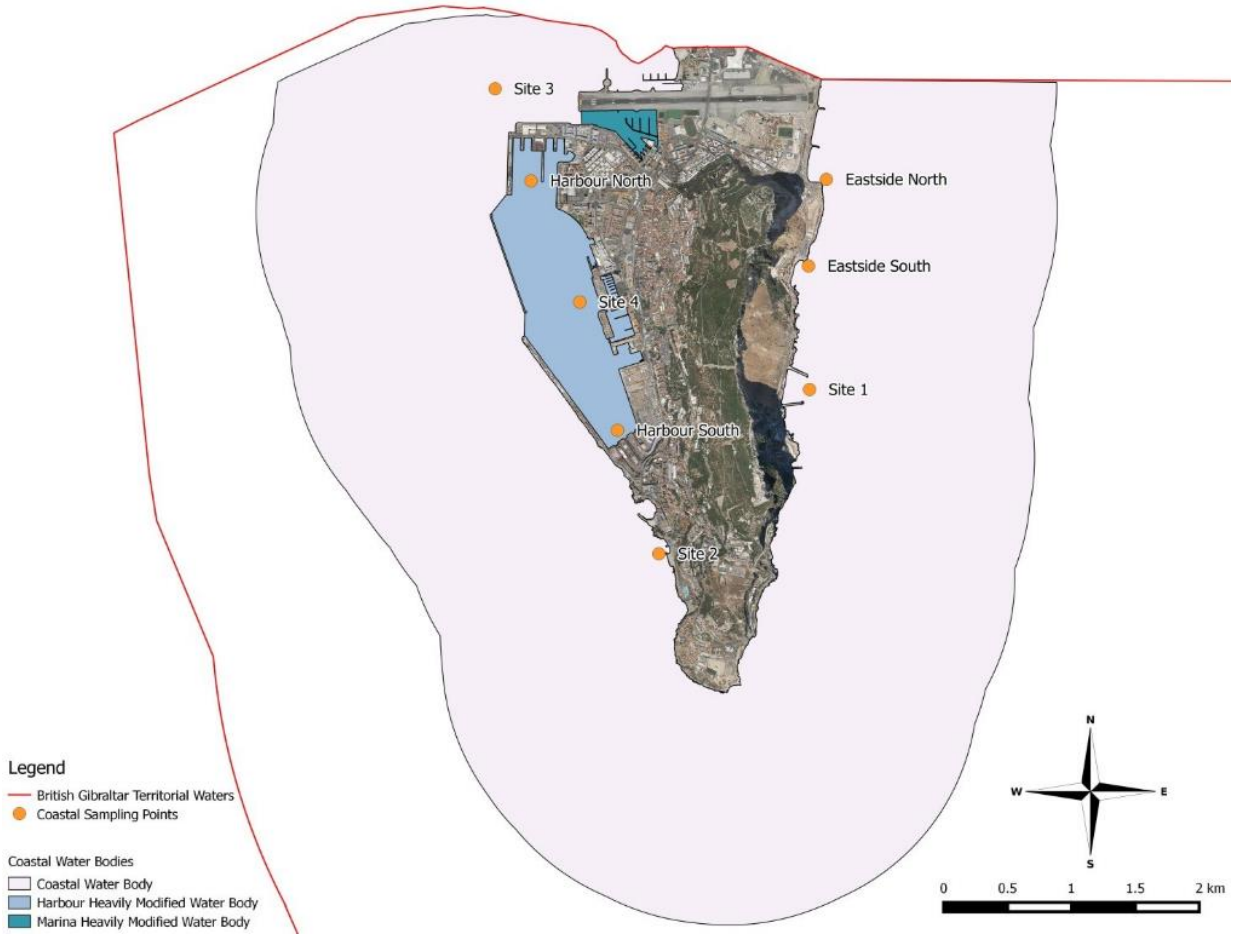
Member State	United kingdom (Gibraltar)				
Year	2017				
Parameter	Numbers of WSZ Monitored	Numbers of WSZ with Non-Compliance	Number of Analyses	Number of Analyses not complying	% of Analyses Complying
Microbiological Parameters					
Escherichia (E.coli)	1	0	10	0	100
Enterococci	1	0	10	0	100
Chemical Parameters					
Antimony	1	0	10	0	100
Arsenic	1	0	10	0	100
Benzene	1	0	10	0	100
Benzo(a)pyrene	1	0	10	0	100
Boron	1	0	10	0	100
Bromate	1	1	10	2	80
Cadmium	1	0	10	0	100
Chromium	1	0	10	0	100
Copper	1	0	10	0	100
Cyanide	1	0	10	0	100
1,2-dichloroethane	1	0	10	0	100
Fluoride	1	0	10	0	100
Lead	1	0	10	0	100
Mercury	1	0	10	0	100
Nickel	1	0	10	0	100
Nitrite in distribution at the tap	1	0	10	0	100
Nitrate/nitrite formula$_3$	1	0	10	0	100
Pesticides – total	1	0	10	0	100
Polycyclic Aromatic Hydrocarbons	1	0	10	0	100
Selenium	1	0	10	0	100
Tetrachloroethane and Trichloroethane	1	0	10	0	100

Trihalomethanes - Total	1	0	10	0	100
Indicator parameters					
Aluminium	1	0	10	0	100
Ammonium	1	0	10	0	100
Chloride	1	0	10	0	100
Colour	1	0	10	0	100
Conductivity	1	0	10	0	100
pH	1	0	10	0	100
Iron	1	0	10	0	100
Manganese	1	0	10	0	100
Odour	1	0	10	0	100
Oxidisability	1	0	10	0	100
Sulphate	1	0	10	0	100
Sodium	1	0	10	0	100
Taste	1	0	10	0	100
Coliform	1	0	10	0	100
Turbidity	1	0	10	0	100

National summary information on drinking water quality in water supply zones exceeding 1000m³ per day as an average or serving more than 5000 persons

Coastal Water Monitoring

Coastal water sampling is carried out by the Department of the Environment, Heritage and Climate Change on a regular basis at the locations shown below.



Coastal water sampling points

In line with the Water Framework Directive (WFD) 2000/60/EC, the following chemical and physio-chemical parameters are monitored at different locations and frequencies throughout the year.

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	
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

Coastal Monthly and Quarterly Recordings for 2017

The following series of tables illustrates 2017 results for coastal monthly and quarterly samples which are all compliant with the relevant environmental quality standards (EQS). Months where data is not available is due to poor weather conditions which prevented samples being obtained.

		Site 1. Sandy Bay	Site 2. Camp Bay	Site 3. Airport	Site 4. Mid Harbour
Date of Sampling		**08-Mar-17**	**08-Mar-17**	**08-Mar-17**	**08-Mar-17**
Analyte	***Units***	**13:00**	**11:38**	**10:45**	**11:45**
Chromium Hexavalent	ug/l	<0.3	<0.3	<0.3	<0.3
Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Copper	ug/l	0.423	<0.2	0.368	0.53
Lead	ug/l	0.074	0.22	0.246	0.532
Nickel	ug/l	<0.3	<0.3	<0.3	<0.3
Zinc	ug/l	0.965	1.07	1.09	1.38
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

Coastal monitoring (March 2017)

		Site 1. Sandy Bay	Site 2. Camp Bay	Site 3. Runway	Site 4. Mid Harbour
Date of Sampling		**30-May-17**		**30-May-17**	**30-May-17**
Analyte	***Units***	**12:30**		**11:00**	**13:30**
Nitrogen as N	mg/l	<0.100		<0.100	<0.100
Ammoniacal Nitrogen, Filtered as N	mg/l	<0.0200		<0.0200	<0.0200
Nitrite, Filtered as N	mg/l	<0.00400		0.0127	<0.00400
Nitrogen : Total Oxidised, Filtered as N	mg/l	<0.100	**Sampling aborted in site 2 due to rough seas**	<0.100	<0.100
Orthophosphate, Filtered as P	mg/l	<0.0100		<0.0100	<0.0100
Phosphorus : Total	mg/l	<0.0200		<0.0200	<0.0200
Chlorophyll, Acetone Extract	ug/l	0.53		0.59	0.71
Solids, Suspended at 105 C	mg/l	5.1		4.9	5.2
Nitrate, Filtered as N	mg/l	<0.100		<0.0873	<0.100

Coastal monitoring (May 2017)

		Site 1 Sandy Bay	Site 2 Camp Bay	Site 3 Airport Runway	Site 4 Mid Harbour
Date of Sampling		**21-Jun-17**	**21-Jun-17**	**21-Jun-17**	**21-Jun-17**
Analyte	***Units***	**11:25**	**13:00**	**13:30**	**12:25**
Nitrogen as N	**mg/l**	<0.1	<0.1	<0.1	<0.1
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**	<0.0200	<0.0200	<0.0200	<0.0200
Chlorophyll, Acetone Extract	**ug/l**	0.61	0.52	1	0.88
Solids, Suspended at 105 C	**mg/l**	3.5	4.9	3.6	<3.00
Nitrate, Filtered as N	**mg/l**	<0.100	<0.100	<0.100	<0.100

Coastal monitoring (June 2017)

		Site 1 Sandy Bay	Site 2 Camp Bay	Site 3 Airport Runway	Site 4 Mid Harbour
Date of Sampling		**12-Sep-17**	**12-Sep-17**	**12-Sep-17**	**12-Sep-17**
Analyte	***Units***	**12:30**	**13:20**	**13:20**	**13:45**
Chromium Hexavalent	**ug/l**	<0.3	<0.3	<0.3	<0.3
Cadmium	**ug/l**	<0.03	<0.03	<0.03	<0.03
Copper	**ug/l**	3.04	0.338	0.527	0.729
Lead	**ug/l**	0.0951	0.124	0.0954	0.179
Nickel	**ug/l**	<0.3	<0.3	<0.3	<0.3
Zinc	**ug/l**	6.38	2.01	2.4	1.29
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

Coastal monitoring (September 2017)

		Site 1 Sandy bay	Site 2 Camp bay	Site 3 Runway Westside	Site 4 Mid Harbour
Date of Sampling		**30-Oct-17**	**30-Oct-17**	**30-Oct-17**	**30-Oct-17**
Analyte	***Units***	**12:00**	**12:25**	**13:00**	**13:30**
Nitrogen as N	**mg/l**	0.112	0.206	0.103	0.197
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**	<0.0200	<0.0200	<0.0200	<0.0200
Chlorophyll, Acetone Extract	**ug/l**	1.3	0.76	1.4	1.2
Solids, Suspended at 105 C	**mg/l**	4	5.5	4	<3.00
Nitrate, Filtered as N	**mg/l**	<0.100	<0.100	<0.100	<0.100

Coastal monitoring (October 2017)

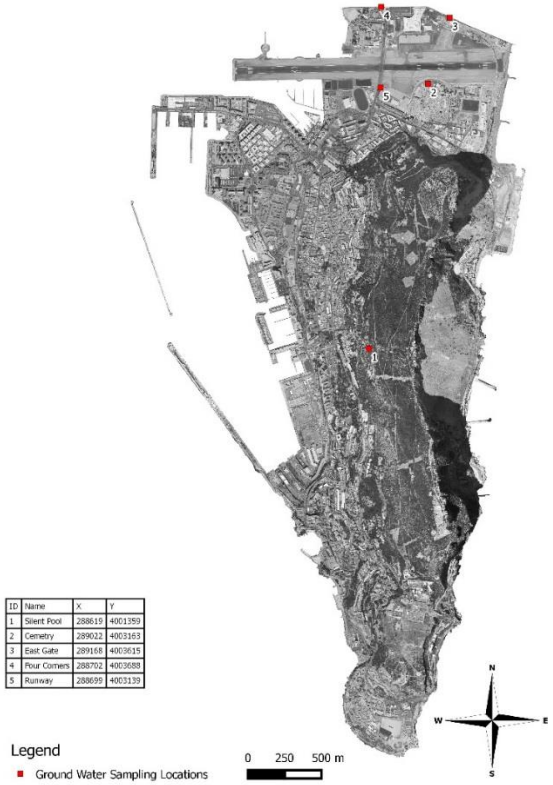
		Site 1 Sandy bay	Site 2 Camp bay	Site 3 Runway Westside	Site 4 Mid Harbour
Date of Sampling		**14-Nov-17**	**14-Nov-17**	**14-Nov-17**	**14-Nov-17**
Analyte	***Units***	**11:00**	**11:30**	**12:00**	**13:30**
Chromium Hexavalent	**ug/l**	<0.3	<0.3	<0.3	<0.3
Cadmium	**ug/l**	<0.03	<0.03	<0.03	<0.03
Copper	**ug/l**	<0.2	0.217	0.258	0.601
Lead	**ug/l**	0.0648	0.0793	0.0659	0.155
Nickel	**ug/l**	<0.3	<0.3	<0.3	0.38
Zinc	**ug/l**	0.973	1.36	1.17	1.33
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
Benzo(b)fluoranthene	**ug/l**	<0.01	<0.01	*	<0.01
Benzo(ghi)perylene	**ug/l**	<0.01	<0.01	*	<0.01
Benzo(k)fluoranthene	**ug/l**	<0.01	<0.01	*	<0.01
Fluoranthene	**ug/l**	<0.01	<0.01	*	<0.01
Chloroform :- {Trichloromethane}	**ug/l**	<0.1	<0.1	<0.1	<0.1

***** Missing results due to bottle breakage in transit to laboratory.

Coastal monitoring (November 2017)

Groundwater Monitoring

Groundwater monitoring takes place at two aquifers on a monthly basis: one located in the Northern Isthmus and one in the Southern bedrock. As part of the monitoring programme, five specific locations have been selected for obtaining samples which can be seen below.



Groundwater sampling points

Results for 2017, which are compliant with EU thresholds, are presented in the following tables.

		Site 1. Silent Pool	Site 2. Cemetery	Site 3. Frontier	Site 4. Four Corners	Site 5. Runway
Date of Sampling		**21-FEB-17**	**21-Feb-17**	**21-Feb-17**	**21-Feb-17**	**21-Feb-17**
Analyte	***Units***	**10:35**	**11:07**	**11:45**	**12:05**	**12:30**
Alkalinity to pH 4.5 as CaCO3	**mg/l**	199	192	211	250	290
Ammoniacal Nitrogen as N	**mg/l**	<0.0300	0.036	<0.0300	<0.0300	<0.0300
Chloride	**mg/l**	1320	37.5	305	44.5	288

Nitrite as N	**mg/l**	<0.00400	0.0156	<0.00400	0.683	<0.00400
Nitrogen : Total Oxidised as N	**mg/l**	6.74	8.34	5.41	8.45	3.91
Carbon, Organic : Total as C :- {TOC}	**mg/l**	1.4	0.9	1.3	2.7	0.9
Solids, Suspended at 105 C	**mg/l**	-	<3	4.4	<3	3.75
Arsenic	**ug/l**	<1	3.88	2.71	10.9	6.93
Cadmium	**ug/l**	<0.1	<0.1	0.477	<0.1	<0.1
Lead	**ug/l**	<2	<2	<2	<2	<2
Zinc	**ug/l**	<5	<5	161	<5	15.8
Calcium	**mg/l**	121	77.3	81.1	79.5	94.2
Magnesium	**mg/l**	97.3	9.4	25.7	18.2	34
Potassium	**mg/l**	25.9	8.39	12.9	17.3	14.5
Sodium	**mg/l**	697	27.5	188	43.7	177
Sulphate as SO4	**mg/l**	203	33.3	80.9	52.8	61
Mercury	**ug/l**	-	<0.01	<0.01	<0.01	<0.01
Bicarbonate as HCO3	**mg/l**	-	234	257	305	354
Nitrate as N	**mg/l**	-	8.32	<5.41	7.77	<3.91

Groundwater monitoring (February 2017)

		Site 1. Silent Pool	**Site 2. Cemetery**	**Site 3. Frontier**	**Site 4. Four Corners**	**Site 5. Runway**
Date of Sampling		**16-May-17 11:37**	**16-May-17 09:44**	**16-May-17 10:16**	**16-May-17 10:38**	**16-May-17 11:00**
Analyte	***Units***					
Alkalinity to pH 4.5 as CaCO3	**mg/l**	204	60	190	245	312
Ammoniacal Nitrogen as N	**mg/l**	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Chloride	**mg/l**	997	195	153	37.5	392
Nitrite as N	**mg/l**	<0.00400	<0.00400	<0.00400	<0.00400	<0.00400
Nitrogen : Total Oxidised as N	**mg/l**	5.5	0.37	5.2	5.02	3
Carbon, Organic :	**mg/l**	1.5	<0.7	1.3	2.5	0.9

Total as C :- {TOC}						
Solids, Suspended at 105 C	**mg/l**	-	<3	<3	<3	3.53
Arsenic	**ug/l**	<1	2.33	6.25	13.3	7.28
Cadmium	**ug/l**	<0.1	<0.1	0.245	<0.1	<0.1
Lead	**ug/l**	<2	<2	<2	<2	4.57
Zinc	**ug/l**	8.67	6.46	107	<5	32.1
Calcium	**mg/l**	111	52.5	64.9	79.7	94.4
Magnesium	**mg/l**	80.9	2.98	17	17.6	39.4
Potassium	**mg/l**	21	3.52	12	16.7	16.1
Sodium	**mg/l**	570	83.5	120	39.7	227
Sulphate as SO4	**mg/l**	162	<10	60.5	45.2	66.6
Mercury	**ug/l**	-	<0.01	<0.01	<0.01	<0.01
Bicarbonate as HCO3	**mg/l**	-	73.2	232	299	381
Nitrate as N	**mg/l**	-	<0.370	<5.20	<5.02	<3.00

Groundwater monitoring (May 2017)

		Site 1 Silent Pool	**Site 2 Cemetery**	**Site 3 Frontier**	**Site 4 Four Corners**	**Site 5 Runway**
Date of Sampling		**09-Aug-17**	**09-Aug-17**	**09-Aug-17**	**09-Aug-17**	**09-Aug-17**
Analyte	***Units***	**11:50**	**10:49**	**09:52**	**10:05**	**10:20**
Alkalinity to pH 4.5 as CaCO3	**mg/l**	215	67	214	269	358
Ammoniacal Nitrogen as N	**mg/l**	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Chloride	**mg/l**	1010	200	185	40.2	596
Nitrite as N	**mg/l**	<0.00400	0.0058	<0.00400	<0.00400	<0.00400
Nitrogen : Total Oxidised as N	**mg/l**	6.31	0.59	2.31	4.7	3.57
Carbon, Organic : Total as C :- {TOC}	**mg/l**	1.1	<0.7	0.8	2.3	1.1
Solids, Suspended at 105 C	**mg/l**	-	3.77	3.12	3.22	10.1
Arsenic	**ug/l**	<1	3.66	2.08	12.7	8.38
Cadmium	**ug/l**	<0.1	<0.1	0.437	<0.1	<0.1
Lead	**ug/l**	<2	<2	3.24	<2	7.28
Zinc	**ug/l**	6.4	13.3	198	<5	36.7
Calcium	**mg/l**	106	56	54.4	80.2	117
Magnesium	**mg/l**	82.9	2.68	17.8	19.5	56.5

Potassium	**mg/l**	21.5	4.01	10.5	15.6	23.3
Sodium	**mg/l**	567	95.1	141	42.2	326
Sulphate as SO4	**mg/l**	161	<10	60.2	50.1	104
Mercury	**ug/l**	-	<0.01	<0.01	<0.01	<0.01
Bicarbonate as HCO3	**mg/l**	-	81.7	261	328	437
Nitrate as N	**mg/l**	-	0.584	<2.31	<4.70	<3.57

Groundwater monitoring (August 2017)

		Site 1 Silent Pool	**Site 2 Cemetery**	**Site 3 Frontier**	**Site 4 Four Corners**	**Site 5 Runway**
Date of Sampling		**19-Oct-17**	**19-Oct-17**	**19-Oct-17**	**19-Oct-17**	**19-Oct-17**
Analyte	***Units***	**12:45**	**10:00**	**10:30**	**10:55**	**11:55**
Alkalinity to pH 4.5 as CaCO3	**mg/l**	195	65	135	255	363
Ammoniacal Nitrogen as N	**mg/l**	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Chloride	**mg/l**	1080	190	122	42.3	194
Nitrite as N	**mg/l**	<0.00400	<0.00400	<0.00400	<0.00400	<0.00400
Nitrogen : Total Oxidised as N	**mg/l**	6.04	0.82	0.94	3.08	4.46
Carbon, Organic : Total as C :- {TOC}	**mg/l**	1.2	<0.7	0.9	2.5	0.9
Solids, Suspended at 105 C	**mg/l**	-	4.57	3.97	6.77	5.27
Arsenic	**ug/l**	<1	2.77	1.87	13.8	7.35
Cadmium	**ug/l**	<0.1	<0.1	0.411	<0.1	<0.1
Lead	**ug/l**	<2	<2	2.29	<2	4.22
Zinc	**ug/l**	9.02	17.7	194	<5	43.5
Calcium	**mg/l**	112	57.8	62.5	81.4	98
Magnesium	**mg/l**	82.5	2.68	20.7	20.1	38.8
Potassium	**mg/l**	25.7	4.92	12.2	15.1	16.8
Sodium	**mg/l**	586	95.8	77.1	43.6	155
Sulphate as SO4	**mg/l**	177	<10	40.1	54.6	50.1
Mercury	**ug/l**	-	<0.01	<0.01	<0.01	0.0109
Bicarbonate as HCO3	**mg/l**	-	79.3	165	311	443
Nitrate as N	**mg/l**	-	<0.820	<0.940	<3.08	<4.46

Groundwater monitoring (October 2017)

3. Habitats

Birds

Nesting Birds of Prey

The Gibraltar Ornithological and Natural History Society (GONHS) conducts bird of prey surveys during the breeding season, with records being kept specifically on the nesting of Peregrines *Falco peregrinus,* Common Kestrel *Falco tinnunculus,* and Lesser Kestrel *Falco naumanni.* Records for 2017 can be seen below.

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
2015	4	7
2016	1	7
2017	1	8

Pairs of Lesser Kestrel & Common Kestrel in Gibraltar

Peregrine Falcon (young fledged by site)

Year	North face	Catalan Bay	Both Worlds	Oil Tanks	Med Steps	Camp Bay	Mosque	Apes Den	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		0		6
2015	2	2	0	3		3	0	0	10
2016	3	3	3	0			3	2	14
2017	0	3	3	0	3	0	3	0	12

Blank entries denote no pairs present at this site

Locations and breeding success of Peregrines in Gibraltar

Yellow-legged Gulls

As with previous years, licensed culling of yellow-legged gulls continues to take place. The table below provides an indication of the demographics being targeted, and shows that 3734 yellow-legged gulls were culled in 2017. This is 87 more than the previous year.

	Adults	1st/yr	2nd/yr	3rd/yr	Juvenile	Total
January	306	2	1	6	0	315
February	317	17	0	0	0	334
March	602	2	10	43	0	657
April	427	0	27	38	0	492
May	625	0	12	7	1	645
June	408	13	12	10	255	698
July	109	0	0	2	155	266
August (counts)	6	0	0	0	0	6
September (counts)	7	0	0	0	0	7
October (counts)	12	1	0	4	0	17
November	162	1	0	2	1	166
December	128	2	0	1	0	131
Total	3109	38	62	113	412	3734

Total Yellow-legged Gulls culled throughout 2017

Mammals

Barbary Macaques

In 2017, the Barbary macaque population continued to grow slowly as has been the trend since exportation last took place in 2014. Although deaths have been on the increase, the similarly high birth rate has ensured the population's steady growth. Laparoscopic sterilisation of selected females was introduced in 2017, with 12 females being processed. This is expected to result in a reduced number of births in 2018.

Year	Population	Deaths	Births	Infant Deaths
2013	209	40	33	6
2014	196	27 (30 exported)	26	7
2015	158	7	39	3
2016	184	8	38	7
2017	198	28	27	8

Barbary Macaque demographics

The table below provides an indication of the current distribution of macaques around Gibraltar.

Population estimate at end of 2017	
Rock Gun	24
Middle Hill	23
Prince Philip's Arch	42
Cable Car Station	30
Ape's Den	28
Royal Anglian Way	18
Incinerator	22
Farringdon	9
Caleta Hotel	2
Total	198

Barbary Macaque distribution

4. Waste

Hazardous Waste

Hazardous waste materials are stored under strict licence conditions and then processed for trans-frontier shipment where they can be adequately disposed of. Typically consisting of waste oils and asbestos containing products, the table below shows a breakdown of total exported hazardous wastes in 2017.

Waste code(s)	Description of Waste	Totals (Metric Tonnes)
06 02 04*	Sodium and Potassium Hydroxide	2.1
08 01 11*	Waste paint and varnish containing dangerous substances	136.308
10 01 04*	Oily fly ash and boiler dust	8.75
12 01 16*	Waste blasting material containing dangerous substances	1880.23
13 05 02*	Sludges from oil/waste Separators	5.78
13 07 03*	Other Fuels (Including Mixtures)	24912.775
14 06 01*	Chlorofluorocarbons, HCFC, HFC	0.11
14 06 03*	Other solvents and solvent mixtures	0.25
15 01 10*	Packaging containing residues of or contaminated by dangerous substances	4.057
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified) wiping cloths, protective clothing contaminated by dangerous substances.	56.019
16 01 07*	Oil Filters	3.567
16 02 11*	Discarded equipment containing Chlorofluorocarbons, HCFC, HFC	84.96
16 02 13*	Discarded equipment containing hazardous components other than those mentioned in 16 02 09 to 16 02 12	6928.04
16 03 05*	Organic wastes containing dangerous substances	2.7
16 05 04*	Gases in pressure valves (including halons) containing dangerous substances	0.1

16 05 06*	Laboratory chemicals consisting of or containing dangerous substances including mixtures of laboratory chemicals	0.55
16 06 01*	Lead Batteries	25.52
16 07 08*	Wastes containing oil	18.14
16 10 01*	Aqueous liquid waste	138.663
17 05 03*	Soils and stones containing dangerous substances	79.28
17 06 03*	Insulation materials containing or consisting of dangerous substances	2.2
17 06 05*	Construction materials containing asbestos	118.79
18 01 03*	Waste whose collection and disposal is subject to special requirements to prevent infection	52.5
18 01 08*	Cytotoxic and cytostatic medicines	0.77
18 01 09	Medicines other than those mentioned in 18 01 08	1.18
19 01 03*	Fly Ash containing dangerous substances	2
19 08 11*	Sludges containing dangerous substances	24
20 01 21*	Fluorescent tubes and other mercury containing waste	2.8
20 01 23*	Discarded equipment containing chlofluorocarbons	0.2
20 01 33*	Batteries and accumulators specified in codes 16 06 01, 16 06 02 or 16 06 03 and batteries and accumulators unsorted containing these batteries	0.5
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 0121 and 20 0123 containing hazardous components	0.15
20 01 36	Discarded electrical and electronic equipment other than those mentioned IN 20 01 21 20 01 and 20 01 35	9.3
20 03 01 20 03 03	Mixed Municipal Waste Street cleaning residues	17862.82
20 03 99	Municipal waste not otherwise specified	8449.608

Trans-frontier shipments of hazardous waste in 2017

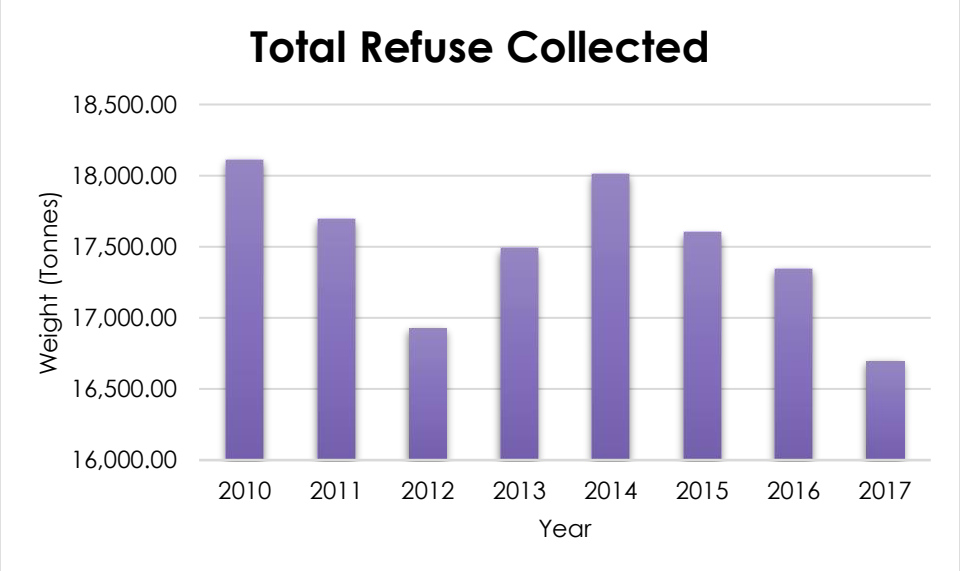
Municipal Waste

In the table below, municipal waste data comprising of general refuse and household waste is shown.

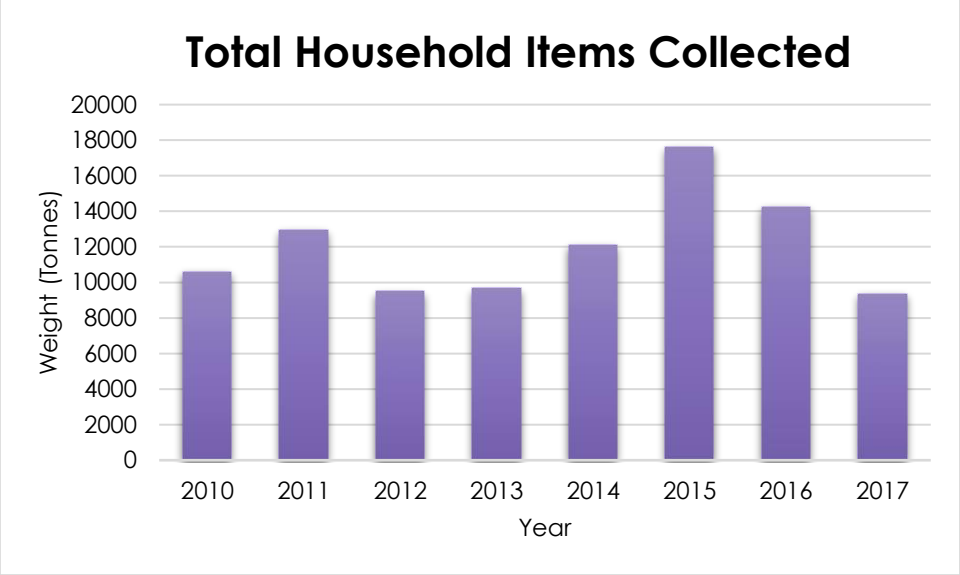
2017	Refuse	Household	Total Waste Per Month
Month	**Weight (TONs)**	**Weight (TONs)**	**Weight (TONs)**
January	1,128.64	12.8	1,141.44
February	1,277.14	23.38	1,300.52
March	1,622.86	339.54	1,962.4
April	1,260.60	553.63	1,814.23
May	1,685.32	777.6	2,462.92
June	1,398.72	1235.36	2,634.08
July	1,400.24	966.42	2,366.66
August	1,622.50	1,064.32	2,686.82
September	875.84	1,098	1,973.84
October	1,644.26	1,140.76	2,785.02
November	1,485.32	1,242.59	2,727.91
December	1,296.78	889.32	2,186.1
Total	16,698.22	9,343.72	26,041.94

Municipal waste in Gibraltar in 2017

Examining results in the charts below, it is clear that Gibraltar continues to significantly decrease the amount of municipal waste being produced each year. In 2016, household waste reached a total of 14,253.94 tons, and has since then decreased by 4,910.22 tons to 9,343.72 in 2017. With reductions also taking place for general refuse, total municipal waste levels have reduced by 5,555.33 tons in the year 2017.



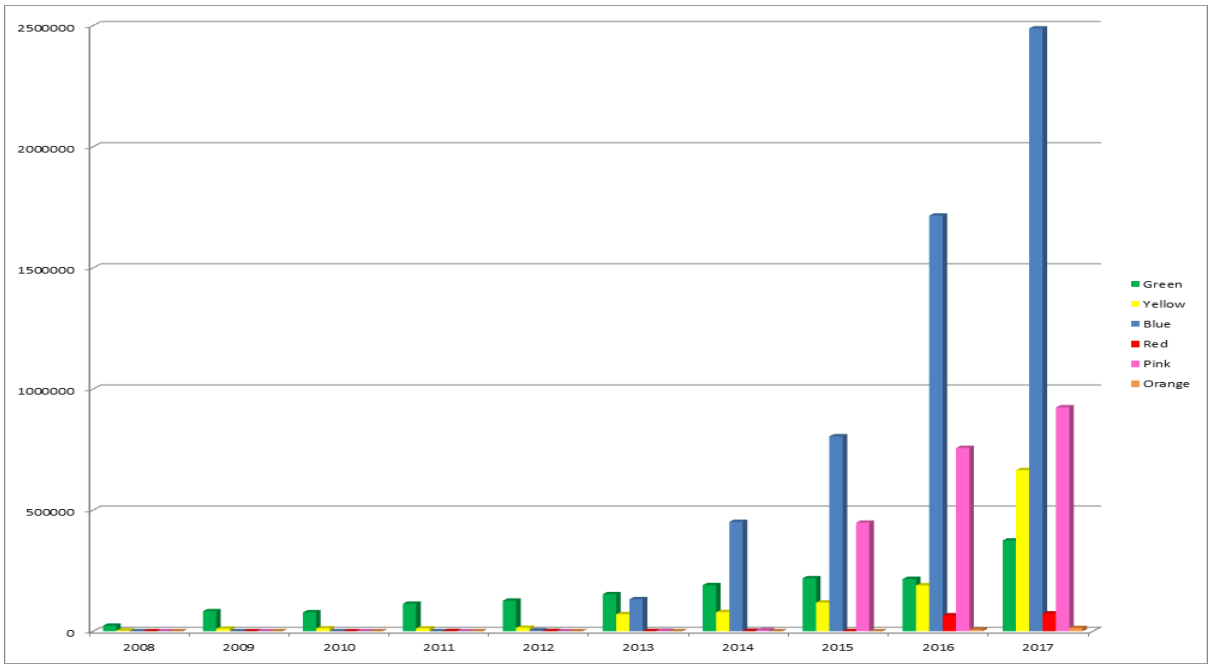
Annual refuse total comparison (2010 – 2017)



Annual bulky items total comparison (2010 – 2017)

Recycling

In recent years, kerbside recycling facilities provided across Gibraltar have expanded and seen the adoption of new waste streams. To reflect this growth, the quantity of waste being recycled locally has steadily increased most especially with paper (blue bin), plastic (yellow bin), and Waste Electrical and Electronic Equipment (WEEE) (pink bin).



Recycling quantities (2008-2017)

Year	Green Bin	Yellow Bin	Blue Bin	Red Bin	Pink Bin	Orange Bin
2017	375,000	665,060	2,488,646	73,780	924,232	13,340

*Weight given in Kilograms (Kgs)

Recycling quantities for 2017

WEEE

Due to the mixed and often hazardous nature of WEEE, regulations are in place to ensure that all categories of this waste are responsibly handled, treated and disposed of where necessary. The table below highlights which categories are encompassed under this umbrella of enforcement, and details how much is being treated and recovered to create a new life cycle.

Year: 2017	Imported		Collected		Sent for treatment		Recovery
Categories	**Quantity (No.)**	**Weight (tonnes)**	**Quantity (No.)**	**Weight (tonnes)**	**Quantity (No.)**	**Weight (tonnes)**	**%**
Large Household appliances	773	43.6776	3423	98.744	17098	547.264	226.0747
Small Household appliances	3963	91.2908	384	1.968	4581	37.428	2.155748
IT and Telecoms Equipment	15380	41.1962	3601.021	408.0653	15122	187.639	990.5411
Consumer Equipment	1877	5.86185	866	5.7633	3052	30.374	98.31879
Lighting equipment	3175	3175	913	5.7225	3696	17.911	0.180236
Electrical and electronic tools	312	12.0202	15	0.069	492	2.89	0.574034
Toys, Leisure & Sports Equipment	0	6.898	32	0.666	275	4.404	9.654972
Medical devices	35	0.472	2	0.005	170	0.386	1.059322
Monitoring & Control Instruments	14	1.157	24	0.04	146	0.787	3.457217
Automatic dispensers	14	1.157	10	0.02	79	0.325	1.728608
Totals	**25543**	**3378.731**	**9270.021**	**521.0631**	**44711**	**829.408**	**1333.745**

WEEE movements and recovery in Gibraltar 2017

Clinical Waste

Results for total clinical waste collected, transported and incinerated locally during 2017 are as follows.

	Year:		2017
Month	**No. of Containers**	**Total Litres**	**Total Weight (Kgs)**
January	5185	311100	38887.5
February	4515	270900	33862.5
March	4901	294060	36757.5
April	4502	270120	33765
May	5376	322560	40320
June	4938	296280	37035
July	4864	291840	36480
August	5128	307680	38460
September	4827	289260	36202.5
October	5550	333000	41625
November	5219	313140	39142.5
December	4888	293280	36660
Total	59,893	3,593,580	449,197.5

Clinical waste collected 2017

	Year:		2017
Month	**No. of Containers**	**Total Litres**	**Total Weight (Kgs)**
January	4353	261180	32647.5
February	3647	218820	27352.5
March	4564	273840	34230
April	4148	248880	31110
May	4485	269100	33637.5
June	4385	263100	32887.5
July	4291	257460	32182.5
August	5081	304860	38107.5
September	4188	251280	31410
October	4613	276780	34597.5
November	4407	264420	33052.5
December	3494	209640	26205
Total	51,656	3,099,360	387,420

Clinical waste locally incinerated 2017

	Year:		2016
Month	**No. of Containers**	**Total Litres**	**Total Weight (Kgs)**
January	864	51840	6480

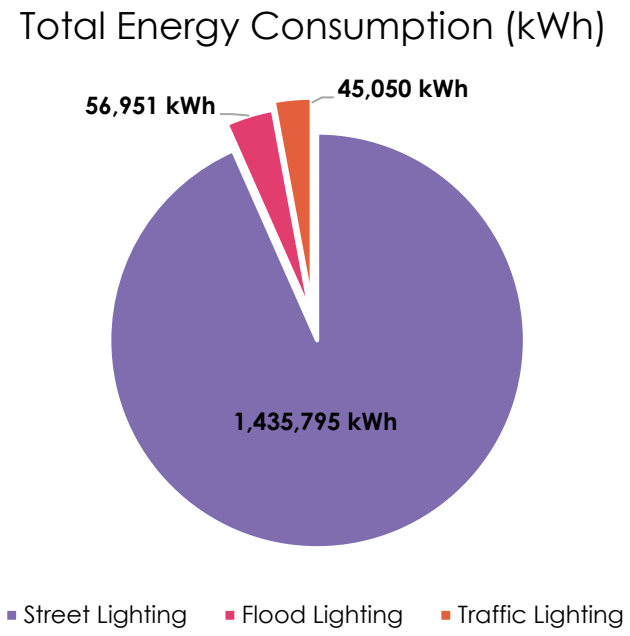
February	854	51240	6405
March	864	51840	6480
April	864	51840	6480
May	0	0	0
June	854	51240	6405
July	771	46260	5782.5
August	432	25920	3240
September	347	20820	2602.5
October	417	25020	3127.5
November	1023	61380	7672.5
December	735	44100	5512.5
Total	8025	481,500	60,187.5

Clinical waste exported for incineration 2017

5. Energy

Lighting

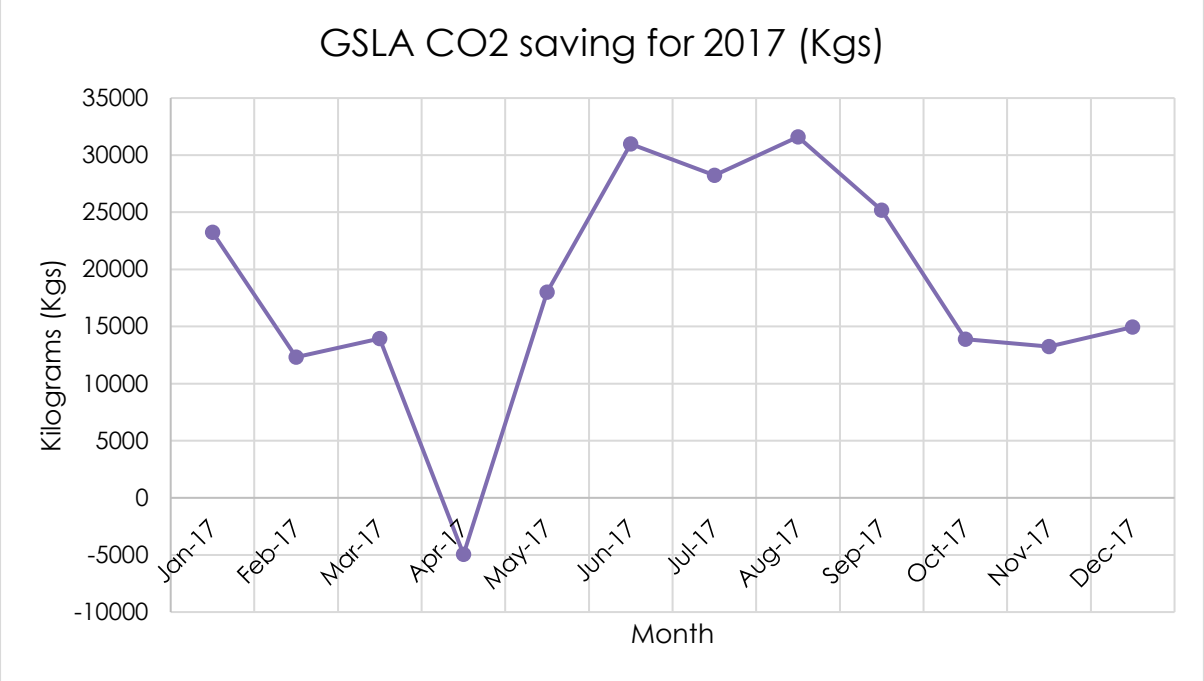
As part of H.M. Government's initiative to improve energy efficiency, the Gibraltar Electricity Authority (GEA) has systematically carried out the installation of LED lighting throughout different sectors to reduce energy consumption and consequently carbon emissions. Below is shown 2017 energy consumption totals for street, flood and traffic lighting.



Solar Energy

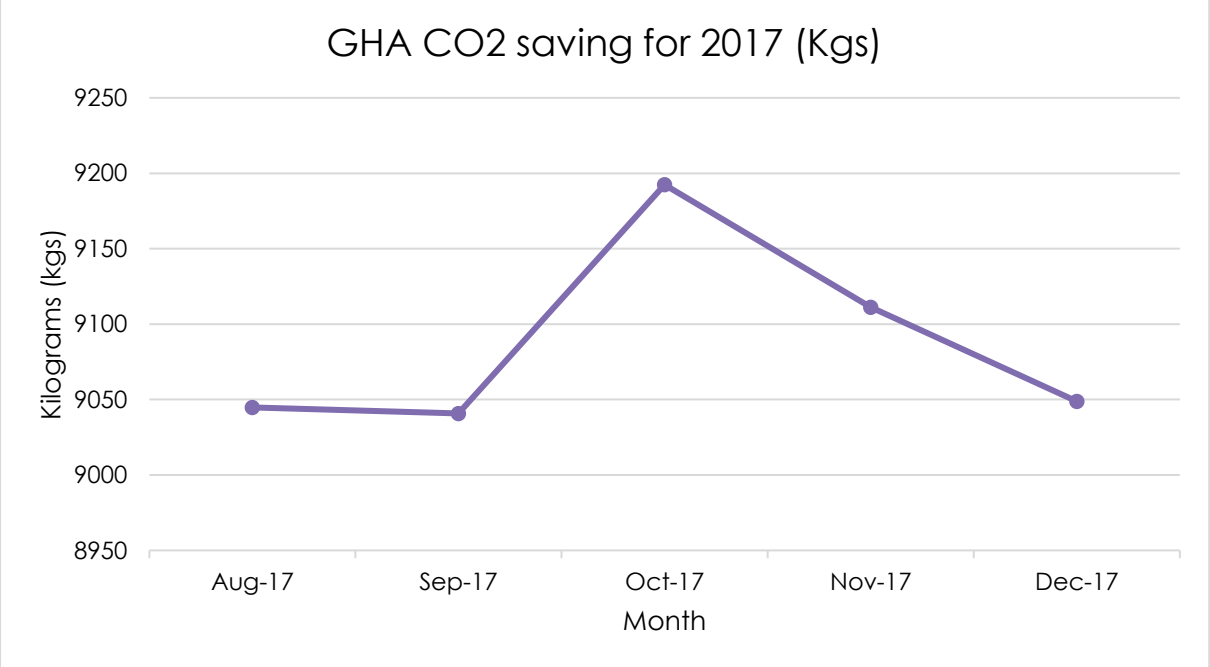
In line with EU targets for sourcing 20% of energy by 2020, H.M. Government of Gibraltar has rolled out a number of projects aimed at reducing carbon emissions from energy consumption. Two sites that form part of this initiative are the GSLA pool and more recently, St Bernard's Hospital (GHA) which are both equipped with solar thermal systems.

The following tables illustrate carbon dioxide (CO2) savings achieved at both sites on a monthly basis. Examining GSLA data, the expected trend of a lull in savings during winter months, and an increase during summer months is noted. These CO2 emission savings peaked in August 2017 with 31,600 CO2 Kgs, the equivalent of taking 141 cars off the road for one year.



GSLA CO2 saving for 2017 (Kgs)

Below, results for St Bernard's Hospital are shown as from August 2017 when the systems began operation. Reaching a peak in October of that year, the highest savings achieved to date total 9,192.4 CO2 Kgs, the equivalent of taking 41 cars off the road for one year.



GHA CO2 saving for 2017 (Kgs)