



Department of the Environment,
Sustainability, Climate Change
and Heritage

HM Government of Gibraltar

H.M Government of Gibraltar Environmental Statistics Report 2019



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1. Air Quality

1.1 Gibraltarairquality.gi

In Gibraltar, a formalised air quality monitoring programme is in operation consisting of a variety of methodologies, and taking place at selected locations. Developed in accordance with European Union (EU) directive requirements, air quality in Gibraltar since 2008 has been monitored using passive sampling, active (semi-automatic) sampling, and automatic point monitoring. Deployed at sites throughout Gibraltar, these work to provide a comprehensive understanding of variations in air quality according to location (urban/suburban), time, and season.

With some results available in real time, these as well as historical records, can be accessed by the public at www.gibraltarairquality.gi. The table below provides a record of activity on Gibraltar's air quality website in 2019.

Month	Number of Visits	Unique Visitors	Page Views
Jan-19	460	154	1,317
Feb-19	391	182	1,129
Mar-19	363	161	1,519
Apr-19	273	128	873
May-19	403	180	1,441
Jun-19	448	206	1,281
Jul-19	297	129	920
Aug-19	492	232	2,115
Sep-19	407	154	1,288
Oct-19	542	245	1,259
Nov-19	476	199	1,285
Dec-19	465	156	1,309

Gibraltar Air Quality Hits for 2019.

1.2 Annual Automatic Data Summary Reports

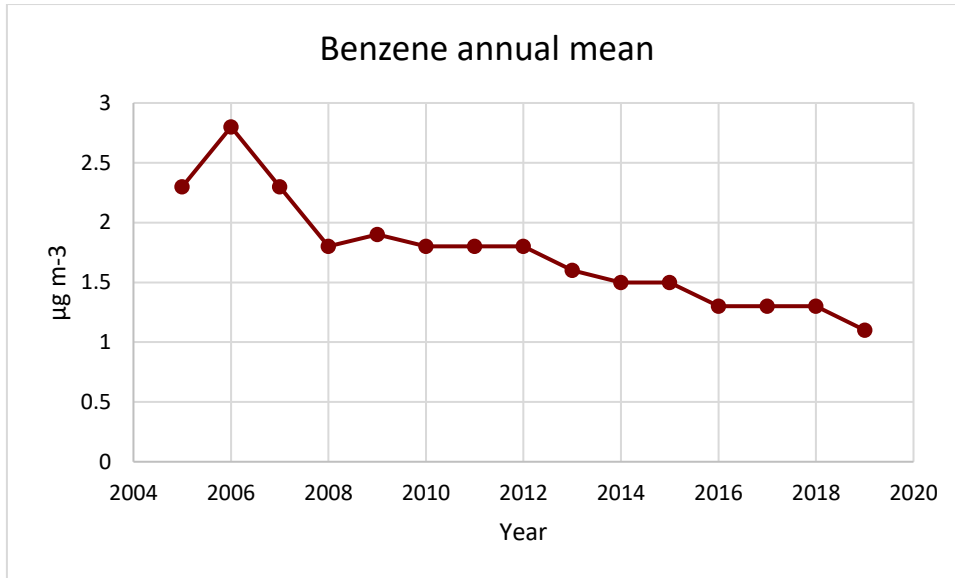
1.2.1 Rosia Road: 1st January to 31st December 2019

At Rosia Road, concentrations for pollutants such as benzene, carbon monoxide (CO), nitrogen dioxide (NO₂), and sulphur dioxide (SO₂) are logged. Records for 2019 are as follows:

1.2.1.1 Benzene

POLLUTANT	BENZ
Maximum hourly mean	36.1 µg m ⁻³
Maximum running 8-hour mean	12.1 µg m ⁻³
Maximum running 24-hour mean	5.8 µg m ⁻³
Maximum daily mean	5.2 µg m ⁻³
Data capture	90.2 %

Rosia Road benzene results 2019.

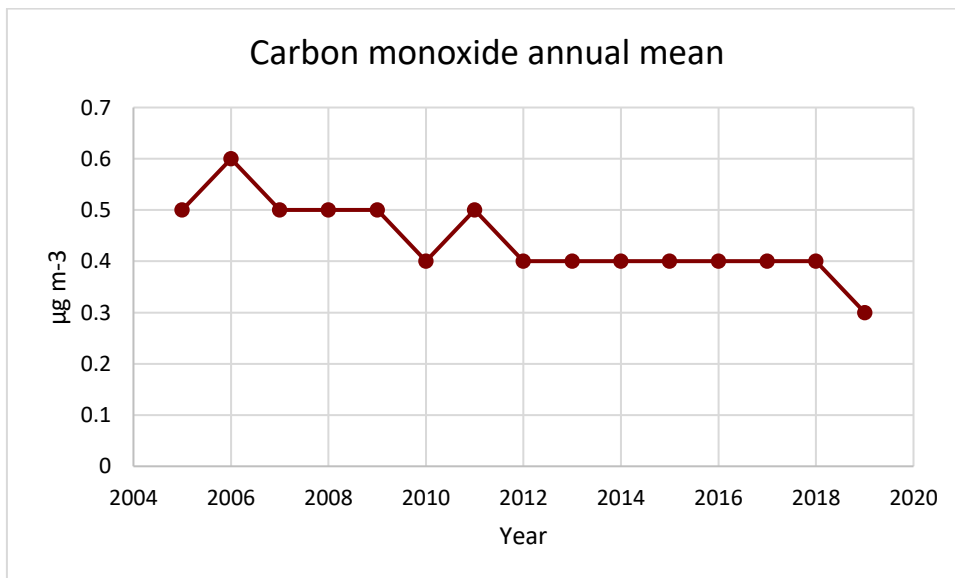


Rosia Road benzene annual mean.

1.2.1.2 Carbon Monoxide

POLLUTANT	CO
Maximum hourly mean	3.2 µg m ⁻³
Maximum running 8-hour mean	1.3 µg m ⁻³
Maximum running 24-hour mean	0.9 µg m ⁻³
Maximum daily mean	0.8 µg m ⁻³
Data capture	84.9 %

Rosia Road carbon monoxide monitored results 2019.

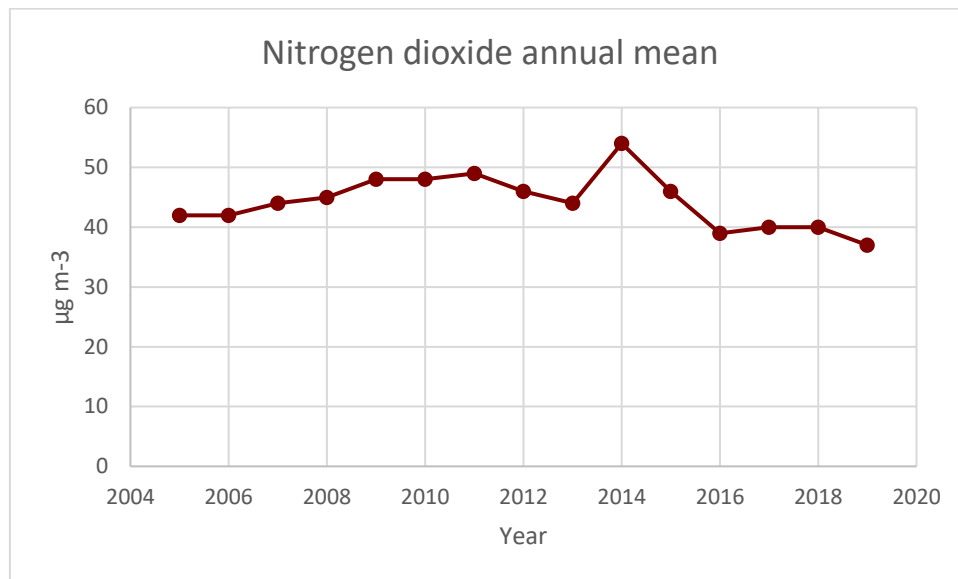


Rosia Road carbon monoxide annual mean.

1.2.1.3 Nitrogen Dioxide

POLLUTANT	NO ₂
Maximum hourly mean	145 µg m ⁻³
Maximum running 8-hour mean	95 µg m ⁻³
Maximum running 24-hour mean	84 µg m ⁻³
Maximum daily mean	75 µg m ⁻³
Data capture	90 %

Rosia Road nitrogen dioxide monitored results 2019.

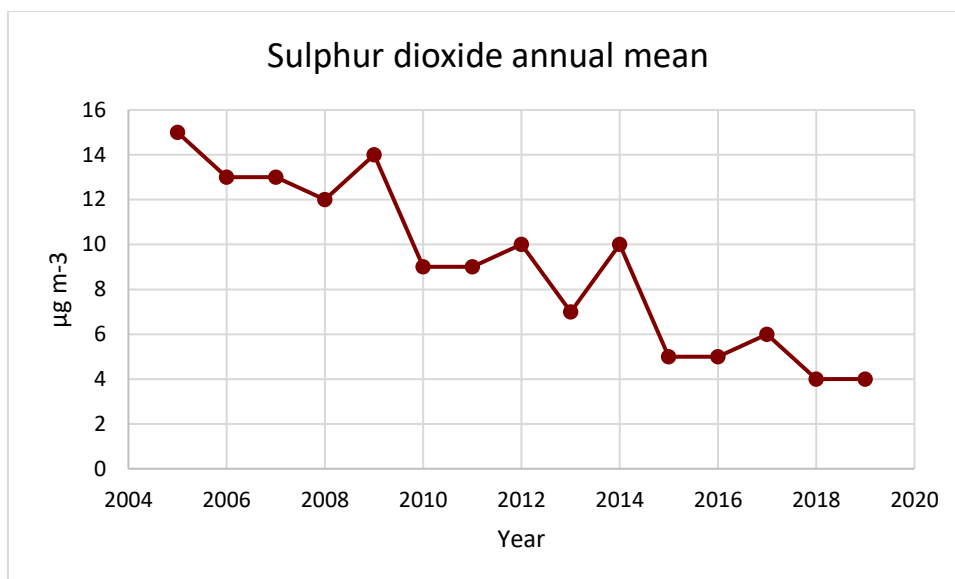


Rosia Road nitrogen dioxide annual mean.

1.2.1.4 Sulphur Dioxide

POLLUTANT	SO ₂
Maximum hourly mean	µg m ⁻³
Maximum running 8-hour mean	µg m ⁻³
Maximum running 24-hour mean	µg m ⁻³
Maximum daily mean	µg m ⁻³
Data capture	98 %

Rosia Road sulphur dioxide monitored results 2019.



Rosia Road sulphur dioxide annual mean.

1.2.2 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 2019.

No threshold exceedances were detected for Rosia Road in 2019.

1.2.3 South District Power Stations

The table below highlights the engine operating hours of South District power stations in 2019.

Engine Hours	
	Total 2019
GMES EX MOD Power Station (sets 7-9)	165.5 (decommissioned 31.08.19)
GMES South Temp. Gen. (Sets 21-30)	35,344
GMES SO Energy Temp (turbines 1+2)	192 (decommissioned 28.02.19)
Portman Temp. Gen. (Sets 1-6)	10,060

South District Power Stations engine hours in 2019.

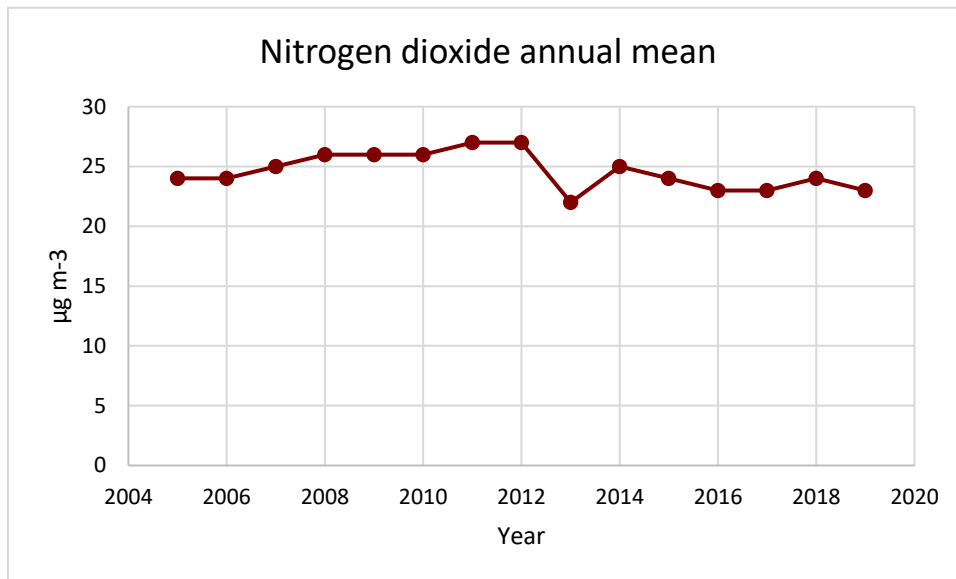
1.2.4 Bleak House: 1st January to 31st December 2019

At Bleak House, nitrogen dioxide and ozone (O₃) concentrations are monitored. Results for the suburban area in 2019 are as follows:

1.2.4.1 Nitrogen Dioxide

POLLUTANT	NO ₂
Maximum hourly mean	111 µg m ⁻³
Maximum running 8-hour mean	95 µg m ⁻³
Maximum running 24-hour mean	95 µg m ⁻³
Maximum daily mean	60 µg m ⁻³
Data capture	94 %

Bleak House nitrogen dioxide monitored results 2019.

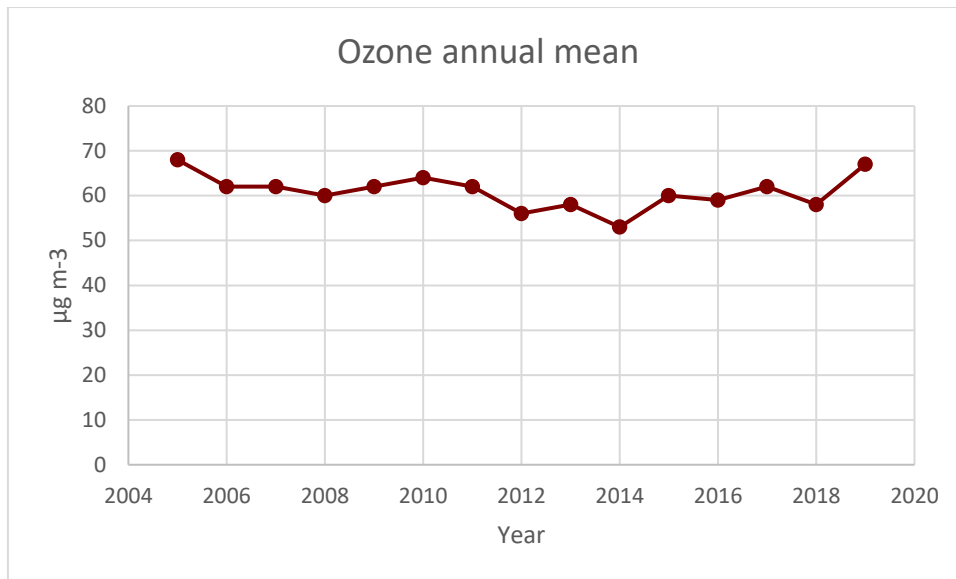


Bleak House nitrogen dioxide annual mean.

1.2.4.2 Ozone

POLLUTANT	O ₃
Maximum hourly mean	161 µg m ⁻³
Maximum running 8-hour mean	154 µg m ⁻³
Maximum running 24-hour mean	146 µg m ⁻³
Maximum daily mean	68 µg m ⁻³
Data capture	81 %

Bleak House ozone monitored results 2019.



Bleak House ozone annual mean.

1.2.5 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	29

Bleak House pollutant exceedances for 2019.

Data collected for 2019 shows that there were a total of 29 incidences of Ozone exceedance at Bleak House. 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.

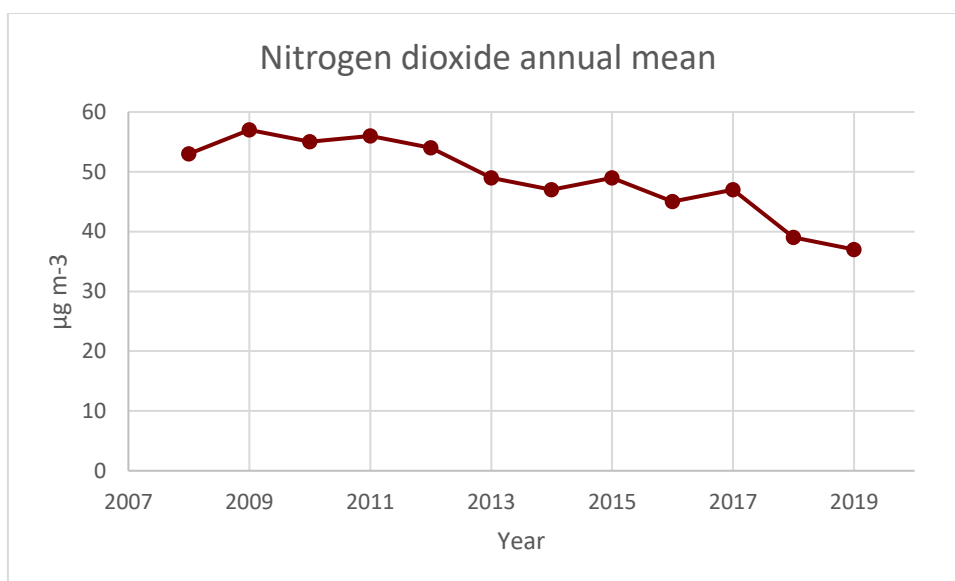
1.2.6 Witham’s Road: 1st January to 31st December 2019

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.

1.2.6.1 Nitrogen Dioxide

POLLUTANT	NO ₂
Maximum hourly mean	124 µg m ⁻³
Maximum running 8-hour mean	97 µg m ⁻³
Maximum running 24-hour mean	82 µg m ⁻³
Maximum daily mean	69 µg m ⁻³
Data capture	88 %

Witham’s Road nitrogen dioxide monitored results 2019.



Witham's Road nitrogen dioxide annual mean.

1.2.7 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

Witham's road pollutant exceedances for 2019.

In 2019, no threshold exceedances were recorded at Witham's road.

1.3 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. The table below provides an indication on Gibraltar's percentage of data capture, compared to that of the UK.

2019	CO	NO2	O3	PM10	PM25	SO2	Total
Number of Stations	7	158	76	89	82	27	175
Number of stations < 85 %	4	13	8	9	7	11	16
Number of stations < 90%	4	22	12	14	14	14	30
Network Mean (%) (UK)	86.2	94.8	94.3	93.6	84.5	84.5	93.8
Gibraltar Network Mean (%)	85.0	90.7	81.0	79.0	79.0	98.0	85.5

Data capture 2019.

1.4 Compliance with Air Quality Limit Values

To ensure compliance with air quality limit values, it is necessary to compare gathered data with relevant policy thresholds. 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	1.3 mg m ⁻³

Automatic measurement for CO in 2019.

Air Quality Objective for NO ₂	Recorded Annual Mean
40 µg m ⁻³	37 µg m ⁻³ (Rosia Road) 37 µg m ⁻³ (Witham's Road) 23 µg m ⁻³ (Bleak House)

Recorded annual mean for NO₂ in 2019.

Air Quality Objective for NO ₂ (1 hour mean)	Recorded exceedances
200 µg m ⁻³ not to be exceeded more than 18 times per year	0 (Rosia Road) 0 (Witham's Road) 0 (Bleak House)

Exceedances recorded for one hour mean for Nitrogen Dioxide in 2019.

Air Quality Objective for SO ₂ (Daily Mean)	Recorded exceedances
125 µg m ⁻³ not to be exceeded more than 3 times per year	0
350 µg m ⁻³ not to be exceeded more than 24 times per year	0

Recorded daily and hourly exceedances for sulphur dioxide in 2019.

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 2019.

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.	154 µg m ⁻³ Target exceeded 29 times in 2019

Maximum rolling 8-hour mean for Ozone in 2019.

1.5 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.

1.5.1 Lead

Air Quality Objective for Lead (measured as an annual mean)	Recorded Annual Mean
0.5 $\mu\text{g m}^{-3}$	0.0056 $\mu\text{g m}^{-3}$ (Rosia Road) 0.0057 $\mu\text{g m}^{-3}$ (Bleak House)

Recorded annual mean for Lead in 2019.

1.5.2 Particulate Matter (PM₁₀)

Air Quality Objective for PM ₁₀ (measured as an annual mean)	Recorded Annual Mean
40 $\mu\text{g m}^{-3}$	26 $\mu\text{g m}^{-3}$ (Rosia Road) 25 $\mu\text{g m}^{-3}$ (Bleak House)
Air Quality Objective for PM ₁₀ (measured as a daily mean)	No. of exceedances of maximum daily mean
50 $\mu\text{g m}^{-3}$ not to be exceeded more than 35 times in a year	1 (Rosia Road) 3 (Bleak House)

PM₁₀ recorded annual mean and compliance in 2019.

	2011	2012	2013	2014	2015	2016	2017	2018	2019
% Data Capture	85	90	73	82	94	93	81	86	75
Annual Mean PM ₁₀ (40 $\mu\text{g m}^{-3}$)*	34	34	36	36	31	28	28	27	26
Max. 24-hour mean PM ₁₀	65	83	88	155	41	41	102	39	36
Days > 50 $\mu\text{g m}^{-3}$ (35 day limit)*	25	18	15	17	16	11	11	11	1

Breakdown of PM₁₀ statistics for Rosia Road.

1.5.3 Particulate Matter (PM_{2.5})

Air Quality Objective for PM _{2.5} (measured as an annual mean)	Recorded Annual Mean
20 $\mu\text{g m}^{-3}$	12 $\mu\text{g m}^{-3}$

PM_{2.5} recorded annual mean for 2019.

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

Pollutant	Parameter	Target Value	Recorded Average
Arsenic	Annual average	6 ng m ⁻³	1.2 ng m ⁻³ (Rosia Road)
			1.2 ng m ⁻³ (Bleak House)
Cadmium	Annual average	5 ng m ⁻³	1.6 ng m ⁻³ (Rosia Road)
			1.5 ng m ⁻³ (Bleak House)
Nickel	Annual average	20 ng m ⁻³	12 ng m ⁻³ (Rosia Road)
			13 ng m ⁻³ (Bleak House)
BAP	Annual average	1 ng m ⁻³	0.04 ng m ⁻³ (Rosia Road)

4th Daughter Directive pollutant recordings for 2019.

1.6 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.

1.6.1 Summary of Hydrocarbon Results

Below, 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	2018 Benzene (µg m ⁻³)	2019 Benzene (µg m ⁻³)	Difference
gib1	Rosia Road	1	1	0
gib15	Catalan Bay Road	0.5	0.4	-0.1
gib16	Laguna Estate	0.6	0.7	0.1
gib17	Kings Lines Fuel Depot	0.8	0.7	-0.1
gib18	Moorish Castle Estate	0.5	0.7	0.2
gib19	North Mole	0.9	0.8	-0.1
gib2	Bleak House	0.4	0.5	0.1
gib20	Sundial Roundabout	1.1	1.1	0
gib21	Anchorage Rosia Road	0.6	0.6	0
gib3	Jumpers	0.8	1	0.2
gib30	Governors Meadow House	0.5	0.6	0.1
gib4	Devils Tower Road	0.6	0.6	0
gib5	Glacis Road	1.3	1.3	0
gib6	Queensway	1.1	1	-0.1

gib7 Harbour Views 0.6 0.7 0.1

Average hydrocarbon concentrations for Benzene 2019

Compliance across all sites was achieved with readings measuring well below the 5 µg m⁻³ threshold.

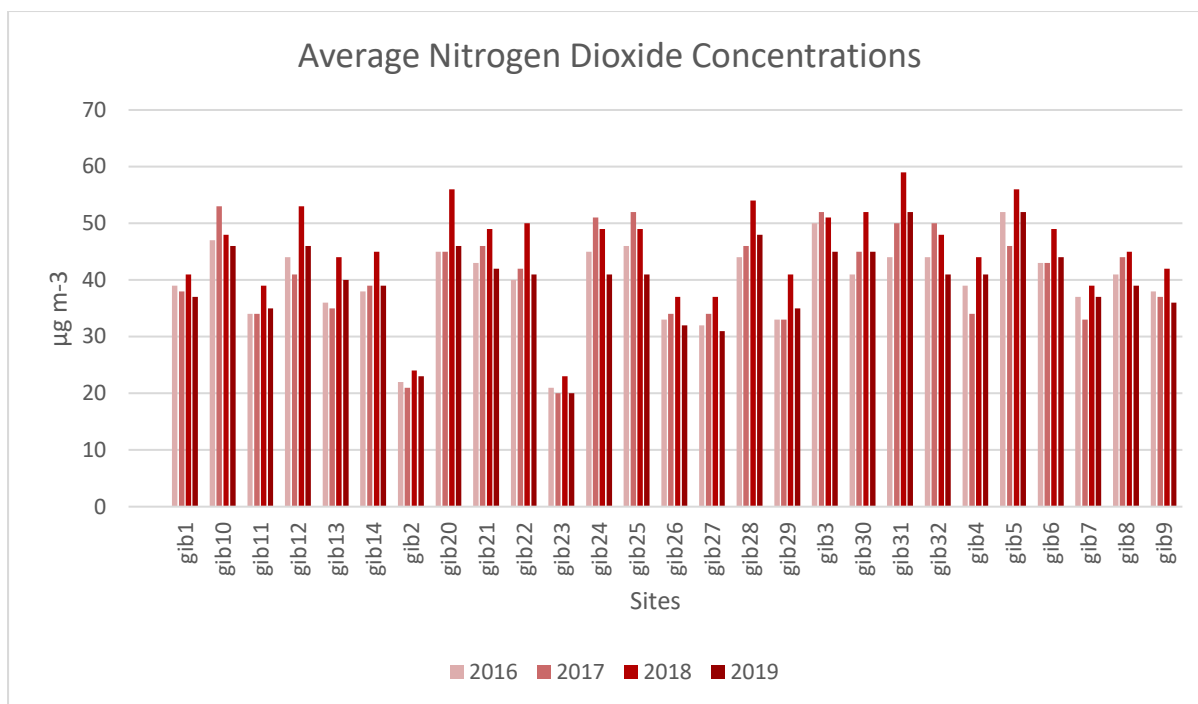
1.6.2 Nitrogen Dioxide Network

The following table shows diffusion tube readings of nitrogen dioxide at a variety of locations throughout Gibraltar. The target limit for this pollutant is 40 µg m⁻³.

Site ID	Site Name	2018 NO ₂ (µg m ⁻³)	2019 NO ₂ (µg m ⁻³)	Difference
gib1	Rosia Road	41	37	-4
gib10	South Barracks Road	48	46	-2
gib11	Main Street	39	35	-4
gib12	Water Gardens	53	46	-7
gib13	George Don House	44	40	-4
gib14	Prince Edwards Road	45	39	-6
gib2	Bleak House	24	23	-1
gib20	Sundial Roundabout	56	46	-10
gib21	Anchorage Rosia Road	49	42	-7
gib22	Rosia Promenade	50	41	-9
gib23	Lathbury Industrial Park	23	20	-3
gib24	Upper Withams Entrance	49	41	-8
gib25	Churchill House	49	41	-8
gib26	Alameda Gardens Theatre	37	32	-5
gib27	Alameda Gardens Access Road	37	31	-6
gib28	Rock Hotel	54	48	-6
gib29	Gardiners Road	41	35	-6
gib3	Jumpers	51	45	-6
gib30	Governors Meadow House	52	45	-7
gib31	Dockyard Road	59	52	-7
gib32	Woodford Cottage	48	41	-7
gib4	Devils Tower Road	44	41	-3
gib5	Glacis Road	56	52	-4
gib6	Queensway	49	44	-5
gib7	Harbour Views	39	37	-2
gib8	Red Sands Road	45	39	-6
gib9	Lime Kiln Road	42	36	-6

Average nitrogen dioxide concentrations in 2019.

In 2019, levels of nitrogen dioxide decreased substantially at all locations captured within the diffusion tube network. Although some locations failed to meet the 40 µg m⁻³ target value, this is a significant improvement to 2018 concentrations and puts Gibraltar back on track to reducing nitrogen dioxide levels locally.



Average nitrogen dioxide concentrations 2016-2019.

2. Natural Resources

2.1 Bathing Waters

The Bathing Water Directive (2006/7/EC), adopted in 15th February 2006, 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 carried out at Gibraltar’s six bathing areas - Camp Bay, Catalan Bay, Eastern Beach, Little Bay, Sandy Bay Western Beach – and more. The number of samples taken at respective sites in 2019 are as follows:

Site Name	Number of samples taken
Camp Bay	50
Little Bay	49
Catalan Bay	49
Sandy Bay	49
Sandy Bay Outer Groyne	48
Eastern Beach	50
Eastern Beach Frontier Fence	47
Western Beach	441
GASA pier	11
Rosia Bay Beach	12
Rosia Bay Pier	11

Number of samples taken as part of Environment (Quality of Bathing Water) Regulations 2009 monitoring.

Further to these legislative requirements, there is also a need to monitor for 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 consider the results

over the current bathing season and the preceding three years instead of a single year's result. In this way, classifications will be less susceptible to bad weather or one-off incidents, and provide results that are more reliable.

Camp Bay No. of occasions of low water quality

Year	E.Coli	Intestinal enterococci
	>500 cfu/100ml	>185 cfu/100ml
2016	0	0
2017	0	0
2018	0	0
2019	0	0

Incidences of Low Water Quality at Camp Bay.

Little Bay No. of occasions of low water quality

Year	E.Coli	Intestinal enterococci
	>500 cfu/100ml	>185 cfu/100ml
2016	0	1
2017	0	0
2018	0	1
2019	0	1

Incidences of Low Water Quality at Little Bay.

Catalan Bay No. of occasions of low water quality

Year	E.Coli	Intestinal enterococci
	>500 cfu/100ml	>185 cfu/100ml
2016	0	1
2017	1	1
2018	0	0
2019	0	1

Incidences of Low Water Quality at Catalan Bay.

Sandy Bay No. of occasions of low water quality

Year	E.Coli	Intestinal enterococci
	>500 cfu/100ml	>185 cfu/100ml
2016	1	1
2017	0	0
2018	0	0
2019	1	1

Incidences of Low Water Quality at Sandy Bay.

Eastern Beach No. of occasions of low water quality

Year	E.Coli	Intestinal enterococci
	>500 cfu/100ml	>185 cfu/100ml
2016	2	1
2017	0	0

2018	0	0
2019	0	0

Incidences of Low Water Quality at Eastern Beach.

Western Beach No. of occasions of low water quality

Year	E.Coli	Intestinal enterococci
	>500 cfu/100ml	>185 cfu/100ml
2016	112	96
2017	43	36
2018	97	88
2019	44	59

Incidences of Low Water Quality at Western Beach.

In 2019, the number of incidences of low water quality recorded at Western beach decreased significantly from 2018.

2.2 Potable Water Supply

In compliance with Gibraltar’s Public Health Act, all water produced by Aquagib, Gibraltar’s only utility supplier of potable water, must be analyzed to ensure its properties comply with the chemical and bacterial properties defined in this legislation. Carried out at the desalination plants and other locations throughout the distribution network, results for water quality recorded in 2019 are as follows;

Member State	United kingdom (Gibraltar)				
	Year	2019			
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	9	0	100
Boron	1	0	10	0	100
Bromate	1	1	10	1	90
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	9	1	100

Mercury	1	0	10	0	100
Nickel	1	0	10	0	100
Nitrite as NO ₃	1	0	10	0	100
Nitrate as NO ₂	1	0	10	0	100
Pesticides – total	1	0	10	0	100
Polycyclic Aromatic Hydrocarbons	1	0	9	0	100
Selenium	1	0	10	0	100
Tetrachloroethane and Trichloroethane	1	0	10	0	100
Trihalomethanes - Total	1	0	10	0	100

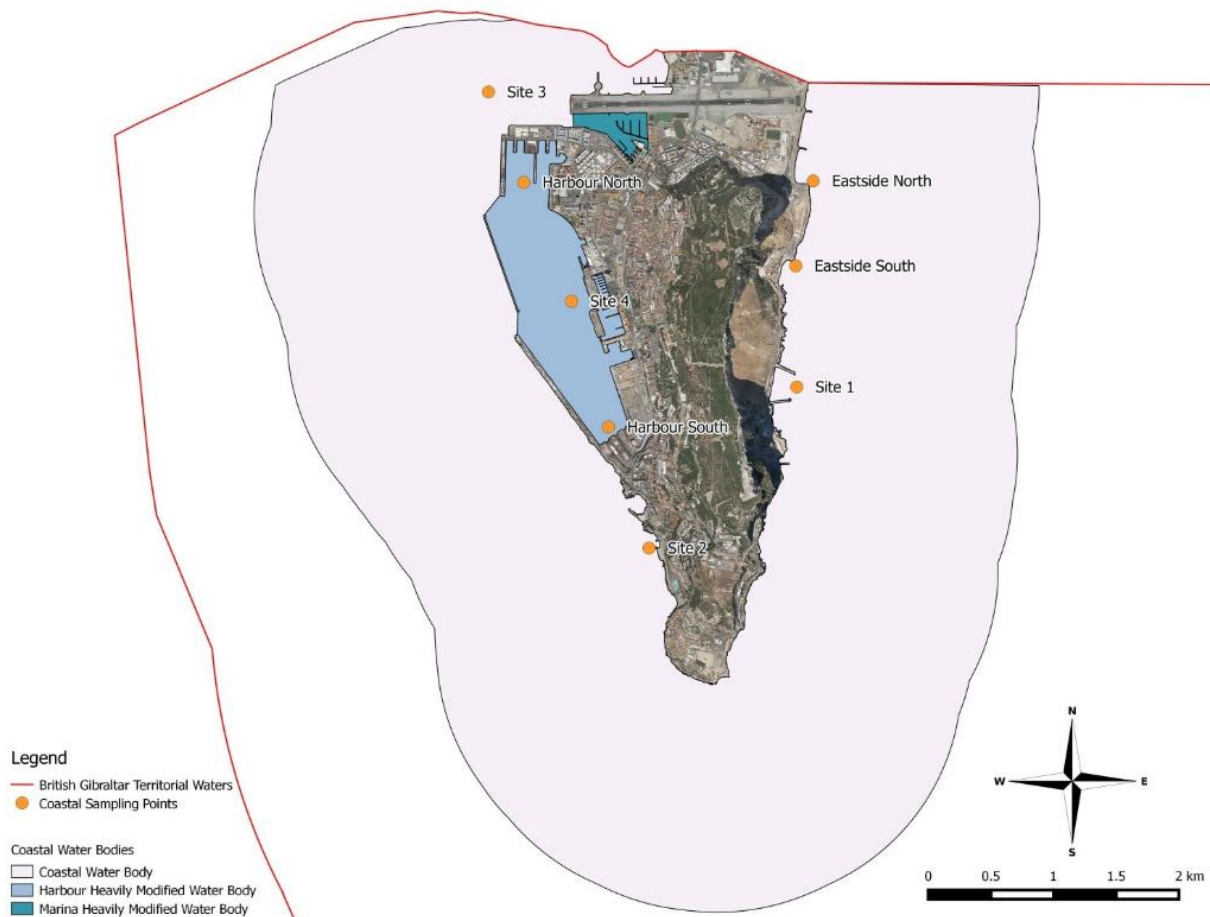
Indicator parameters

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	2	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.

2.3 Coastal Water Monitoring

The Department of the Environment and Climate Change carries out coastal water sampling on a regular basis at locations detailed on the map provided. In line with the Water Framework Directive (WFD) 2000/60/EC, a large variety of chemical and physio-chemical parameters are monitored at different locations and frequencies throughout the year.



Coastal water sampling points.

Chemical / physio-chemical parameters	Frequency
General	
Temperature	Monthly
Nutrient status - Total N, Total P, NO ₃ , NO ₂ , NH ₄ , PO ₄	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 (gamma-isomer, Lindane)	4 times per year
Simazine	4 times per year

Trifluralin		4 times per year
Metals		
Cadmium and its compounds		4 times per year
Lead and its compounds		4 times per year
Mercury and its compounds		4 times per year
Nickel and its compounds		4 times per year
Polyaromatic hydrocarbons		
Anthracene		4 times per year
Fluoranthene		4 times per year
Naphthalene		4 times per year
(Benzo(a)pyrene)		4 times per year
(Benzo(b)fluoranthene)		4 times per year
(Benzo(g,h,i)perylene)		4 times per year
(Benzo(k)fluoranthene)		4 times per year
(Indeno(1,2,3-cd)pyrene)		4 times per year
Chlorinated Hydrocarbons		
1,2-Dichloroethane		4 times per year
Dichloromethane		4 times per year
Hexachlorobenzene		4 times per year
Pentachlorobenzene		4 times per year
Trichlorobenzenes (1,2,4-Trichlorobenzene)		4 times per year
Trichloromethane (Chloroform)		4 times per year
TBT		
Tributyltin compounds (Tributyltin-cation)		4 times per year
Other hydrocarbons		
C10-13-chloroalkanes		4 times per year
Benzene		4 times per year
BDEs		
Brominated diphenylethers		4 times per year
DEHP		
Di(2-ethylhexyl)phthalate		4 times per year
Urons		
Diuron		4 times per year
Isoproturon		4 times per year
Phenols		
Nonylphenols (4-(para)-nonylphenol)		4 times per year
Octylphenols (para-tert-octylphenol)		4 times per year
Pentachlorophenol		4 times per year
Other pollutants		
Chromium		4 times per year
Copper		4 times per year
Zinc		4 times per year
Biological parameters		
Phytoplankton - Abundance & composition (Abn. & Comp.)		4 times per year
Benthic macroinvertebrates - Abundance, composition & biomass		Every 6 years

2.3.1 Coastal Monthly and Quarterly Data for 2019

		Site 1. Sandy Bay 09/01/2019	Site 2. Camp Bay 09/01/2019	Site 3. Runway 09/01/2019	Site 4. Mid Harbour 09/01/2019
Analyte	Units				
1,2,4-Trichlorobenzene	ug/l	<0.01	<0.01	<0.01	<0.01
1,2-Dichloroethane	ug/l	<0.1	<0.1	<0.1	<0.1
4-Nonylphenol Branched	ug/l	<0.4	<0.4	<0.4	<0.4
Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Atrazine	ug/l	<0.003	<0.003	<0.003	<0.003
Benzene	ug/l	<0.1	<0.1	<0.1	<0.1
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
Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Chlorfenvinphos	ug/l	<0.01	<0.01	<0.01	<0.01
Chloroform {Trichloromethane}	:- ug/l	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-ethyl	ug/l	<0.002	<0.002	<0.002	<0.002
Chlorpyrifos-methyl	ug/l	<0.001	<0.001	<0.001	<0.001
Chromium	ug/l	<0.5	<0.5	<0.5	<0.5
Chromium Hexavalent	ug/l	<0.3	<0.3	<0.3	<0.3
Copper	ug/l	0.32	0.29	0.366	0.255
Di-2-(ethylhexyl) phthalate	ug/l	<0.200	<0.200	<0.200	<0.200
Dichloromethane {Methylene Dichloride}	:- ug/l	<0.5	<0.5	<0.5	<0.5
Diuron	ug/l	<0.1	<0.1	<0.1	<0.1
Endosulfan A	ug/l	<0.004	<0.004	<0.004	<0.004
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
HCH -alpha	ug/l	<0.004	<0.004	<0.004	<0.004
HCH -beta	ug/l	<0.004	<0.004	<0.004	<0.004
HCH -delta	ug/l	<0.001	<0.001	<0.001	<0.001
HCH -epsilon	ug/l	<0.004	<0.004	<0.004	<0.004
HCH -gamma	ug/l	<0.004	<0.004	<0.004	<0.004
Hexachlorobenzene	ug/l	<0.001	<0.001	<0.001	<0.001
Hexachlorobutadiene	ug/l	<0.004	<0.004	<0.004	<0.004
Indeno(1,2,3-cd)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Isoproturon	ug/l	<0.1	<0.1	<0.1	<0.1
Lead	ug/l	0.0763	0.252	0.158	0.107
Mercury	ug/l	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/l	<0.01	<0.01	<0.01	<0.01
Nickel	ug/l	0.338	0.318	<0.3	<0.3
Pentachlorobenzene	ug/l	<0.001	<0.001	<0.001	<0.001

Pentachlorophenol	ug/l	<0.02	<0.02	<0.02	<0.02
p-tert-Octylphenol	ug/l	<0.1	<0.1	<0.1	<0.1
Simazine	ug/l	<0.003	<0.003	<0.003	<0.003
Tributyl Tin as Cation	ug/l	<0.0005	<0.0005	<0.0005	<0.0005
Trifluralin	ug/l	<0.002	<0.003	<0.003	<0.002
Zinc	ug/l	1.2	4.98	9.66	1.28

January 2019 Coastal Monitoring Results.

		Site 1. Sandy Bay 04/02/19	Site 2. Camp Bay 04/02/19	Site 3. Runway 04/02/19	Site 4. Mid Harbour 04/02/19
<i>Analyte</i>	<i>Units</i>				
Nitrogen as N	mg/l	0.114	0.107	0.11	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	<0.00400	<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	0.74	1.5	1.3
Solids, Suspended at 105 C	mg/l	<3.00	<3.00	<3.00	<3.00
Nitrate, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100

February 2019 Coastal Monitoring Results.

		Site 1. Sandy Bay 19/03/19	Site 2. Camp Bay 19/03/19	Site 3. Runway 19/03/19	Site 4. Mid Harbour 19/03/19
<i>Analyte</i>	<i>Units</i>				
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	3.4	1.6	2.1	3
Solids, Suspended at 105 C	mg/l	<3.00	<3.00	<3.00	<3.00
Nitrate, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100

March 2019 Coastal Monitoring Results.

		Site 1. Sandy Bay 03/04/2019	Site 2. Camp Bay 03/04/2019	Site 3. Runway 03/04/2019	Site 4. Mid Harbour 03/04/2019
Analyte	Units				
1,2,4-Trichlorobenzene	ug/l	<0.01	<0.01	<0.01	<0.01
1,2-Dichloroethane	ug/l	<0.1	<0.1	<0.1	<0.1
4-Nonylphenol Branched	ug/l	<0.4	<0.4	<0.4	<0.4
Anthracene	ug/l	<0.01	<0.01	<0.01	<0.01
Atrazine	ug/l	<0.003	<0.003	<0.003	<0.003
Benzene	ug/l	<0.1	<0.1	<0.1	<0.1
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
Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Chlorfenvinphos	ug/l	<0.01	<0.01	<0.01	<0.01
Chloroform {Trichloromethane}	:- ug/l	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-ethyl	ug/l	<0.002	<0.002	<0.002	<0.002
Chlorpyrifos-methyl	ug/l	<0.001	<0.001	<0.001	<0.001
Chromium	ug/l	<0.5	<0.5	<0.5	0.507
Chromium Hexavalent	ug/l	<0.3	<0.3	<0.3	<0.3
Copper	ug/l	<0.2	<0.2	0.346	0.716
Di-2-(ethylhexyl) phthalate	ug/l	<0.200	<0.200	<0.200	<0.200
Dichloromethane {Methylene Dichloride}	:- ug/l	<0.5	<0.5	<0.5	<0.5
Diuron	ug/l	<0.1	<0.1	<0.1	<0.1
Endosulfan A	ug/l	<0.003	<0.003	<0.003	<0.003
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.01
HCH -alpha	ug/l	<0.003	<0.003	<0.003	<0.003
HCH -beta	ug/l	<0.003	<0.003	<0.003	<0.003
HCH -delta	ug/l	<0.001	<0.001	<0.001	<0.001
HCH -epsilon	ug/l	<0.003	<0.003	<0.003	<0.003
HCH -gamma	ug/l	<0.003	<0.003	<0.003	<0.003
Hexachlorobenzene	ug/l	<0.001	<0.001	<0.001	<0.001
Hexachlorobutadiene	ug/l	<0.003	<0.003	<0.003	<0.003
Indeno(1,2,3-cd)pyrene	ug/l	<0.01	<0.01	<0.01	<0.01
Isoproturon	ug/l	<0.1	<0.1	<0.1	<0.1
Lead	ug/l	0.207	0.0773	0.116	0.568
Mercury	ug/l	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/l	<0.01	<0.01	<0.01	<0.01
Nickel	ug/l	0.42	0.363	<0.3	<0.3
Pentachlorobenzene	ug/l	<0.001	<0.001	<0.001	<0.001
Pentachlorophenol	ug/l	<0.02	<0.02	<0.02	<0.02
p-tert-Octylphenol	ug/l	<0.1	<0.1	<0.1	<0.1

Simazine	ug/l	<0.003	<0.003	<0.003	<0.003
Tributyl Tin as Cation	ug/l	<0.0005	<0.0005	<0.0005	0.00173
Trifluralin	ug/l	<0.002	<0.002	<0.002	<0.002
Zinc	ug/l	3.24	1.26	1.37	1.56

April 2019 Coastal Monitoring Results.

		Site 1. Sandy Bay 22/05/19	Site 2. Camp Bay 22/05/19	Site 3. Runway 22/05/19	Site 4. Mid Harbour 22/05/19
Analyte	Units				
Nitrogen as N	mg/l	0.101	<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	<0.00400	<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	10.2	4.7	5.3	5.1
Solids, Suspended at 105 C	mg/l	<3.00	<3.00	<3.00	<3.00
Nitrate, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100

May 2019 Coastal Monitoring Results.

		Site 1. Sandy Bay 18/06/19	Site 2. Camp Bay 18/06/19	Site 3. Runway 18/06/19	Site 4. Mid Harbour 18/06/19
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	<0.00400	<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	5.3	3.9	2.7	3.2
Solids, Suspended at 105 C	mg/l	12.9	5.7	<3.00	4.8
Nitrate, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100

June 2019 Coastal Monitoring Results.

		Site 1. Sandy Bay 10/07/2019	Site 2. Camp Bay 10/07/2019	Site 3. Runway 10/07/2019	Site 4. Mid Harbour 10/07/2019
Analyte	Units				
Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Lead	ug/l	0.082	0.12	0.31	0.25
Nickel	ug/l	0.32	<0.3	0.37	0.47
DDT : Sum of components	ug/l	<0.0060	<0.0070	<0.0050	<0.030
HCH : Total Isomers (Alpha, Beta, Gamma, Delta, Epsilon)	ug/l	<0.017	<0.017	<0.013	<0.085
4-Nonylphenol Branched	ug/l	<0.4	<0.4	<0.4	<0.4
4-Nonylphenol Diethoxylate (Isomeric mix)	ug/l	<0.2	<0.2	<0.2	<0.2
4-Nonylphenol Monoethoxylate (Isomeric mix)	ug/l	<0.2	<0.2	<0.2	<0.2
4-Nonylphenol Triethoxylate (Isomeric mix)	ug/l	<0.4	<0.4	<0.4	<0.4
Nonylphenol ethoxylates (1-4 EO)	ug/l	<0.6	<0.6	<0.6	<0.6
Octylphenol ethoxylates (1-2 EO)	ug/l	<0.2	<0.2	<0.2	<0.2
p-tert-Octylphenol	ug/l	<0.1	<0.1	<0.1	<0.1
pTert-Octylphenol Diethoxylate	ug/l	<0.1	<0.1	<0.1	<0.1
pTert-Octylphenol Monoethoxylate	ug/l	<0.1	<0.1	<0.1	<0.1
Di-2-ethylhexyl phthalate :- {DEHP}	ug/l	<0.2	<0.2	<0.2	<0.2
Aldrin	ug/l	<0.001	<0.001	<0.001	<0.005
DDT -op	ug/l	<0.004	<0.004	<0.003	<0.02
DDT -pp	ug/l	<0.002	<0.003	<0.002	<0.01
Dieldrin	ug/l	<0.002	<0.003	<0.002	<0.01
Endosulfan A	ug/l	<0.004	<0.004	<0.003	<0.02
Endosulfan B	ug/l	<0.005	<0.005	<0.004	<0.02
Endrin	ug/l	<0.004	<0.004	<0.003	<0.02
HCH -alpha	ug/l	<0.004	<0.004	<0.003	<0.02
HCH -beta	ug/l	<0.004	<0.004	<0.003	<0.02
HCH -delta	ug/l	<0.001	<0.001	<0.001	<0.005
HCH -epsilon	ug/l	<0.004	<0.004	<0.003	<0.02
HCH -gamma :- {Lindane}	ug/l	<0.004	<0.004	<0.003	<0.02
Isodrin	ug/l	<0.001	<0.001	<0.001	<0.005
Pentachlorobenzene	ug/l	<0.001	<0.001	<0.001	<0.005
Trifluralin	ug/l	<0.01	<0.003	<0.002	<0.01
Atrazine	ug/l	<0.003	<0.003	<0.003	-

Chlorpyrifos-ethyl	ug/l	<0.002	<0.002	<0.002	-
Chlorpyrifos-methyl	ug/l	<0.001	<0.001	<0.001	-
Dichlorvos	ug/l	<0.004	<0.004	<0.004	-
Simazine	ug/l	<0.003	<0.003	<0.003	-
Terbutryn	ug/l	<0.004	<0.004	<0.004	-
Tributyl Tin as Cation	ug/l	<0.0005	<0.0005	<0.0005	0.0016
Anthracene	ug/l	<0.01	<0.01	-	<0.01
Aclonifen	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Alachlor	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Bifenox	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Chlorfenvinphos	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Quinoxifen	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	ug/l	<0.02	<0.02	<0.02	<0.02
Cypermethrin	ug/l	<0.002	<0.002	<0.002	<0.002
Cypermethrin Identification	Text	Not detected.	Not detected.	Not detected	Not detected
Diuron	ug/l	<0.1	<0.1	<0.1	<0.1
Isoproturon	ug/l	<0.1	<0.1	<0.1	<0.1
1,2,3-Trichlorobenzene	ug/l	<0.1	<0.1	<0.1	<0.1
1,2,4-Trichlorobenzene	ug/l	<0.1	<0.1	<0.1	<0.1
1,2-Dichloroethane	ug/l	<0.1	<0.1	<0.1	<0.1
1,3,5-Trichlorobenzene	ug/l	<0.1	<0.1	<0.1	<0.1
Benzene	ug/l	<0.1	<0.1	<0.1	<0.1
Carbon tetrachloride :- {Tetrachloromethane}	ug/l	<0.1	<0.1	<0.1	<0.1
Chloroform :- {Trichloromethane}	ug/l	<0.1	<0.1	<0.1	<0.1
Dichloromethane :- {Methylene Dichloride}	ug/l	<0.5	<0.5	<0.5	<0.5
Naphthalene	ug/l	<0.1	<0.1	<0.1	<0.1
Tetrachloroethylene :- {Perchloroethylene}	ug/l	<0.1	<0.1	<0.1	<0.1
Trichloroethylene :- {Trichloroethene}	ug/l	<0.1	<0.1	<0.1	<0.1

July 2019 Coastal Monitoring Results.

		Site 1. Sandy Bay 20/08/19	Site 2. Camp Bay 20/08/19	Site 3. Runway 20/08/19	Site 4. Mid Harbour 20/08/19
Analyte	Units				
Nitrogen as N	mg/l	0.119	0.103	0.105	<0.100
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	1.9	1.3	0.69	1.2
Solids, Suspended at 105 C	mg/l	<3.00	3.2	5.4	<3.00
Nitrate, Filtered as N	mg/l	<0.100	<0.100	<0.100	<0.100

August 2019 Coastal Monitoring Results.

		Site 1. Sandy Bay 26/11/19	Site 2. Camp Bay 26/11/19	Site 3. Runway 26/11/19	Site 4. Mid Harbour 26/11/19
Analyte	Units				
Cadmium	ug/l	<0.03	<0.03	<0.03	<0.03
Lead	ug/l	0.15	0.074	0.15	0.28
Nickel	ug/l	0.43	<0.3	0.36	<0.3
DDT : Sum of components	ug/l	<0.0050	<0.0050	<0.0050	<0.0050
HCH : Total Isomers (Alpha, Beta, Gamma, Delta, Epsilon)	ug/l	<0.013	<0.013	<0.013	<0.013
4-Nonylphenol Branched	ug/l	<0.4	<0.4	<0.4	<0.4
4-Nonylphenol Diethoxylate (Isomeric mix)	ug/l	<0.2	<0.2	<0.2	<0.2
4-Nonylphenol Monoethoxylate (Isomeric mix)	ug/l	<0.2	<0.2	<0.2	<0.2
4-Nonylphenol Triethoxylate (Isomeric mix)	ug/l	<0.4	<0.4	<0.4	<0.4
Nonylphenol ethoxylates (1-4 EO)	ug/l	<0.6	<0.6	<0.6	<0.6
Octylphenol ethoxylates (1-2 EO)	ug/l	<0.2	<0.2	<0.2	<0.2
p-tert-Octylphenol	ug/l	<0.1	<0.1	<0.1	<0.1
pTert-Octylphenol Diethoxylate	ug/l	<0.1	<0.1	<0.1	<0.1
pTert-Octylphenol Monoethoxylate	ug/l	<0.1	<0.1	<0.1	<0.1
Di-2-ethylhexyl phthalate :- {DEHP}	ug/l	<0.2	<0.2	<0.2	<0.2
Aldrin	ug/l	<0.001	<0.001	<0.001	<0.001
DDT -op	ug/l	<0.003	<0.003	<0.003	<0.003
DDT -pp	ug/l	<0.002	<0.002	<0.002	<0.002
Dieldrin	ug/l	<0.002	<0.002	<0.002	<0.002
Endosulfan A	ug/l	<0.003	<0.003	<0.003	<0.003
Endosulfan B	ug/l	<0.004	<0.004	<0.004	<0.004
Endrin	ug/l	<0.003	<0.003	<0.003	<0.003
HCH -alpha	ug/l	<0.003	<0.003	<0.003	<0.003

HCH -beta	ug/l	<0.003	<0.003	<0.003	<0.003
HCH -delta	ug/l	<0.001	<0.001	<0.001	<0.001
HCH -epsilon	ug/l	<0.003	<0.003	<0.003	<0.003
HCH -gamma :- {Lindane}	ug/l	<0.003	<0.003	<0.003	<0.003
Isodrin	ug/l	<0.001	<0.001	<0.001	<0.001
Pentachlorobenzene	ug/l	<0.001	<0.001	<0.001	<0.001
Trifluralin	ug/l	<0.002	<0.002	<0.002	<0.002
Atrazine	ug/l	<0.003	<0.003	<0.003	<0.003
Chlorpyrifos-ethyl	ug/l	<0.002	<0.002	<0.002	<0.002
Chlorpyrifos-methyl	ug/l	<0.001	<0.001	<0.001	<0.001
Dichlorvos	ug/l	<0.004	<0.004	<0.004	<0.004
Simazine	ug/l	<0.003	<0.003	<0.003	<0.003
Terbutryn	ug/l	<0.004	<0.004	<0.004	<0.004
Tributyl Tin as Cation	ug/l	<0.0005	<0.0005	<0.0005	<0.0005
Anthracene	ug/l	-	-	-	-
Aclonifen	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Alachlor	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Bifenox	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Chlorfenvinphos	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Quinoxifen	ug/l	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	ug/l	<0.02	<0.02	<0.02	<0.02
Cypermethrin	ug/l	<0.002	<0.002	<0.002	<0.002
Cypermethrin Identification	Text	Not Detected	Not detected.	Not detected	Not detected
Diuron	ug/l	<0.1	<0.1	<0.1	<0.1
Isoproturon	ug/l	<0.1	<0.1	<0.1	<0.1
1,2,3-Trichlorobenzene	ug/l	<0.1	<0.1	<0.1	<0.1
1,2,4-Trichlorobenzene	ug/l	<0.1	<0.1	<0.1	<0.1
1,2-Dichloroethane	ug/l	<0.1	<0.1	<0.1	<0.1
1,3,5-Trichlorobenzene	ug/l	<0.1	<0.1	<0.1	<0.1
Benzene	ug/l	<0.1	<0.1	<0.1	<0.1
Carbon tetrachloride :- {Tetrachloromethane}	ug/l	<0.1	<0.1	<0.1	<0.1
Chloroform :- {Trichloromethane}	ug/l	<0.1	<0.1	<0.1	<0.1
Dichloromethane :- {Methylene Dichloride}	ug/l	<0.5	<0.5	<0.5	<0.5
Naphthalene	ug/l	<0.1	<0.1	<0.1	<0.1
Tetrachloroethylene :- {Perchloroethylene}	ug/l	<0.1	<0.1	<0.1	<0.1
Trichloroethylene :- {Trichloroethene}	ug/l	<0.1	<0.1	<0.1	<0.1

November 2019 Coastal Monitoring Results.

2.4 Groundwater Monitoring

As part of the Department's groundwater monitoring schedule, samples are taken on a quarterly basis from two local aquifers: one located in the Northern Isthmus and one in the Southern bedrock. The results from samples taken in 2019 are as follows:

		Site 1. Silent Pool 05/03/19	Site 2. Cemetery 05/03/19	Site 3. Frontier 05/03/19	Site 4. Four Corners 05/03/19	Site 5. Runway 05/03/19
Analyte	Units					
Alkalinity to pH 4.5 as CaCO ₃	mg/l	177	182	211	322	234
Ammoniacal Nitrogen as N	mg/l	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Chloride	mg/l	1420	31.2	63.9	162	37.8
Nitrite as N	mg/l	<0.00400	<0.00400	<0.00400	<0.00400	<0.00400
Nitrogen : Total Oxidised as N	mg/l	6.13	11	4.89	1.08	0.85
Carbon, Organic : Total as C :- {TOC}	mg/l	1.3	1.4	0.9	1	2.1
Solids, Suspended at 105 C	mg/l	-	<3	<3	13.5	<3
Arsenic	mg/l	<1	3.05	1.63	5.88	8.8
Cadmium	mg/l	<0.1	<0.1	0.293	<0.1	<0.1
Lead	mg/l	<2	<2	<2	20.4	<2
Zinc	mg/l	<5	38.8	137	80.4	18.7
Calcium	mg/l	-	83.1	66	98.4	67.5
Magnesium	mg/l	119	8.02	24.7	29.6	19.2
Potassium	mg/l	102	6.22	4.1	12.4	4.77
Sodium	mg/l	29.8	23.5	44	109	35.5
Sulphate as SO ₄	mg/l	774	31.9	42.1	49.8	44.4
Mercury	mg/l	-	0.01	<0.01	<0.01	<0.01
Bicarbonate as HCO ₃	mg/l	-	222	257	393	285
Nitrate as N	mg/l	-	<11.0	<4.89	<1.08	<0.850
Hydrocarbons Screen >C5 - C44	mg/l	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/l	-	<0.01	<0.01	<0.01	-
1,2,4-Trichlorobenzene	mg/l	<0.01	<0.01	<0.01	<0.01	-
1,3,5-Trichlorobenzene	mg/l	<0.01	<0.01	<0.01	<0.01	-
2,3,5,6-Tetrachloroaniline	mg/l	<0.01	<0.001	<0.002	<0.001	-
2,3,5,6-Tetrachlorothioanisole	mg/l	<0.001	<0.001	<0.002	<0.001	-
Aldrin	mg/l	<0.001	<0.001	<0.002	<0.001	-

Chlorothalonil	mg/l	<0.001	<0.001	<0.002	<0.001	-
Chlorpropham	mg/l	<0.001	<0.006	<0.006	<0.006	-
DDE -op	mg/l	<0.006	<0.001	<0.002	<0.001	-
DDE -pp	mg/l	<0.001	<0.001	<0.002	0.0213	-
DDT -op	mg/l	<0.001	<0.004	<0.004	<0.004	-
DDT -pp	mg/l	<0.004	<0.002	<0.002	0.0111	-
Dichlobenil :- {2,6-Dichlorobenzonitrile }	mg/l	<0.002	<0.001	<0.002	<0.001	-
Dieldrin	mg/l	<0.001	<0.002	<0.002	<0.002	-
Endosulfan A	mg/l	<0.002	<0.004	<0.004	<0.004	-
Endosulfan B	mg/l	<0.004	<0.005	<0.005	<0.005	-
Endrin	mg/l	<0.005	<0.004	<0.004	<0.004	-
HCH -alpha	mg/l	<0.004	<0.004	<0.004	<0.004	-
HCH -beta	mg/l	<0.004	<0.004	<0.004	<0.004	-
HCH -delta	mg/l	<0.004	<0.001	<0.002	<0.001	-
HCH -epsilon	mg/l	<0.001	<0.004	<0.004	<0.004	-
HCH -gamma :- {Lindane}	mg/l	<0.004	<0.004	<0.004	<0.004	-
Heptachlor	mg/l	<0.004	<0.001	<0.002	<0.001	-
Hexachlorobenzene	mg/l	<0.001	<0.001	<0.002	<0.001	-
Hexachlorobutadiene	mg/l	<0.001	<0.004	<0.004	<0.004	-
Isodrin	mg/l	<0.004	<0.001	<0.002	<0.001	-
Methoxychlor	mg/l	<0.001	<0.001	<0.002	<0.001	-
Pendimethalin	mg/l	<0.002	<0.01	<0.01	<0.01	-
Pentachlorobenzene	mg/l	<0.01	<0.001	<0.002	<0.001	-
Propachlor	mg/l	<0.001	<0.001	<0.002	<0.001	-
TDE - op	mg/l	<0.001	<0.001	<0.002	0.00136	-
TDE - pp	mg/l	<0.001	<0.002	<0.002	0.00618	-
Tecnazene	mg/l	<0.002	<0.001	<0.002	<0.001	-
Tri-allate	mg/l	<0.001	<0.007	<0.007	<0.007	-
Trifluralin	mg/l	<0.007	<0.002	<0.002	<0.002	-
Vinclozolin	mg/l	<0.002	<0.002	<0.002	<0.002	-
cis-Chlordane	mg/l	<0.002	<0.001	<0.002	<0.001	-
cis-Heptachlor epoxide	mg/l	<0.001	<0.004	<0.004	<0.004	-
trans-Chlordane	mg/l	<0.004	<0.001	<0.002	<0.001	-
trans-Heptachlor epoxide	mg/l	<0.001	<0.004	<0.004	<0.004	-
Atrazine	mg/l	<0.004	<0.003	<0.003	<0.003	<0.003
Atrazine-desethyl	mg/l	<0.003	<0.02	<0.02	<0.02	<0.02
Atrazine-desisopropyl	mg/l	<0.02	<0.02	<0.02	<0.02	<0.02
Azinphos-ethyl	mg/l	<0.02	<0.006	<0.006	<0.006	<0.006
Azinphos-methyl	mg/l	<0.006	<0.003	<0.003	<0.003	<0.003
Bendiocarb	mg/l	<0.003	<0.005	<0.005	<0.005	<0.005
Bupirimate	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005

Carbophenothion	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005
Chlorfenvinphos	mg/l	<0.005	<0.01	<0.01	<0.01	<0.01
Chlorpyrifos-ethyl	mg/l	<0.01	<0.002	<0.002	<0.002	<0.002
Chlorpyrifos-methyl	mg/l	<0.002	<0.001	<0.001	<0.001	<0.001
Coumaphos	mg/l	<0.001	<0.005	<0.005	<0.005	<0.005
Cyanazine	mg/l	<0.005	<0.006	<0.006	<0.006	<0.006
Desmetryn	mg/l	<0.006	<0.005	<0.005	<0.005	<0.005
Diazinon	mg/l	<0.005	<0.001	<0.001	<0.001	<0.001
Dichlorvos	mg/l	<0.001	<0.004	<0.004	<0.004	<0.004
Dimethoate	mg/l	<0.004	<0.006	<0.006	<0.006	<0.006
Ethion	mg/l	<0.006	<0.005	<0.005	<0.005	<0.005
Ethofumesate	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005
Fenclorphos	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005
Fenitrothion	mg/l	<0.005	<0.001	<0.001	<0.001	<0.001
Fenpropimorph	mg/l	<0.001	<0.007	<0.007	<0.007	<0.007
Fenthion	mg/l	<0.007	<0.008	<0.008	<0.008	<0.008
Fonofos	mg/l	<0.008	<0.001	<0.001	<0.001	<0.001
Iodofenphos	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Iprodione	mg/l	<0.001	<0.008	<0.008	<0.008	<0.008
Irgarol 1051	mg/l	<0.008	<0.005	<0.005	<0.005	<0.005
Malathion	mg/l	<0.005	<0.002	<0.002	<0.002	<0.002
Metalaxyl	mg/l	<0.002	<0.008	<0.008	<0.008	<0.008
Metazachlor	mg/l	<0.008	<0.005	<0.005	<0.005	<0.005
Mevinphos	mg/l	<0.005	<0.008	<0.008	<0.008	<0.008
Napropamide	mg/l	<0.008	<0.005	<0.005	<0.005	<0.005
Parathion-ethyl	mg/l	<0.005	<0.004	<0.004	<0.004	<0.004
Parathion-methyl	mg/l	<0.004	<0.005	<0.005	<0.005	<0.005
Phorate	mg/l	<0.005	<0.02	<0.02	<0.02	<0.02
Pirimicarb	mg/l	<0.02	<0.004	<0.004	<0.004	<0.004
Pirimiphos-ethyl	mg/l	<0.004	<0.005	<0.005	<0.005	<0.005
Pirimiphos-methyl	mg/l	<0.005	<0.003	<0.003	<0.003	<0.003
Prochloraz	mg/l	<0.003	<0.007	<0.007	<0.007	<0.007
Prometryn	mg/l	<0.007	<0.005	<0.005	<0.005	<0.005
Propazine	mg/l	<0.005	<0.002	<0.002	<0.002	<0.002
Propetamphos	mg/l	<0.002	<0.005	<0.005	<0.005	<0.005
Propyzamide	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005
Simazine	mg/l	<0.005	<0.003	<0.003	<0.003	<0.003
Terbutryn	mg/l	<0.003	<0.004	<0.004	<0.004	<0.004
Triazophos	mg/l	<0.004	<0.005	<0.005	<0.005	<0.005
Trietazine	mg/l	<0.005	<0.002	<0.002	<0.002	<0.002
Bifenthrin	mg/l	<0.002	<0.001	<0.001	<0.001	<0.001
Cyfluthrin	mg/l	<0.001	<0.003	<0.003	<0.003	<0.003
Cypermethrin	mg/l	<0.003	<0.002	<0.002	<0.002	<0.002

Cypermethrin Identification	mg/l	Not detected.	Not detected.	Not detected.	Not detected.	Not detected.
Deltamethrin	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002
Flumethrin	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003
Lambda-cyhalothrin	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002
cis-Permethrin	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002
trans-Permethrin	mg/l	<0.001	-	-	-	<0.001
1,2-Dichloroethane	mg/l	-	<0.1	<0.1	<0.1	<0.1
Benzene	mg/l	-	<0.1	<0.1	<0.1	<0.1
Bromodichloromethane	mg/l	-	<0.1	<0.1	<0.1	<0.1
Bromoform :- {Tribromomethane}	mg/l	-	<0.1	<0.1	<0.1	<0.1
Chloroform :- {Trichloromethane}	mg/l	-	<0.1	<0.1	<0.1	<0.1

March 2019 Groundwater Monitoring Results.

		Site 1. Silent Pool 25/06/19	Site 2. Cemetery 25/06/19	Site 3. Frontier 25/06/19	Site 4. Four Corners 25/06/19	Site 5. Runway 25/06/19
Analyte	Units					
Alkalinity to pH 4.5 as CaCO ₃	mg/l	163	191	Unable to access site	239	347
Ammoniacal Nitrogen as N	mg/l	<0.0300	0.153		<0.0300	<0.0300
Chloride	mg/l	1450	31.8		37	201
Nitrite as N	mg/l	<0.00400	0.0103		<0.00400	0.0046
Nitrogen : Total Oxidised as N	mg/l	6.29	8.18		0.31	1.19
Carbon, Organic : Total as C :- {TOC}	mg/l	1	1.4		1.9	1.2
Solids, Suspended at 105 C	mg/l	-	<3		<3	5.13
Arsenic	mg/l	<1	3.62		13.3	5.98
Cadmium	mg/l	<0.1	<0.1		<0.1	<0.1
Lead	mg/l	<2	<2		<2	3.05
Zinc	mg/l	5.4	90		13.4	43
Calcium	mg/l	120	77.7		67.9	102
Magnesium	mg/l	93.6	7.27		19.6	33.1
Potassium	mg/l	26.6	6.86		5.24	14
Sodium	mg/l	811	24.1		35.9	124
Sulphate as SO ₄	mg/l	227	26.9		40.7	44.4
Mercury	mg/l	-	<0.01		<0.01	<0.01
Bicarbonate as HCO ₃	mg/l	-	233		292	423

Nitrate as N	mg/l	-	8.17	<0.310	1.19
Hydrocarbons Screen >C5 - C44	mg/l	-	-	-	-
1,2,3-Trichlorobenzene	mg/l	<0.01	<0.01	<0.01	<0.01
1,2,4-Trichlorobenzene	mg/l	<0.01	<0.01	<0.01	<0.01
1,3,5-Trichlorobenzene	mg/l	<0.01	<0.01	<0.01	<0.01
2,3,5,6- Tetrachloroaniline	mg/l	<0.001	<0.001	<0.001	<0.001
2,3,5,6- Tetrachlorothioanisole	mg/l	<0.001	<0.001	<0.001	<0.001
Aldrin	mg/l	<0.001	<0.001	<0.001	<0.001
Chlorothalonil	mg/l	<0.001	<0.001	<0.001	<0.001
Chlorpropham	mg/l	<0.005	<0.005	<0.005	<0.005
DDE -op	mg/l	<0.001	<0.001	<0.001	<0.001
DDE -pp	mg/l	0.00161	<0.001	0.0068	0.0256
DDT -op	mg/l	<0.003	<0.003	<0.003	<0.003
DDT -pp	mg/l	<0.002	<0.002	0.0204	0.0124
Dichlobenil :- {2,6- Dichlorobenzonitrile }	mg/l	<0.001	<0.001	<0.001	<0.001
Dieldrin	mg/l	<0.002	<0.002	<0.002	<0.002
Endosulfan A	mg/l	<0.003	<0.003	<0.003	<0.003
Endosulfan B	mg/l	<0.004	<0.004	<0.004	<0.004
Endrin	mg/l	<0.003	<0.003	<0.003	<0.003
HCH -alpha	mg/l	<0.003	<0.003	<0.003	<0.003
HCH -beta	mg/l	<0.003	<0.003	<0.003	<0.003
HCH -delta	mg/l	<0.001	<0.001	<0.001	<0.001
HCH -epsilon	mg/l	<0.003	<0.003	<0.003	<0.003
HCH -gamma :- {Lindane}	mg/l	<0.003	<0.003	<0.003	<0.003
Heptachlor	mg/l	<0.001	<0.001	<0.001	<0.001
Hexachlorobenzene	mg/l	<0.001	<0.001	<0.001	<0.001
Hexachlorobutadiene	mg/l	<0.003	<0.003	<0.003	<0.003
Isodrin	mg/l	<0.001	<0.001	<0.001	<0.001
Methoxychlor	mg/l	<0.001	<0.001	<0.001	<0.001
Pendimethalin	mg/l	<0.01	<0.01	<0.01	<0.01
Pentachlorobenzene	mg/l	<0.001	<0.001	<0.001	<0.001
Propachlor	mg/l	<0.001	<0.001	<0.001	0.00112
TDE - op	mg/l	<0.001	<0.001	<0.001	0.00135
TDE - pp	mg/l	<0.002	<0.002	0.00474	0.00643
Tecnazene	mg/l	<0.001	<0.001	<0.001	<0.001
Tri-allate	mg/l	<0.006	<0.006	<0.006	<0.006
Trifluralin	mg/l	<0.002	<0.002	<0.002	<0.002
Vinclozolin	mg/l	<0.002	<0.002	<0.002	<0.002

cis-Chlordane	mg/l	<0.001	<0.001	<0.001	<0.001
cis-Heptachlor epoxide	mg/l	<0.003	<0.003	<0.003	<0.003
trans-Chlordane	mg/l	<0.001	<0.001	<0.001	<0.001
trans-Heptachlor epoxide	mg/l	<0.003	<0.003	<0.003	<0.003
Atrazine	mg/l	<0.003	<0.003	<0.003	<0.003
Atrazine-desethyl	mg/l	<0.02	<0.02	<0.02	<0.02
Atrazine-desisopropyl	mg/l	<0.02	<0.02	<0.02	<0.02
Azinphos-ethyl	mg/l	<0.006	<0.006	<0.006	<0.006
Azinphos-methyl	mg/l	<0.003	<0.003	<0.003	<0.003
Bendiocarb	mg/l	<0.005	<0.005	<0.005	<0.005
Bupirimate	mg/l	<0.005	<0.005	<0.005	<0.005
Carbophenothion	mg/l	<0.005	<0.005	<0.005	<0.005
Chlorfenvinphos	mg/l	<0.01	<0.01	<0.01	<0.01
Chlorpyrifos-ethyl	mg/l	<0.002	<0.002	<0.002	<0.002
Chlorpyrifos-methyl	mg/l	<0.001	<0.001	<0.001	<0.001
Coumaphos	mg/l	<0.005	<0.005	<0.005	<0.005
Cyanazine	mg/l	<0.006	<0.006	<0.006	<0.006
Desmetryn	mg/l	<0.005	<0.005	<0.005	<0.005
Diazinon	mg/l	<0.001	<0.001	<0.001	<0.001
Dichlorvos	mg/l	<0.004	<0.004	<0.004	<0.004
Dimethoate	mg/l	<0.006	<0.006	<0.006	<0.006
Ethion	mg/l	<0.005	<0.005	<0.005	<0.005
Ethofumesate	mg/l	<0.005	<0.005	<0.005	<0.005
Fenchlorphos	mg/l	<0.005	<0.005	<0.005	<0.005
Fenitrothion	mg/l	<0.001	<0.001	<0.001	<0.001
Fenpropimorph	mg/l	<0.007	<0.007	<0.007	<0.007
Fenthion	mg/l	-	-	<0.008	<0.008
Fonofos	mg/l	<0.001	<0.001	<0.001	<0.001
Iodofenphos	mg/l	<0.001	<0.001	<0.001	<0.001
Iprodione	mg/l	<0.008	<0.008	<0.008	<0.008
Irgarol 1051	mg/l	<0.005	<0.005	<0.005	<0.005
Malathion	mg/l	<0.002	<0.002	<0.002	<0.002
Metalaxyl	mg/l	<0.008	<0.008	<0.008	<0.008
Metazachlor	mg/l	<0.005	<0.005	<0.005	<0.005
Mevinphos	mg/l	<0.008	<0.008	<0.008	<0.008
Napropamide	mg/l	<0.005	<0.005	<0.005	<0.005
Parathion-ethyl	mg/l	<0.004	<0.004	<0.004	<0.004
Parathion-methyl	mg/l	<0.005	<0.005	<0.005	<0.005
Phorate	mg/l	<0.02	<0.02	<0.02	<0.02
Pirimicarb	mg/l	-	-	<0.004	<0.004
Pirimiphos-ethyl	mg/l	<0.005	<0.005	<0.005	<0.005
Pirimiphos-methyl	mg/l	<0.003	<0.003	<0.003	<0.003

Prochloraz	mg/l	<0.007	<0.007	<0.007	<0.007
Prometryn	mg/l	<0.005	<0.005	<0.005	<0.005
Propazine	mg/l	<0.002	<0.002	<0.002	<0.002
Propetamphos	mg/l	<0.005	<0.005	<0.005	<0.005
Propyzamide	mg/l	<0.005	<0.005	<0.005	<0.005
Simazine	mg/l	<0.003	<0.003	<0.003	<0.003
Terbutryn	mg/l	<0.004	<0.004	<0.004	<0.004
Triazophos	mg/l	<0.005	<0.005	<0.005	<0.005
Trietazine	mg/l	<0.002	<0.002	<0.002	<0.002
Bifenthrin	mg/l	<0.001	<0.001	<0.001	<0.001
Cyfluthrin	mg/l	<0.003	<0.003	<0.003	<0.003
Cypermethrin	mg/l	<0.002	<0.002	<0.002	<0.002
Cypermethrin Identification	mg/l	Not detected.	Not detected.	Not detected.	Not detected.
Deltamethrin	mg/l	<0.002	<0.002	<0.002	<0.002
Flumethrin	mg/l	-	-	-	-
Lambda-cyhalothrin	mg/l	<0.002	<0.002	<0.002	<0.002
cis-Permethrin	mg/l	<0.002	<0.002	<0.002	<0.002
trans-Permethrin	mg/l	<0.001	<0.001	<0.001	<0.001
1,2-Dichloroethane	mg/l	-	<0.1	<0.1	<0.1
Benzene	mg/l	-	<0.1	<0.1	<0.1
Bromodichloromethane	mg/l	-	<0.1	<0.1	<0.1
Bromoform :- {Tribromomethane}	mg/l	-	<0.1	<0.1	<0.1
Chloroform :- {Trichloromethane}	mg/l	-	<0.1	<0.1	<0.1

June 2019 Groundwater Monitoring Results.

		Site 1. Silent Pool 11/09/19	Site 2. Cemetery 11/09/19	Site 3. Frontier 11/09/19	Site 4. Four Corners 11/09/19	Site 5. Runway 11/09/19
Analyte	Units					
Alkalinity to pH 4.5 as CaCO ₃	mg/l	169	189	222	Unable to access site	352
Ammoniacal Nitrogen as N	mg/l	<0.0300	0.077	<0.0300		<0.0300
Chloride	mg/l	1580	28.3	77.3		203
Nitrite as N	mg/l	<0.00400	0.0119	<0.00400		<0.00400
Nitrogen : Total Oxidised as N	mg/l	6.27	7.77	4.92		1.85
Carbon, Organic : Total as C :- {TOC}	mg/l	0.9	1.3	0.9		1

Solids, Suspended at 105 C	mg/l	-	<3	3.77	9.77
Arsenic	mg/l	<1	3.89	1.92	5.61
Cadmium	mg/l	<0.1	<0.1	0.55	<0.1
Lead	mg/l	<2	2.03	<2	<2
Zinc	mg/l	12.2	63.6	251	38.6
Calcium	mg/l	119	75.9	67.3	105
Magnesium	mg/l	106	6.94	26.6	34.3
Potassium	mg/l	30.5	7.14	4.19	14.7
Sodium	mg/l	823	22.3	46.4	128
Sulphate as SO4	mg/l	233	29	41.5	44.1
Mercury	mg/l	-	<0.01	<0.01	<0.01
Bicarbonate as HCO3	mg/l	-	231	271	429
Nitrate as N	mg/l	-	7.76	<4.92	<1.85
Hydrocarbons Screen >C5 - C44	mg/l	-	-	-	-
1,2,3-Trichlorobenzene	mg/l	<0.01	<0.01	<0.01	-
1,2,4-Trichlorobenzene	mg/l	<0.01	<0.01	<0.01	-
1,3,5-Trichlorobenzene	mg/l	<0.01	<0.01	<0.01	-
2,3,5,6-Tetrachloroaniline	mg/l	<0.001	<0.001	<0.001	-
2,3,5,6-Tetrachlorothioanisole	mg/l	<0.001	<0.001	<0.001	-
Aldrin	mg/l	<0.001	<0.001	<0.001	-
Chlorothalonil	mg/l	<0.001	<0.001	<0.001	-
Chlorpropham	mg/l	<0.005	<0.005	<0.006	-
DDE -op	mg/l	<0.001	<0.001	<0.001	-
DDE -pp	mg/l	<0.001	<0.001	<0.001	-
DDT -op	mg/l	<0.003	<0.003	<0.003	-
DDT -pp	mg/l	<0.002	<0.002	<0.002	-
Dichlobenil :- {2,6-Dichlorobenzonitrile }	mg/l	<0.001	<0.001	<0.001	-
Dieldrin	mg/l	<0.002	<0.002	<0.002	-
Endosulfan A	mg/l	<0.003	<0.003	<0.003	-
Endosulfan B	mg/l	<0.004	<0.004	<0.004	-
Endrin	mg/l	<0.003	<0.003	<0.003	-
HCH -alpha	mg/l	<0.003	<0.003	<0.003	-
HCH -beta	mg/l	<0.003	<0.003	<0.003	-
HCH -delta	mg/l	<0.001	<0.001	<0.001	-
HCH -epsilon	mg/l	<0.003	<0.003	<0.003	-
HCH -gamma :- {Lindane}	mg/l	<0.003	<0.003	<0.003	-
Heptachlor	mg/l	<0.001	<0.001	<0.001	-

Hexachlorobenzene	mg/l	<0.001	<0.001	<0.001	-
Hexachlorobutadiene	mg/l	<0.003	<0.003	<0.003	-
Isodrin	mg/l	<0.001	<0.001	<0.001	-
Methoxychlor	mg/l	<0.001	<0.001	<0.001	-
Pendimethalin	mg/l	<0.01	<0.01	<0.01	-
Pentachlorobenzene	mg/l	<0.001	<0.001	<0.001	-
Propachlor	mg/l	<0.001	<0.001	<0.001	-
TDE - op	mg/l	<0.001	<0.001	<0.001	-
TDE - pp	mg/l	<0.002	<0.002	<0.002	-
Tecnazene	mg/l	<0.001	<0.001	<0.001	-
Tri-allate	mg/l	<0.007	<0.007	<0.007	-
Trifluralin	mg/l	<0.002	<0.002	<0.002	-
Vinclozolin	mg/l	<0.002	<0.002	<0.002	-
cis-Chlordane	mg/l	<0.001	<0.001	<0.001	-
cis-Heptachlor epoxide	mg/l	<0.003	<0.003	<0.003	-
trans-Chlordane	mg/l	<0.001	<0.001	<0.001	-
trans-Heptachlor epoxide	mg/l	<0.003	<0.003	<0.003	-
Atrazine	mg/l	<0.003	<0.003	<0.003	<0.003
Atrazine-desethyl	mg/l	<0.02	<0.02	<0.02	<0.02
Atrazine-desisopropyl	mg/l	<0.02	<0.02	<0.02	<0.02
Azinphos-ethyl	mg/l	<0.006	<0.006	<0.006	<0.006
Azinphos-methyl	mg/l	<0.003	<0.003	<0.003	<0.003
Bendiocarb	mg/l	<0.005	<0.005	<0.005	<0.005
Bupirimate	mg/l	<0.005	<0.005	<0.005	<0.005
Carbophenothion	mg/l	<0.005	<0.005	<0.005	<0.005
Chlorfenvinphos	mg/l	<0.01	<0.01	<0.01	<0.01
Chlorpyrifos-ethyl	mg/l	<0.002	<0.002	<0.002	<0.002
Chlorpyrifos-methyl	mg/l	<0.001	<0.001	<0.001	<0.001
Coumaphos	mg/l	<0.005	<0.005	<0.005	<0.005
Cyanazine	mg/l	<0.006	<0.006	<0.006	<0.006
Desmetryn	mg/l	<0.005	<0.005	<0.005	<0.005
Diazinon	mg/l	<0.001	<0.001	<0.001	<0.001
Dichlorvos	mg/l	<0.004	<0.004	<0.004	<0.004
Dimethoate	mg/l	<0.006	<0.006	<0.006	<0.006
Ethion	mg/l	<0.005	<0.005	<0.005	<0.005
Ethofumesate	mg/l	<0.005	<0.005	<0.005	<0.005
Fenclorphos	mg/l	<0.005	<0.005	<0.005	<0.005
Fenitrothion	mg/l	<0.001	<0.001	<0.001	<0.001
Fenpropimorph	mg/l	<0.007	<0.007	<0.007	<0.007
Fenthion	mg/l	<0.008	<0.008	<0.008	<0.008
Fonofos	mg/l	<0.001	<0.001	<0.001	<0.001
Iodofenphos	mg/l	<0.001	<0.001	<0.001	<0.001

Iprodione	mg/l	<0.008	<0.008	<0.008	<0.008
Irgarol 1051	mg/l	<0.005	<0.005	<0.005	<0.005
Malathion	mg/l	<0.002	<0.002	<0.002	<0.002
Metalaxyl	mg/l	<0.008	<0.008	<0.008	<0.008
Metazachlor	mg/l	<0.005	<0.005	<0.005	<0.005
Mevinphos	mg/l	<0.008	<0.008	<0.008	<0.008
Napropamide	mg/l	<0.005	<0.005	<0.005	<0.005
Parathion-ethyl	mg/l	<0.004	<0.004	<0.004	<0.004
Parathion-methyl	mg/l	<0.005	<0.005	<0.005	<0.005
Phorate	mg/l	<0.02	<0.02	<0.02	<0.02
Pirimicarb	mg/l	<0.004	<0.004	<0.004	<0.004
Pirimiphos-ethyl	mg/l	<0.005	<0.005	<0.005	<0.005
Pirimiphos-methyl	mg/l	<0.003	<0.003	<0.003	<0.003
Prochloraz	mg/l	<0.007	<0.007	<0.007	<0.007
Prometryn	mg/l	<0.005	<0.005	<0.005	<0.005
Propazine	mg/l	<0.002	<0.002	<0.002	<0.002
Propetamphos	mg/l	<0.005	<0.005	<0.005	<0.005
Propyzamide	mg/l	<0.005	<0.005	<0.005	<0.005
Simazine	mg/l	<0.003	<0.003	<0.003	<0.003
Terbutryn	mg/l	<0.004	<0.004	<0.004	<0.004
Triazophos	mg/l	<0.005	<0.005	<0.005	<0.005
Trietazine	mg/l	<0.002	<0.002	<0.002	<0.002
Bifenthrin	mg/l	<0.001	<0.001	<0.001	<0.001
Cyfluthrin	mg/l	<0.003	<0.003	<0.003	<0.003
Cypermethrin	mg/l	<0.002	<0.002	<0.002	<0.002
Cypermethrin Identification	mg/l	Not detected.	Not detected.	Not detected.	Not detected.
Deltamethrin	mg/l	<0.002	<0.002	<0.002	<0.002
Flumethrin	mg/l	-	-	-	-
Lambda-cyhalothrin	mg/l	<0.002	<0.002	<0.002	<0.002
cis-Permethrin	mg/l	<0.002	<0.002	<0.002	<0.002
trans-Permethrin	mg/l	<0.001	<0.001	<0.001	<0.001
1,2-Dichloroethane	mg/l	-	<0.1	<0.1	<0.1
Benzene	mg/l	-	<0.1	<0.1	<0.1
Bromodichloromethane	mg/l	-	<0.1	<0.1	<0.1
Bromoform {Tribromomethane}	:- mg/l	-	<0.1	<0.1	<0.1
Chloroform {Trichloromethane}	:- mg/l	-	<0.1	<0.1	<0.1

September 2019 Groundwater Monitoring Results.

		Site 1. Silent Pool 10/12/19	Site 2. Cemetery 10/12/19	Site 3. Frontier 10/12/19	Site 4. Four Corners 10/12/19	Site 5. Runway 10/12/19
Analyte	Units					
Alkalinity to pH 4.5 as CaCO ₃	mg/l	164	175	unable to access site	unable to access site	339
Ammoniacal Nitrogen as N	mg/l	<0.0300	<0.0300			<0.0300
Chloride	mg/l	1600	24.4			342
Nitrite as N	mg/l	0.0042	<0.00400			<0.00400
Nitrogen : Total Oxidised as N	mg/l	5.83	7.63			5.04
Carbon, Organic : Total as C :- {TOC}	mg/l	1.3	<0.7			1.8
Solids, Suspended at 105 C	mg/l	-	<3			13.1
Arsenic	mg/l	<1	3.76			8.82
Cadmium	mg/l	<0.1	<0.1			<0.1
Lead	mg/l	<2	<2			<2
Zinc	mg/l	55.9	28.2			35
Calcium	mg/l	126	72.1			131
Magnesium	mg/l	115	6.78			41.7
Potassium	mg/l	33.2	6.7			16.4
Sodium	mg/l	954	20.5			184
Sulphate as SO ₄	mg/l	240	26.7			55.3
Mercury	mg/l	-	<0.01			<0.01
Bicarbonate as HCO ₃	mg/l	-	214			414
Nitrate as N	mg/l	-	<7.63			<5.04
Hydrocarbons Screen >C ₅ - C ₄₄	mg/l	-	-			-
1,2,3-Trichlorobenzene	mg/l	<0.01	<0.01			<0.01
1,2,4-Trichlorobenzene	mg/l	<0.01	<0.01			<0.01
1,3,5-Trichlorobenzene	mg/l	<0.01	<0.01			<0.01
2,3,5,6-Tetrachloroaniline	mg/l	<0.001	<0.001			<0.001
2,3,5,6-Tetrachlorothioanisole	mg/l	<0.001	<0.001			<0.001
Aldrin	mg/l	<0.001	<0.001			<0.001
Chlorothalonil	mg/l	<0.001	<0.001			<0.001
Chlorpropham	mg/l	<0.005	<0.005			<0.005
DDE -op	mg/l	<0.001	<0.001			<0.001
DDE -pp	mg/l	<0.001	<0.001			0.0427
DDT -op	mg/l	<0.003	<0.003			0.00831

DDT -pp	mg/l	<0.002	<0.002	0.0471
Dichlobenil :- {2,6-Dichlorobenzonitrile }	mg/l	<0.001	<0.001	<0.001
Dieldrin	mg/l	<0.002	<0.002	<0.002
Endosulfan A	mg/l	<0.003	<0.003	<0.003
Endosulfan B	mg/l	<0.004	<0.004	<0.004
Endrin	mg/l	<0.003	<0.003	<0.003
HCH -alpha	mg/l	<0.003	<0.003	<0.003
HCH -beta	mg/l	<0.003	<0.003	<0.003
HCH -delta	mg/l	<0.001	<0.001	<0.001
HCH -epsilon	mg/l	<0.003	<0.003	<0.003
HCH -gamma :- {Lindane}	mg/l	<0.003	<0.003	<0.003
Heptachlor	mg/l	<0.001	<0.001	<0.001
Hexachlorobenzene	mg/l	<0.001	<0.001	<0.001
Hexachlorobutadiene	mg/l	<0.003	<0.003	<0.003
Isodrin	mg/l	<0.001	<0.001	<0.001
Methoxychlor	mg/l	<0.001	<0.001	<0.001
Pendimethalin	mg/l	<0.01	<0.01	<0.01
Pentachlorobenzene	mg/l	<0.001	<0.001	<0.001
Propachlor	mg/l	<0.001	<0.001	<0.001
TDE - op	mg/l	<0.001	<0.001	0.00163
TDE - pp	mg/l	<0.002	<0.002	0.00905
Tecnazene	mg/l	<0.001	<0.001	<0.001
Tri-allate	mg/l	<0.006	<0.006	<0.006
Trifluralin	mg/l	<0.002	<0.002	<0.002
Vinclozolin	mg/l	<0.002	<0.002	<0.002
cis-Chlordane	mg/l	<0.001	<0.001	<0.001
cis-Heptachlor epoxide	mg/l	<0.003	<0.003	<0.003
trans-Chlordane	mg/l	<0.001	<0.001	<0.001
trans-Heptachlor epoxide	mg/l	<0.003	<0.003	<0.003
Atrazine	mg/l	<0.003	<0.003	<0.003
Atrazine-desethyl	mg/l	<0.02	<0.02	<0.02
Atrazine-desisopropyl	mg/l	<0.02	<0.02	<0.02
Azinphos-ethyl	mg/l	<0.006	<0.006	<0.006
Azinphos-methyl	mg/l	<0.003	<0.003	<0.003
Bendiocarb	mg/l	<0.005	<0.005	<0.005
Bupirimate	mg/l	<0.005	<0.005	<0.005
Carbophenothion	mg/l	<0.005	<0.005	<0.005
Chlorfenvinphos	mg/l	<0.01	<0.01	<0.01
Chlorpyrifos-ethyl	mg/l	<0.002	<0.002	<0.002
Chlorpyrifos-methyl	mg/l	<0.001	<0.001	<0.001

Coumaphos	mg/l	<0.005	<0.005	<0.005
Cyanazine	mg/l	<0.006	<0.006	<0.006
Desmetryn	mg/l	<0.005	<0.005	<0.005
Diazinon	mg/l	<0.001	<0.001	<0.001
Dichlorvos	mg/l	<0.004	<0.004	<0.004
Dimethoate	mg/l	<0.006	<0.006	<0.006
Ethion	mg/l	<0.005	<0.005	<0.005
Ethofumesate	mg/l	<0.005	<0.005	<0.005
Fenclorphos	mg/l	<0.005	<0.005	<0.005
Fenitrothion	mg/l	<0.001	<0.001	<0.001
Fenpropimorph	mg/l	<0.007	<0.007	<0.007
Fenthion	mg/l	<0.008	<0.008	<0.008
Fonofos	mg/l	<0.001	<0.001	<0.001
Iodofenphos	mg/l	<0.001	<0.001	<0.001
Iprodione	mg/l	<0.008	<0.008	<0.008
Irgarol 1051	mg/l	<0.005	<0.005	<0.005
Malathion	mg/l	<0.002	<0.002	<0.002
Metalaxyl	mg/l	<0.008	<0.008	<0.008
Metazachlor	mg/l	<0.005	<0.005	<0.005
Mevinphos	mg/l	<0.008	<0.008	<0.008
Napropamide	mg/l	<0.005	<0.005	<0.005
Parathion-ethyl	mg/l	<0.004	<0.004	<0.004
Parathion-methyl	mg/l	<0.005	<0.005	<0.005
Phorate	mg/l	<0.02	<0.02	<0.02
Pirimicarb	mg/l	<0.004	<0.004	<0.004
Pirimiphos-ethyl	mg/l	<0.005	<0.005	<0.005
Pirimiphos-methyl	mg/l	<0.003	<0.003	<0.003
Prochloraz	mg/l	<0.007	<0.007	<0.007
Prometryn	mg/l	<0.005	<0.005	<0.005
Propazine	mg/l	<0.002	<0.002	<0.002
Propetamphos	mg/l	<0.005	<0.005	<0.005
Propyzamide	mg/l	<0.005	<0.005	<0.005
Simazine	mg/l	<0.003	<0.003	<0.003
Terbutryn	mg/l	<0.004	<0.004	<0.004
Triazophos	mg/l	<0.005	<0.005	<0.005
Trietazine	mg/l	<0.002	<0.002	<0.002
Bifenthrin	mg/l	<0.001	<0.001	<0.001
Cyfluthrin	mg/l	<0.003	<0.003	<0.003
Cypermethrin	mg/l	<0.002	<0.002	<0.002
Cypermethrin Identification	mg/l	Not detected.	Not detected.	Not detected.
Deltamethrin	mg/l	<0.002	<0.002	<0.002
Flumethrin	mg/l	-	-	-

Lambda-cyhalothrin	mg/l	<0.002	<0.002	<0.002
cis-Permethrin	mg/l	<0.002	<0.002	<0.002
trans-Permethrin	mg/l	<0.001	<0.001	<0.001
1,2-Dichloroethane	mg/l	-	<0.1	<0.1
Benzene	mg/l	-	<0.1	<0.1
Bromodichloromethane	mg/l	-	<0.1	<0.1
Bromoform :- {Tribromomethane}	mg/l	-	<0.1	<0.1
Chloroform :- {Trichloromethane}	mg/l	-	<0.1	<0.1

December 2019 Groundwater Monitoring Results.

3. Habitats

3.1 Birds

3.1.1 Nesting Birds of Prey

As part of their work, the Gibraltar Ornithological and Natural History Society (GONHS) conducts bird of prey surveys on an annual basis during the breeding season. Records are kept on the nesting of Peregrines *Falco peregrinus*, Common Kestrel *Falco tinnunculus*, and Lesser Kestrel *Falco naumanni*. These records are shown in the following section.

3.1.1.1 Lesser and Common Kestrel

Year	Lesser Kestrel	Common Kestrel
2010	16	11
2011	18	9
2012	13	8
2013	5	5
2014	4	6
2015	4	7
2016	1	7
2017	1	8
2018	0	5
2019	0	8

Breeding Pairs of Lesser Kestrel & Common Kestrel in Gibraltar.

In recent years, the presence of the Lesser Kestrel has steadily declined and has now been lost as a nesting species in Gibraltar for the first time in several decades. This is mainly due to the loss of feeding habitats north of the border in Spain. In 2019, only two females of Lesser Kestrel were recorded in Gibraltar.

3.1.1.2 Peregrine Falcon (young fledged by site)

Year	North face	Catalan Bay	Both Worlds	Oil Tanks	Med Steps	Camp Bay	Europa	Apes Den	Total
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
2018	0	3	3	2	0		3	2	13
2019	2	2	0	2	3		3	0	12

Blank entries denote no pairs present at this site

Locations and Breeding Success of Peregrines in Gibraltar.

3.1.2 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 2997 yellow-legged gulls were culled in 2019.

	Adults	1 st /yr	2 nd /yr	3 rd /yr	Juvenile	Total
January	287	4	0	12	0	303
February	336	32	26	32	0	426
March	363	5	5	25	0	398
April	247	22	22	22	0	313
May	518	14	13	15	0	560
June	317	47	20	33	152	569
July	14	0	0	0	39	53
August	0	0	0	0	0	0
(counts)						
September	0	0	0	0	0	0
(counts)						
October	84	8	6	3	0	101
(counts)						
November	159	16	13	15	0	203
December	59	0	3	9	0	71
Total	2384	148	108	166	191	2997

Total Yellow-legged Gulls Culled in 2019.

3.2 Mammals

3.2.1 Barbary Macaques

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
2018	245	10	23	9
2019	247	10	25	15

Barbary Macaque demographics.

Rock Gun	22
Middle Hill	23
Cable Car	28
Prince Philips Arch	22
Ohara`s Battery	7
Eastside	7
Anglian Way	50
Apes Den	40
Anglian Way 2	41
Farringdons/Moorish Castle	7

Barbary Macaque population and distribution data.

4. Waste

4.1 Hazardous Waste

Hazardous waste materials are stored under strict license 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 2019.

Waste Code	Description of Waste	Total Exported (tonnes)
15 01 10*	Packaging containing residues of or contaminated by dangerous substances.	0.1
06 02 04*	Sodium and potassium hydroxide	0.6
17 06 05*	Construction Materials containing asbestos	0.2
20 01 21*	Fluorescent tubes and other mercury containing waste	0.9
20 01 36	Discarded Electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 0135	1
20 01 33*	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	1.1
16 02 11*	Discarded equipment containing Chlorofluorocarbons, HCFC, HFC	52.7
16 02 13*	Waste Electric and Electronic Equipment	65
16 07 08*	Wastes containing oils	7
13 07 03*	Other Fuels (Including Mixtures)	2300
13 07 03*	Other Fuels (Including Mixtures)	2839
16 05 04*	Gases in pressure containers (Including Halons) containing dangerous substances	0.1

16 05 06*	Lab chemicals consisting of containing dangerous substances, including mixtures of laboratory chemicals	0.75
16 01 07*	Oil Filters	0.85
15 02 02*	Absorbents, filter materials (Including oil filters not otherwise specified), wiping cloths and protective clothing damaged by dangerous substances	6.32
16 06 01*	Lead batteries	43.98
20 01 35*	Discarded Electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 0135	450.54
12 01 16*	Waste blasting material containing dangerous substances	1476.19
15 02 02*	Absorbents, filter materials (Including oil filters not otherwise specified), wiping cloths and protective clothing damaged by dangerous substances	19
15 01 10*	Packaging containing residues of or contaminated by dangerous substances	0.98
08 01 11*	Waste paint and varnish containing organic solvents or other dangerous substances	9.25
14 06 03*	Other solvents and Solvent mixtures	1.69
16 05 06*	Laboratory chemicals consisting of or containing dangerous substances including mixtures of laboratory chemicals	0.42
17 06 05*	Construction Materials containing asbestos	10.83
13 07 03*	Other fuel (including mixtures)	0.82
10 01 04*	Oily fly ash and boiler dust	11.59
13 05 02*	Sludge from oil/water separators	0.73
18 01 03*	Waste whose collection and disposal is subject to special requirements to prevent infection	10.1
18 01 09	Medicines other than those mentioned in 180109	0.8
17 05 03	Soil and stones containing dangerous substances	140.68
18 01 08*	Cytotoxic & cytostatic medicines	1.75
19 08 11*	Sludge containing dangerous substances from the biological treatment of industrial waste water	19.2
16 01 07	Oil Filters	1.7
15 02 02*	Absorbents, filter materials (Including oil filters not otherwise specified), wiping cloths and protective clothing damaged by dangerous substances	89.2
15 01 10*	Packaging containing residues of or contaminated by dangerous substances.	37.6

17 06 05*	Construction Materials containing asbestos	21.26
17 05 03*	Soil and stones containing dangerous substances	1160.76
12 01 16*	Waste blasting material containing dangerous substances	32.32
13 04 03*	Bilge oils from other navigation	3000
20 03 01, 20 03 03, 20 03 99	Mixed municipal waste, street-cleaning residues, municipal wastes not otherwise specified	24803.62
13 07 03*	Other Fuels (Including Mixtures)	15300M3
13 07 03*	Other Fuels (Including Mixtures)	8898M3
15 02 02*	Absorbents, filter materials (Including oil filters not otherwise specified), wiping cloths and protective clothing damaged by dangerous substances	10.7
14 06 02*	Other halogenated solvents and solvent mixtures	0.3
19 01 13*	fly ash containing dangerous substances	2.67
19 01 11*	Bottom ash and slag containing dangerous substances	16.91
18 01 03*	Waste whose collection and disposal is subject to special requirements to prevent infection	43.9
18 01 08*	Cytotoxic & cytostatic medicines	1.87
17 06 05*	Construction Materials containing asbestos	21.97
08 01 11*	Waste paint and varnish containing	9.09
16 03 05*	Organic wastes containing dangerous substances	10.06
20 01 23	Discarded equipment containing chlorofluorocarbons	109.01
08 01 11*	Varnish containing organic solvents or other dangerous substances	24.06
15 01 10*	Packaging containing residues of or contaminated by dangerous substances	2.07
06 02 04*	Sodium and potassium hydroxide	1.27
07 02 13	Waste Plastics	2
20 01 21*	Fluorescent tubes and other mercury containing waste	2.45
20 01 36	Discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	6.4
20 01 33*	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	0.2
16 05 04*	Gases in pressure containers (Including Halons) containing dangerous substances	0.2

16 10 01*	Aqueous liquid wastes containing dangerous substances	20.9
16 05 06*	Laboratory chemicals consisting of or containing dangerous substances including mixtures of laboratory chemicals	1.2
17 06 05*	Construction Materials containing asbestos	27.64
18 01 03*	Wastes whose collection and disposal is subject to special requirements in order to prevent infection	10.8
18 01 09	Medicines other than those mentioned in 180108	3.8
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	5.94
13 05 02*	Sludge from oil/water separators	0.33
19 01 13*	Fly ash containing dangerous substances	2.02
19 01 11*	Bottom ash and slag containing dangerous substances	5.74
15 02 02*	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	2.8
12 01 13*	Packaging containing residues of or contaminated by dangerous substances	136.21
20 03 01 20 03 99	Mixed municipal waste, municipal wastes not otherwise specified	
18 01 08*	Cytotoxic and Cytostatic medicines	0.15

Trans-frontier shipments of hazardous waste in 2019.

4.2 Municipal Waste

Month	Refuse (Kgs)	Bulky Items (Kgs)	Mattresses (Kgs)
January	1,513,502	1,211,280	0
February	1,176,420	1,091,740	0
March	1,611,320	1,118,800	3,240
April	1,424,480	1,218,260	2,820
May	1,545,740	1,371,920	6,540
June	1,163,140	1,182,840	3,320
July	1,361,060	1,272,020	0
August	1,975,880	2,124,520	4,800
September	1,429,960	1,533,720	6,980
October	1,761,100	1,781,840	15,000
November	1,427,020	1,278,960	11,160
December	1,424,540	965,320	7,560
Total	17814162	16151220	61420

Municipal waste in Gibraltar in 2019.

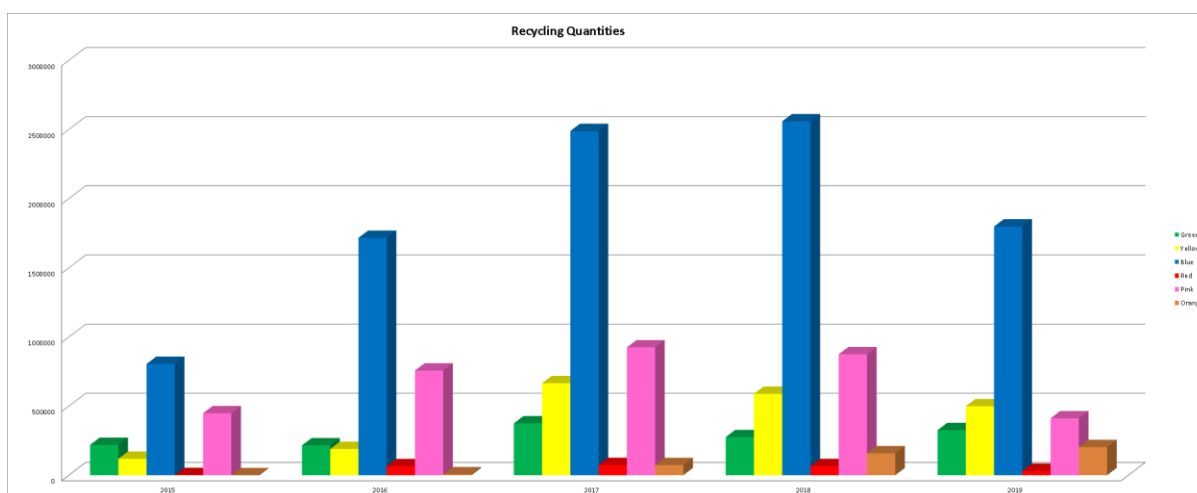
4.3 Recycling

The following data shows rates for recycling in Gibraltar during 2019.

Key	
Bin Colour	Items discarded
Green	Glass
Yellow	Plastic, cans and tetrabrik
Blue	Paper and cardboard
Red	Batteries
Pink	Waste Electrical and Electronic Equipment (WEEE)
Orange	Waste cooking oil

Year 2019	Green Bin	Yellow Bin	Blue Bin	Red Bin	Pink Bin	Orange Bin	Total
Kgs	326000	498440	1798394	31560	411518	203810	3065912

Recycling quantities for 2019.



Recycling quantities (2015-2019).

4.4 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:	2019	Imported		Collected		Sent for treatment		Recovery
Categories		Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	Quantity (No.)	Weight (tonnes)	%
Large Household appliances		2729	63.939	6846	272.136	10671.9	388.531	425.6182

Small Household appliances	19889	251.287	640	3.1288	2783	52.565	1.24511
IT and Telecoms Equipment	73391	154.671	3486.0075	20.4553	5292	58.746	13.22504
Consumer Equipment	6145	36.482	410.684	5.606	1644	14.244	15.36648
Lighting equipment	112	112	6432	4.326	2430	6.1	3.8625
Electrical and electronic tools	864	63.704	7	0.055	562	20.4	0.086337
Toys, Leisure & Sports Equipment	0	62.725	5	0.045	194	4.165	0.071742
Medical devices	309	14.018	0	0	57	0.357	0
Monitoring & Control Instruments	73	0.062	0	0	30	0.03	0
Automatic dispensers	76	1.981	5	0.02	0	0	1.009591
TOTAL	103588	760.87	17831.69	305.77	23663.9	545.14	-

WEEE movements and recovery in Gibraltar in 2019.

4.5 Incineration Waste

Data below shows types and weights of incinerated waste dealt with locally, and exported.

Type of Waste	
Clinical Waste Incinerated (Kgs)	398452.5
Clinical waste Exported (Kgs)	48570
Cytotoxic Waste Exported (Kgs)	2527.5
Animal Incinerations (Number)	304
Human Cremations (Number)	65
Other wastes Incinerated (Kgs)	3260
Exported	
Fly Ash Exported (Kgs)	3686
Furnace Ash Exported (Kgs)	23038

Year Month	2019				
	No. of Cont.	Ltrs per Cont	Kgs per Cont	Total Ltrs	Total Kgs
January	5190	60	7.5	311400	38925
February	4810	60	7.5	288600	36075
March	4813	60	7.5	288780	36097.5
April	4901	60	7.5	294060	36757.5
May	4938	60	7.5	296280	37035
June	4706	60	7.5	282360	35295
July	5123	60	7.5	307380	38422.5
August	4975	60	7.5	298500	37312.5
September	4759	60	7.5	285540	35692.5

October	4859	60	7.5	291540	36442.5
November	5005	60	7.5	300300	37537.5
December	5036	60	7.5	302160	37770
Annual Total	59115	-	-	3546900	443362.5

Total amount of clinical waste collected in 2019.

5. Energy

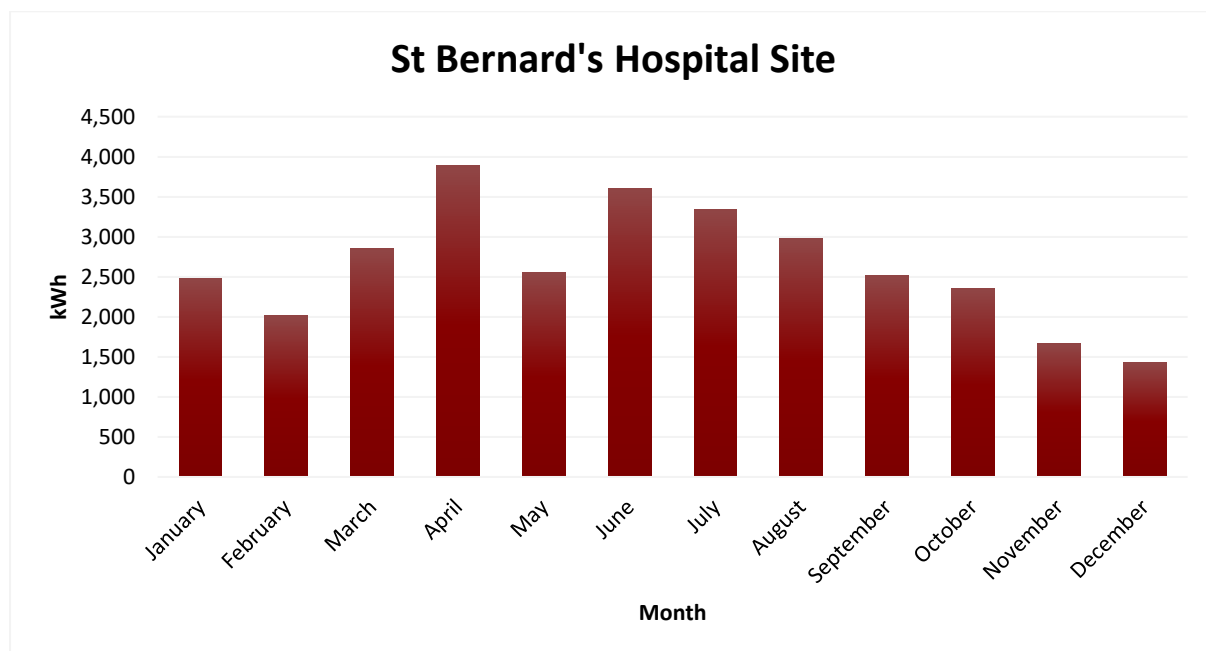
5.1 Lighting

Data below lists the total energy consumption from street, flood and traffic lighting in 2019.

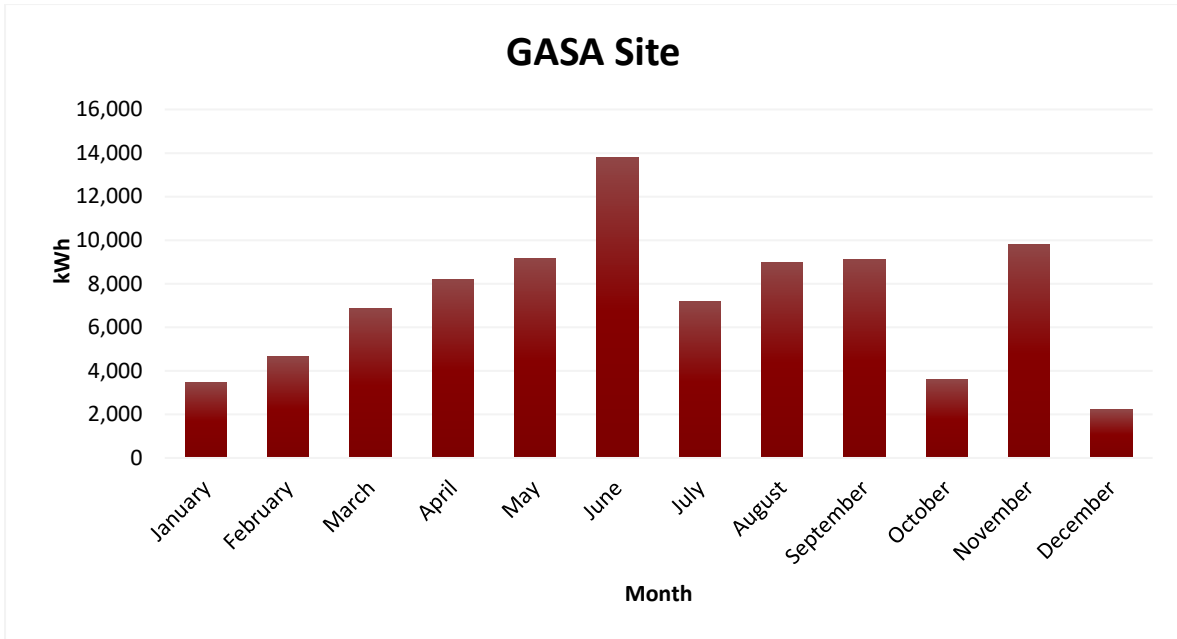
Year 2019	
Kilowatt Hours (kWh)	
Street lighting	1,299,666
Flood lighting	64,001
Traffic lighting	49,694

5.2 Solar Energy

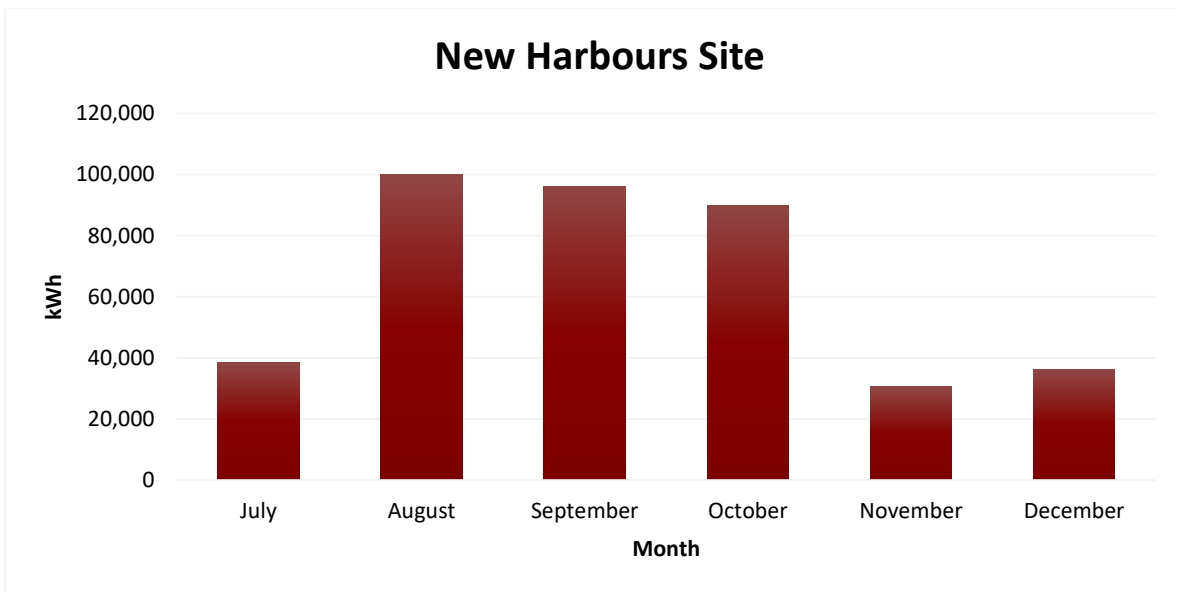
In line with EU targets for sourcing 20% of energy by 2020, H.M. Government of Gibraltar currently has a variety of solar energy projects in place with plans to increase this further. A breakdown of energy produced at existing sites is shown below.



At St Bernard's Hospital, an installed capacity of 26 kW (peak) is in place. During 2019, a total of 31,677 kWh was generated resulting in a saving of £4,118.01.



At GASA, an installed capacity of 87.7 kW (peak) is in place. During 2019, a total of 87,056 kWh was generated resulting in a saving of £11,317.28.



The solar installation at New Harbours began to generate energy in July 2019. During its active months, a total of 391,843 kWh was produced. The solar installation here is the largest of all exiting sites with an installed capacity of 800 kW (peak). During the few months the site was operational, a savings of £50,939.59 was achieved.