

Reykjavík Energy

2023 Annual Report

Appendices



Atmospheric concentrations of H₂S in populated areas and regulatory limits



Table of contents

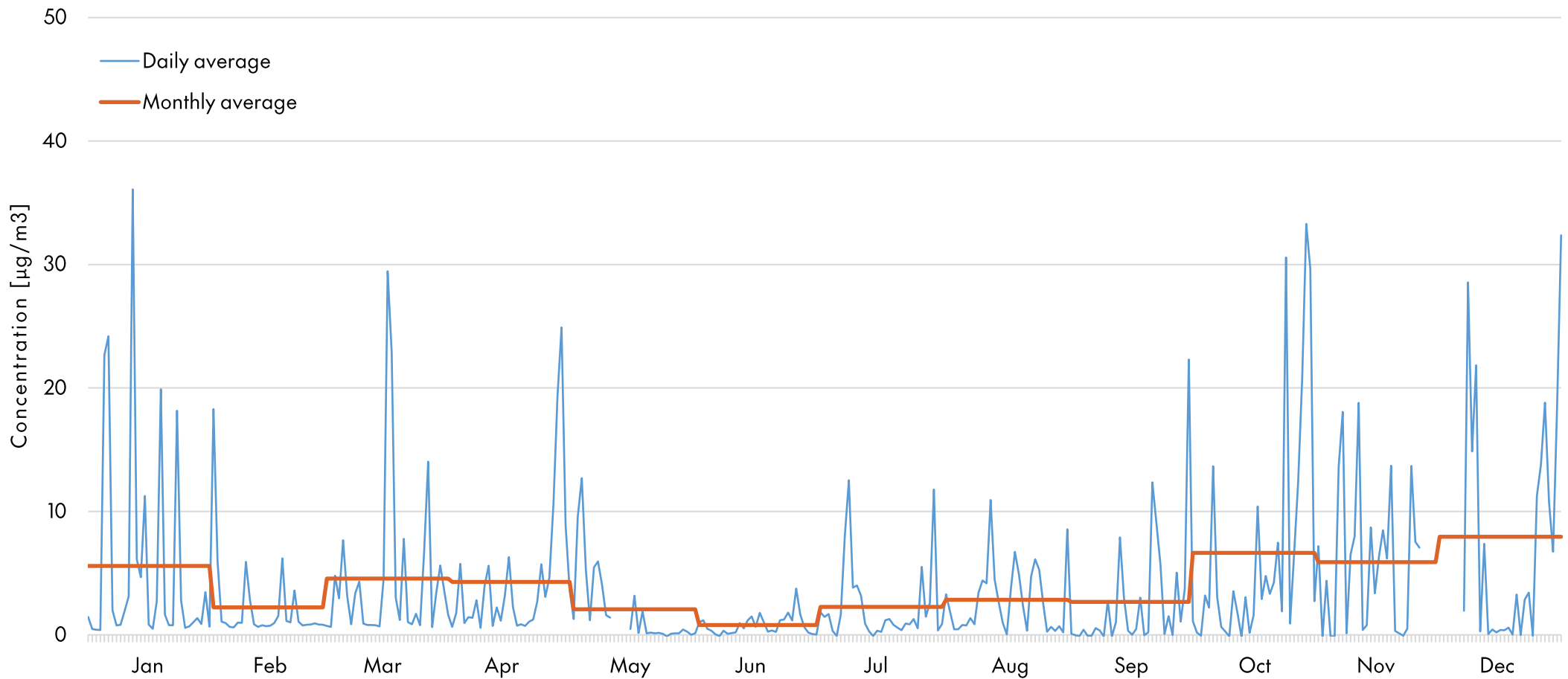
Atmospheric concentration of hydrogen sulphide (H ₂ S) in Nordlingaholt, Hveragerdi, Laekjarbotnar and Ulfarsardalur 2023.....	1
.....	1
Nordlingaholt.....	1
Hveragerdi.....	2
Laekjarbotnar.....	3
Ulfarsardalur.....	4
Atmospheric concentration of hydrogen sulphide (H ₂ S) in Nordlingaholt, Hveragerdi, Laekjarbotnar and Ulfarsardalur 2023.....	5
Nordlingaholt.....	5
Hveragerdi.....	6
Laekjarbotnar.....	7
Ulfarsardalur.....	8
30 highest hourly averages for the atmospheric concentration of hydrogen sulphide in Hveragerdi, Nordlingaholt, Laekjabotnar and Ulfarsardalur.....	9
Comparison between regulatory limits of hydrogen sulphide in µg/m ³ and ppm.....	11

Cover photo: Íris Eva Einarsdóttir

Atmospheric concentration of hydrogen sulphide (H₂S) in Nordlingaholt, Hveragerdi, Laekjarbotnar and Ulfarsardalur 2023

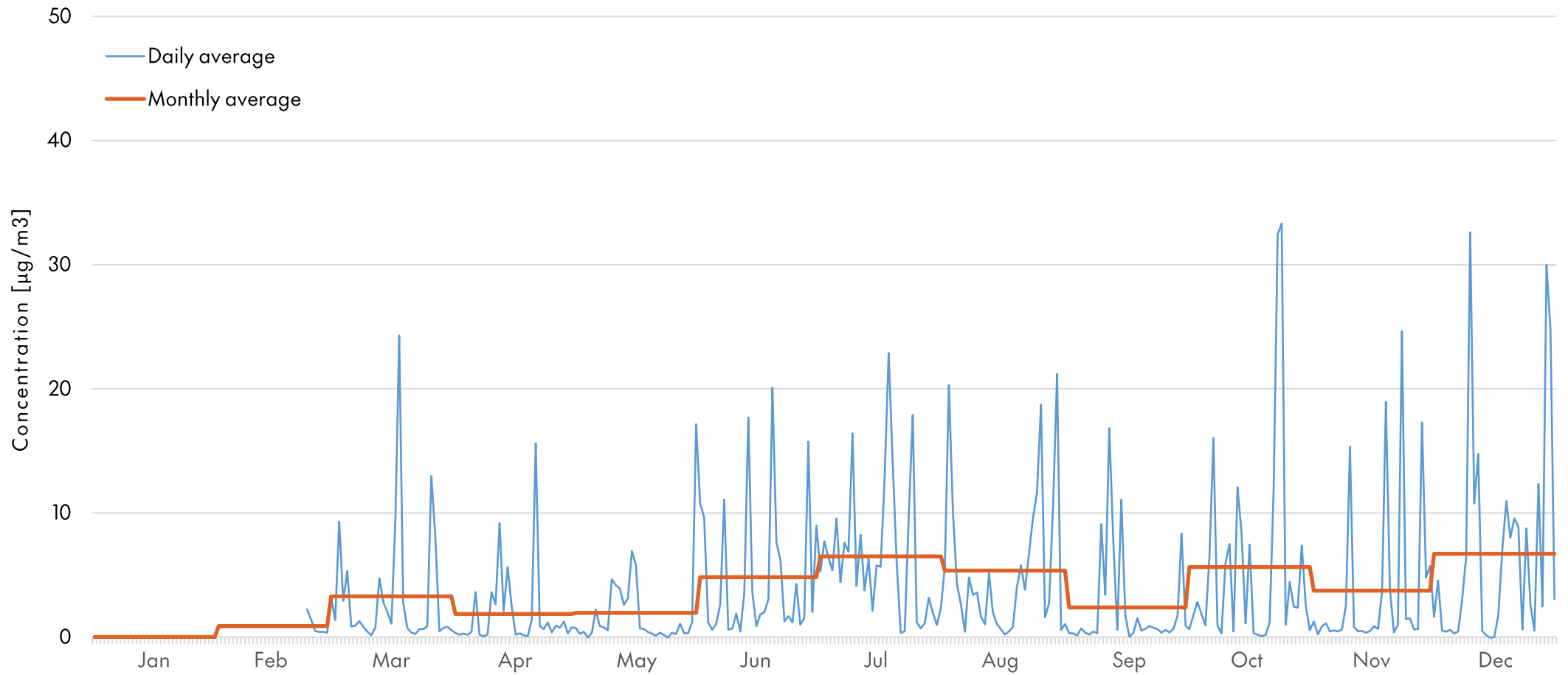
The figures show the daily and monthly averages of the measured concentration of hydrogen sulphide in the atmosphere.

Nordlingaholt

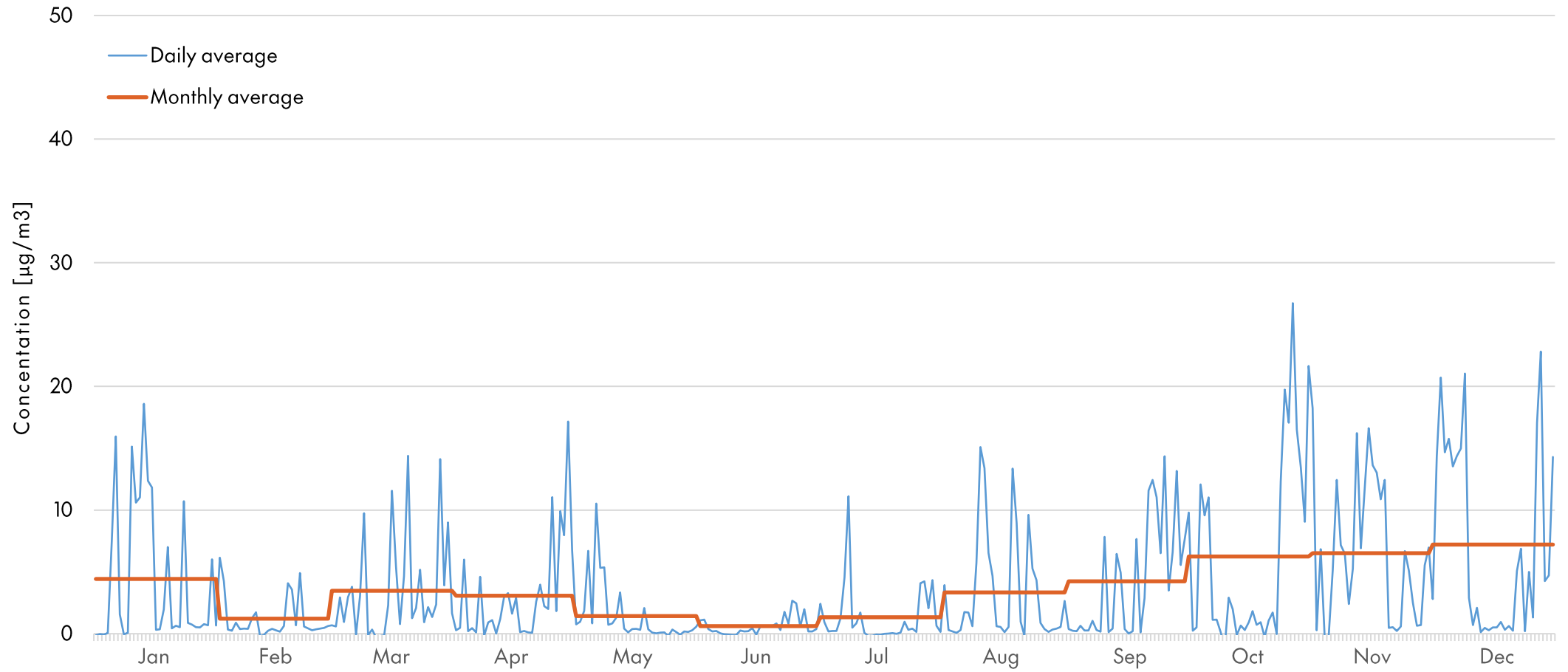


Hveragerdi

The gas meter in Hveragerdi malfunctioned on November 3rd 2022 and no data was logged until late February, when it became operational again.

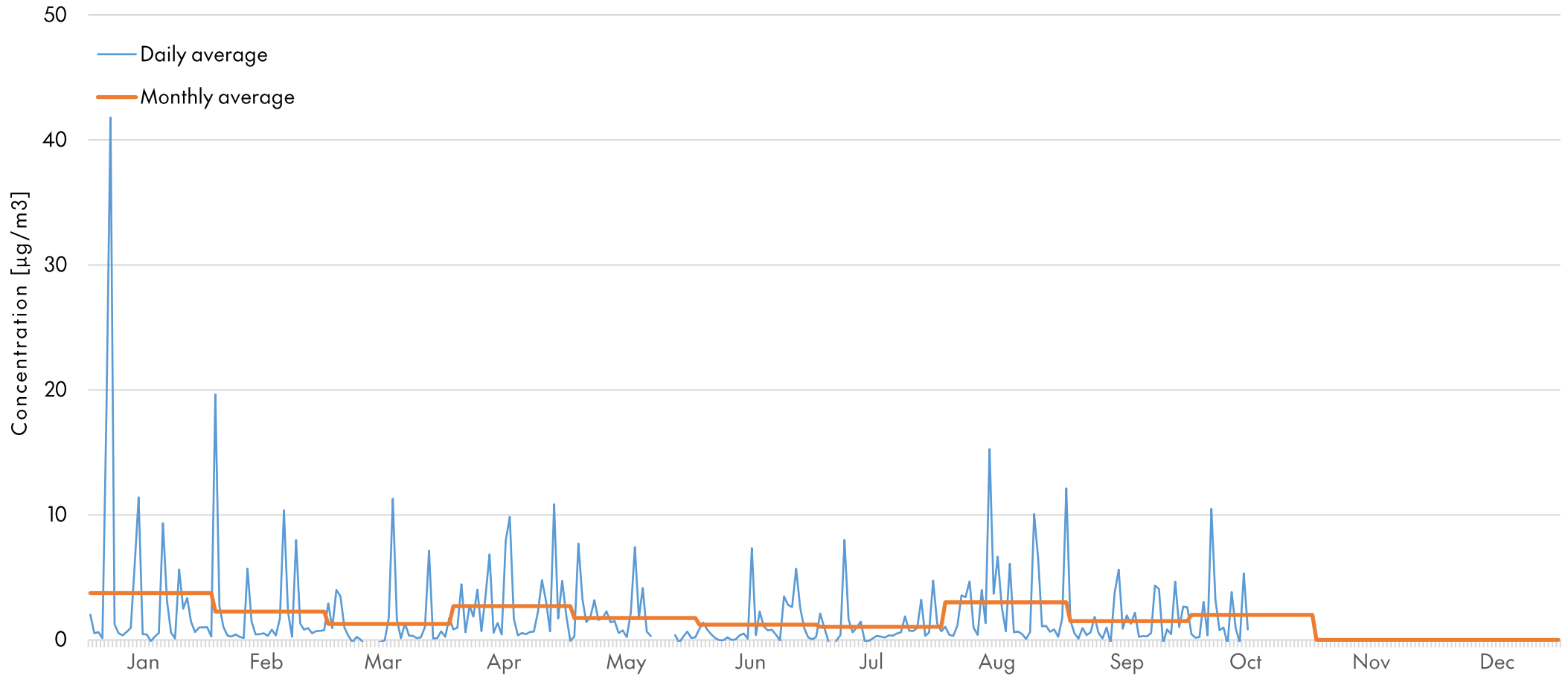


Laekjarbotnar



Ulfarsardalur

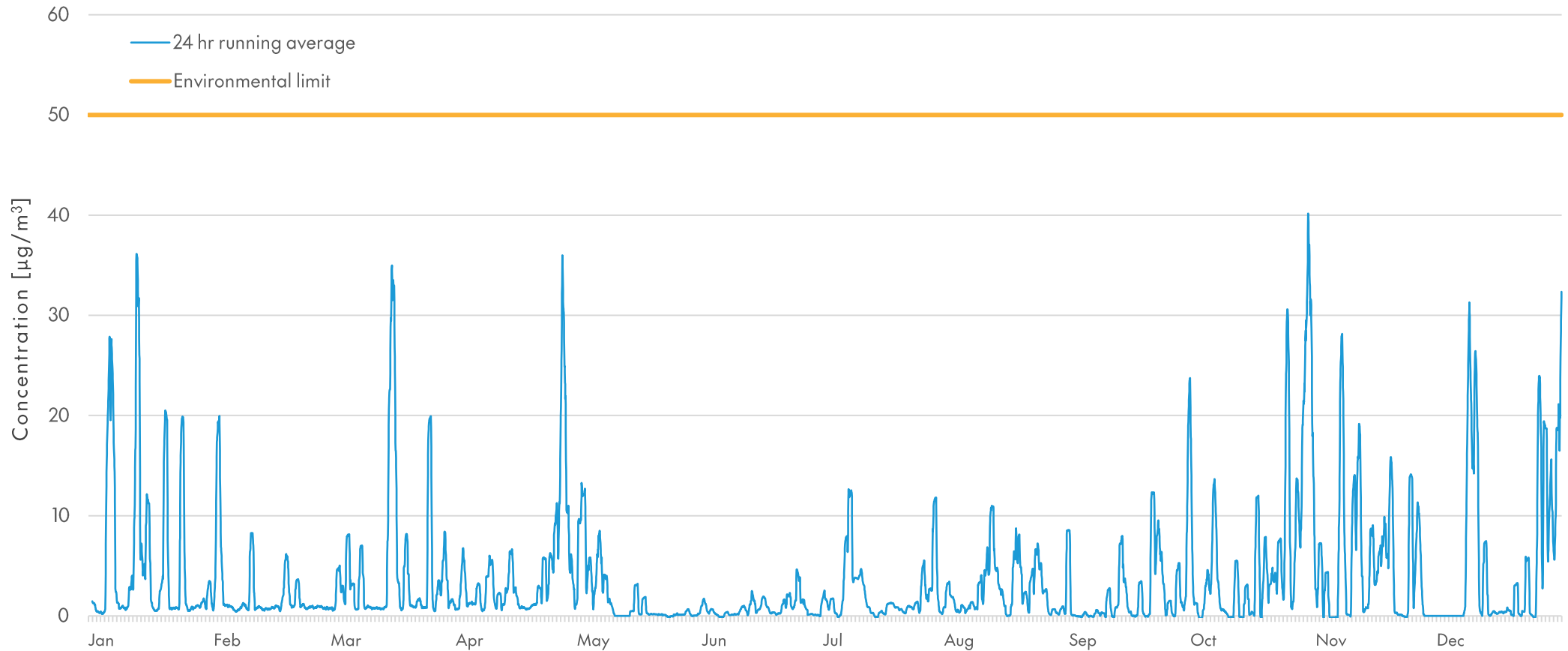
The gas meter in Ulfarsardalur malfunctioned on October 15th and no data was logged after that time.



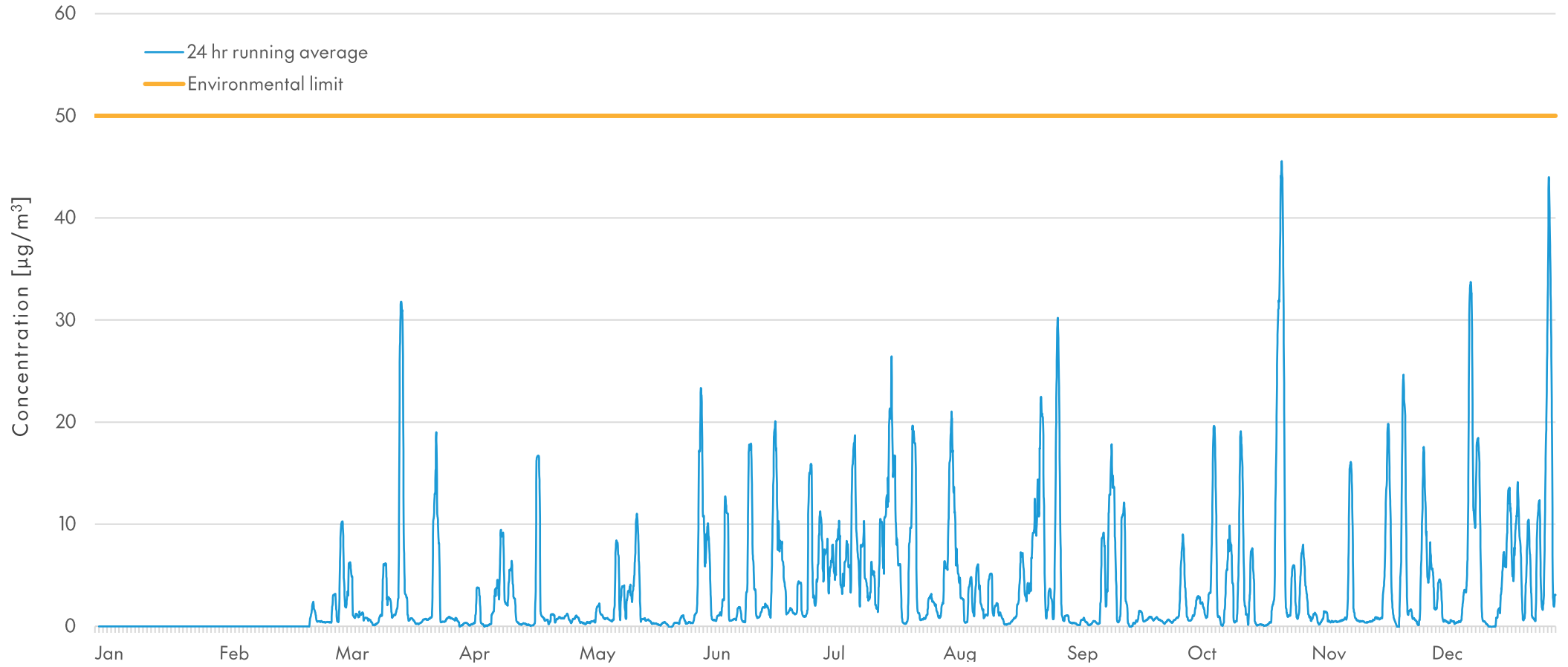
Atmospheric concentration of hydrogen sulphide (H₂S) in Nordlingaholt, Hveragerdi, Laekjarbotnar and Ulfarsardalur 2023

In 2023 the atmospheric concentrations of hydrogen sulphide (H₂S) did not exceed environmental limits. Capture and reinjection of hydrogen sulphide from Hellisheidi power plant was successful and about 61% and over from Nesjavellir power plant. The total amount of hydrogen sulphide emitted by the Nesjavellir and Hellisheidi power plants was 9.2 thousand tonnes in 2023.

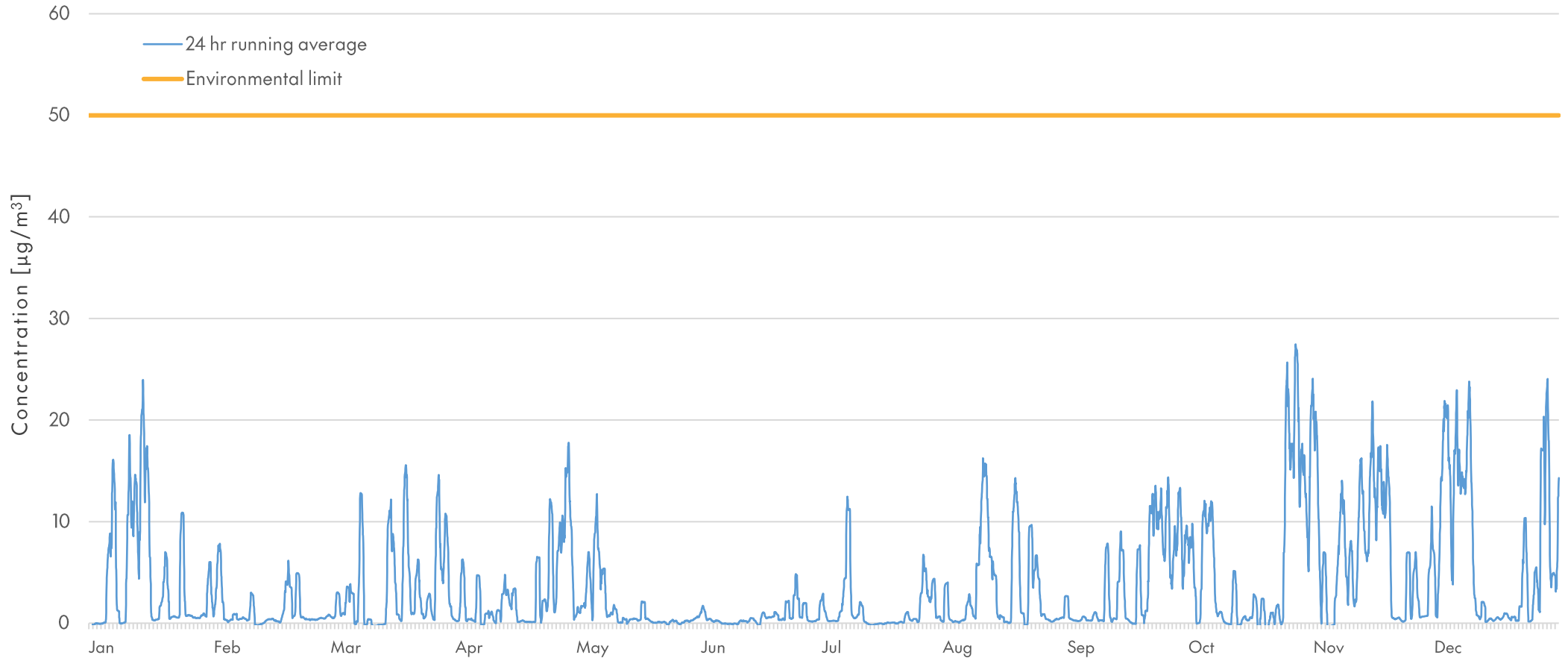
Nordlingaholt



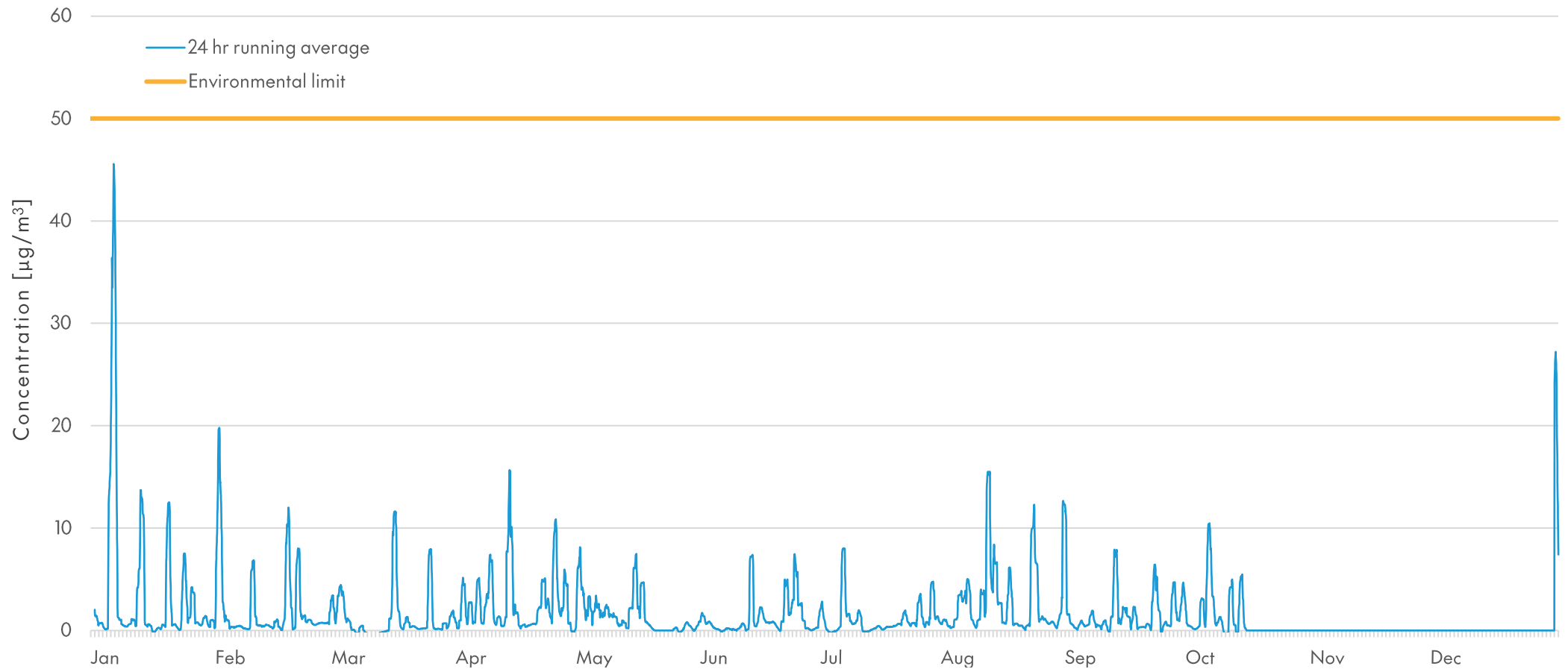
Hveragerdi



Laekjarbotnar



Ulfarsardalur



30 highest hourly averages for the atmospheric concentration of hydrogen sulphide in Hveragerdi, Nordlingaholt, Laekjabotnar and Ulfarsardalur

The table shows the 30 highest hourly averages for atmospheric concentrations of hydrogen sulphide in Hveragerdi, Nordlingaholt, Laekjabotnar and Ulfarsardalur in 2023 and their timing.

Hveragerdi Finnmörk 1a		Nordlingaholt Nordlingabraut 1	
Concentration [µg/m ³]	Date & time	Concentration [µg/m ³]	Date & time
121	18.3.2023 00:00	126	24.10.2023 14:00
110	30.12.2023 05:00	123	12.1.2023 19:00
110	24.10.2023 06:00	116	12.1.2023 18:00
109	18.3.2023 02:00	111	31.12.2023 16:00
94	30.12.2023 04:00	107	12.1.2023 17:00
92	21.4.2023 06:00	93	19.1.2023 13:00
90	25.8.2023 00:00	91	23.1.2023 15:00
89	18.3.2023 01:00	87	19.1.2023 15:00
87	21.4.2023 05:00	87	30.12.2023 14:00
85	10.12.2023 05:00	86	30.10.2023 03:00
85	18.3.2023 03:00	86	29.10.2023 16:00
85	24.7.2023 05:00	85	10.12.2023 07:00
85	17.7.2023 05:00	85	27.12.2023 11:00
80	30.12.2023 03:00	85	6.1.2023 14:00
78	28.6.2023 04:00	82	7.11.2023 01:00
77	18.7.2023 03:00	80	23.1.2023 18:00
74	9.7.2023 00:00	80	17.3.2023 01:00
74	10.12.2023 06:00	79	6.1.2023 15:00
73	10.12.2023 09:00	79	27.12.2023 10:00
73	24.10.2023 01:00	79	23.1.2023 17:00
72	10.12.2023 08:00	78	28.4.2023 07:00
70	24.10.2023 08:00	77	17.3.2023 00:00
69	24.7.2023 05:00	76	31.12.2023 17:00
68	24.10.2023 07:00	74	25.12.2023 23:00
68	28.6.2023 05:00	74	31.12.2023 12:00
67	31.5.2023 20:00	74	30.10.2023 04:00
67	14.9.2023 11:00	73	26.3.2023 00:00
66	23.11.2023 12:00	73	5.1.2023 07:00
65	7.6.2023 06:00	72	27.12.2023 09:00
65	9.7.2023 01:00	71	19.1.2023 14:00

Laekjarbotnar at Waldorfskoli		Ulfarsardalur at Lambhagi	
Concentration [µg/m3]	Date & time	Concentration [µg/m3]	Date & time
88	13.1.2023 19:00	151	14.4.2023 16:00
85	27.10.2023 11:00	101	31.8.2023 07:00
79	5.12.2023 18:00	99	12.8.2023 06:00
74	6.1.2023 17:00	97	5.1.2023 09:00
74	31.12.2023 17:00	95	5.1.2023 08:00
73	5.12.2023 17:00	92	6.1.2023 11:00
73	27.12.2023 10:00	80	6.1.2023 15:00
68	27.12.2023 11:00	78	6.1.2023 06:00
68	29.4.2023 08:00	76	6.1.2023 07:00
64	30.10.2023 22:00	76	31.8.2023 07:00
64	24.10.2023 23:00	75	6.1.2023 10:00
63	24.10.2023 14:00	68	6.1.2023 05:00
62	27.12.2023 09:00	67	5.1.2023 10:00
62	27.12.2023 08:00	65	19.1.2023 18:00
61	25.10.2023 02:00	64	6.1.2023 08:00
61	31.10.2023 05:00	59	6.1.2023 09:00
60	27.12.2023 07:00	58	6.1.2023 16:00
60	13.1.2023 20:00	55	1.2.2023 05:00
59	27.10.2023 10:00	55	6.1.2023 03:00
59	23.1.2023 15:00	54	19.1.2023 19:00
58	8.7.2023 00:00	53	6.1.2023 04:00
58	6.1.2023 18:00	52	23.8.2023 08:00
57	8.7.2023 01:00	52	17.3.2023 06:00
57	3.12.2023 12:00	50	17.3.2023 05:00
57	23.1.2023 14:00	50	12.8.2023 08:00
56	24.10.2023 15:00	50	13.1.2023 07:00
55	9.8.2023 08:00	50	26.4.2023 05:00
53	22.9.2023 11:00	50	25.6.2023 08:00
53	31.10.2023 02:00	48	12.8.2023 09:00
52	28.12.2023 14:00	47	14.6.2023 07:00

Comparison between regulatory limits of hydrogen sulphide in $\mu\text{g}/\text{m}^3$ and ppm

According to the regulation no. 514/2010 regarding the Concentration of Hydrogen Sulphide in the Atmosphere, environmental limits are set at $50 \mu\text{g}/\text{m}^3$, based on the maximum daily running 24-hour average. The concentrations may exceed those limits three times per annum. Other environmental limits are that the maximum annual average shall be $5 \mu\text{g}/\text{m}^3$ and the environmental authorities shall be notified when the concentration measured exceeds $150 \mu\text{g}/\text{m}^3$ for three consecutive hours. Regulation no. 514/2010 does not apply to the industrial areas of the Hellisheidi and Nesjavellir geothermal power plants. There Regulation no. 390/2009 on Pollution Limits and Methods to Reduce Pollution in Workplaces applies. The pollution limit in a work environment is $7,000 \mu\text{g}/\text{m}^3$ and depends on the average of an eight-hour workday, and $14,000 \mu\text{g}/\text{m}^3$ when based on the average over a 15-minute period.

$\mu\text{g}/\text{m}^3$	ppm	Comments
5	0.0039	Maximum annual average
7-15	0.0054 - 0,012	Odour threshold
50	0.039	Maximum daily average
150	0.12	Notification limits (three continuous hours)
7,000	5.41	Limit in a work environment for an eight-hour workday
14,000	10.8	Limit in a work environment for a fifteen-minute period
>14,000	>10.8	Irritation in airway, sense of smell fades and other symptoms. GET OUT OF THE SITUATION.