

OR Annual report 2020

Appendices



Atmospheric concentrations of H₂S in populated areas and regulatory limits



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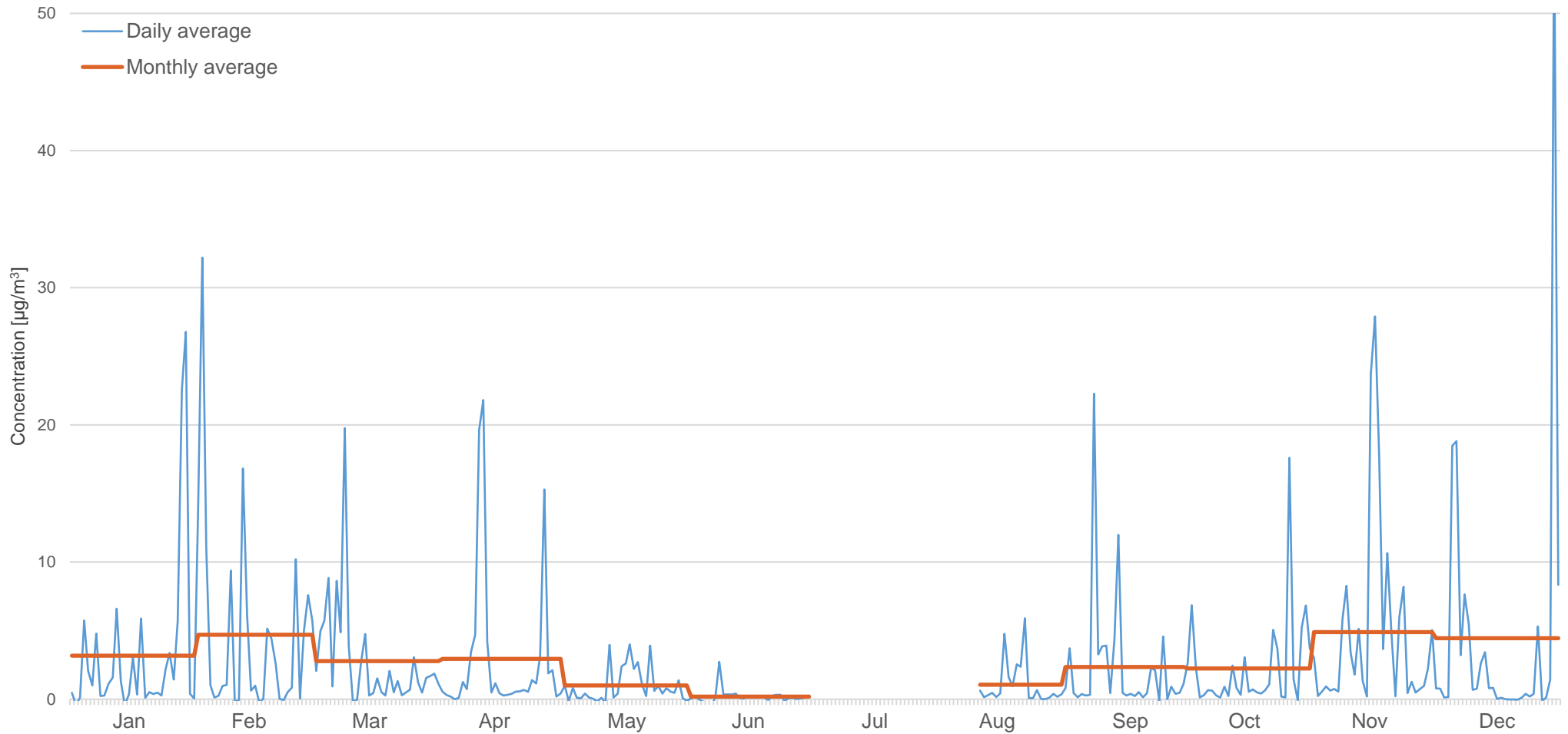
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Cover photo: Gretar Ívarsson

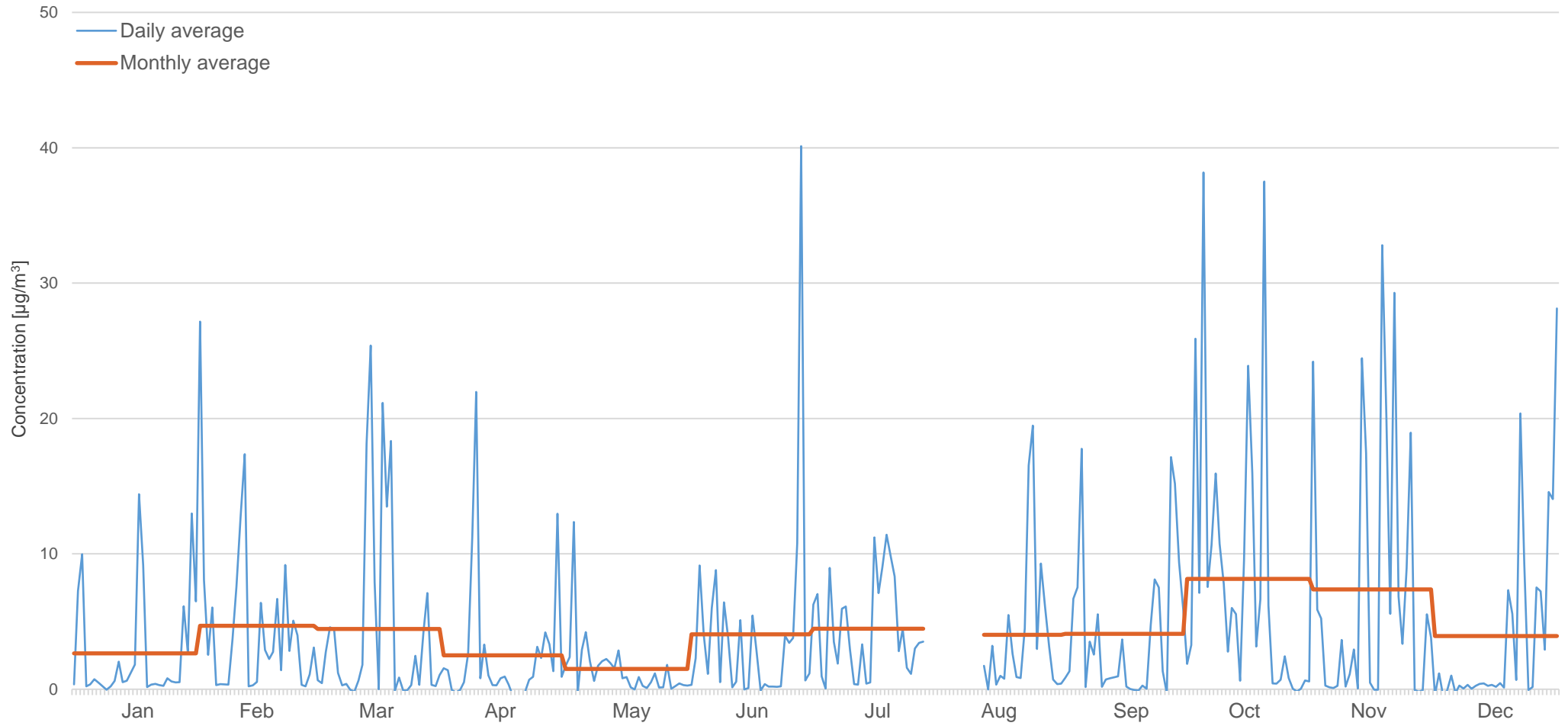
Atmospheric concentration of hydrogen sulphide (H₂S) in Nordlingaholt, Hveragerdi, Laekjarbotnar and Ulfarsardalur 2020

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

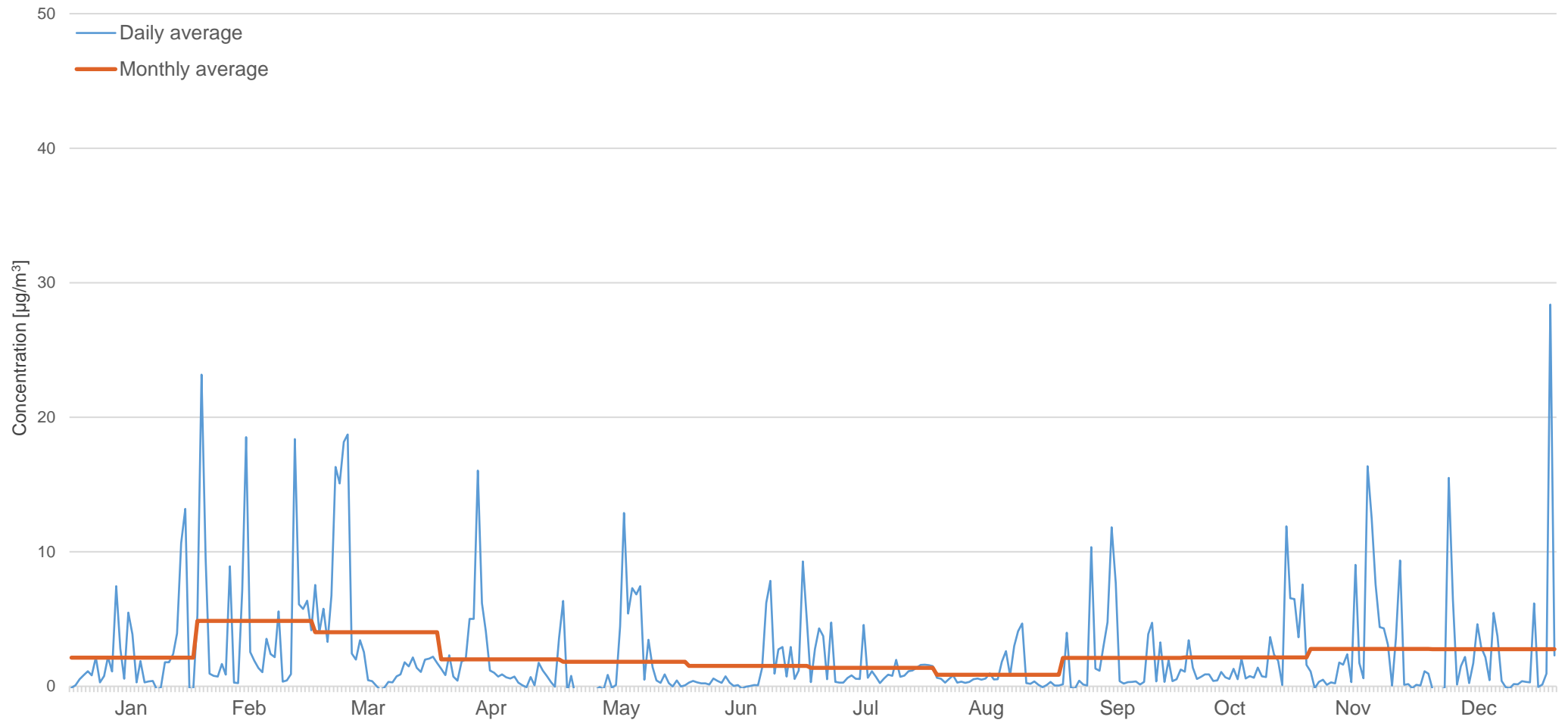
Nordlingaholt



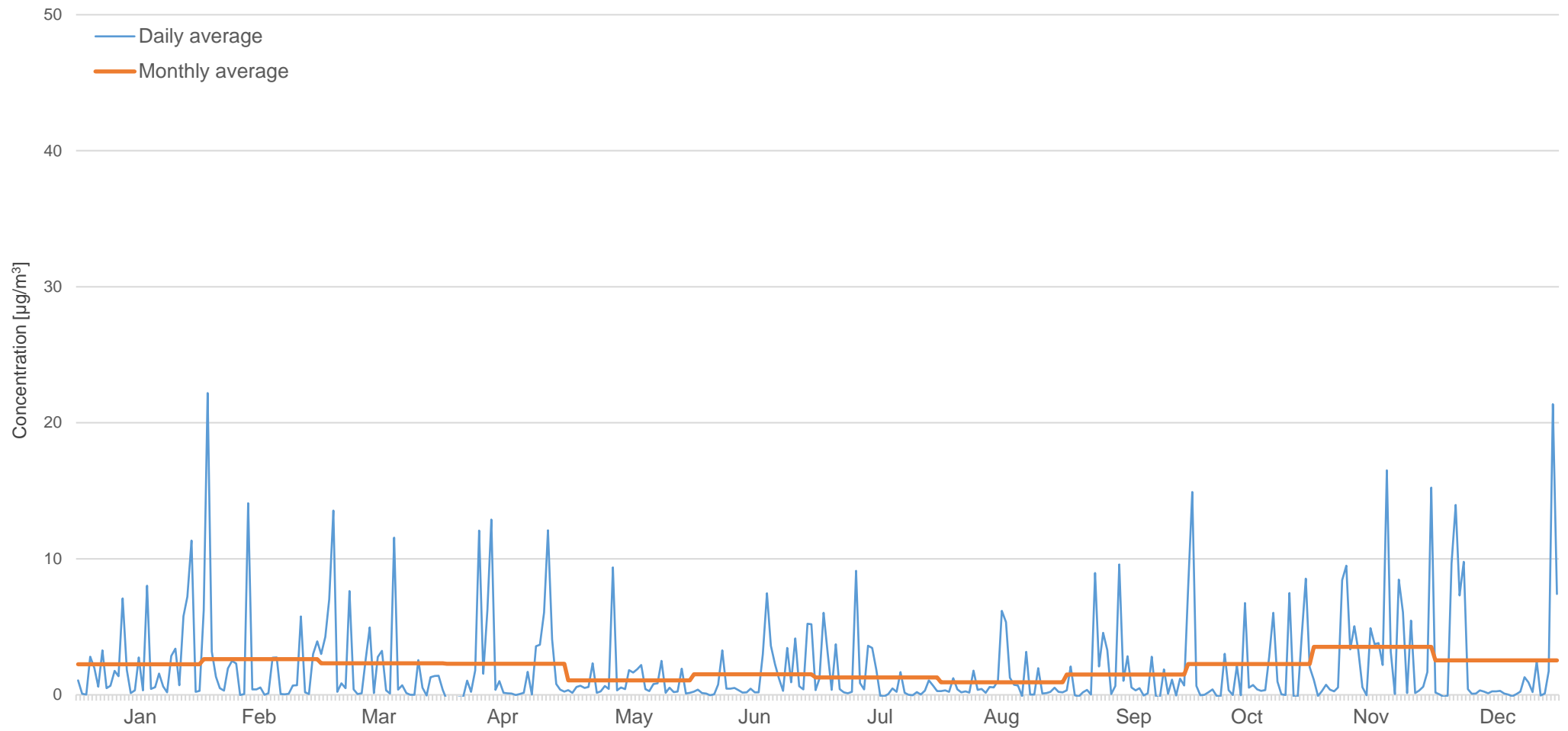
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Laekjarbotnar



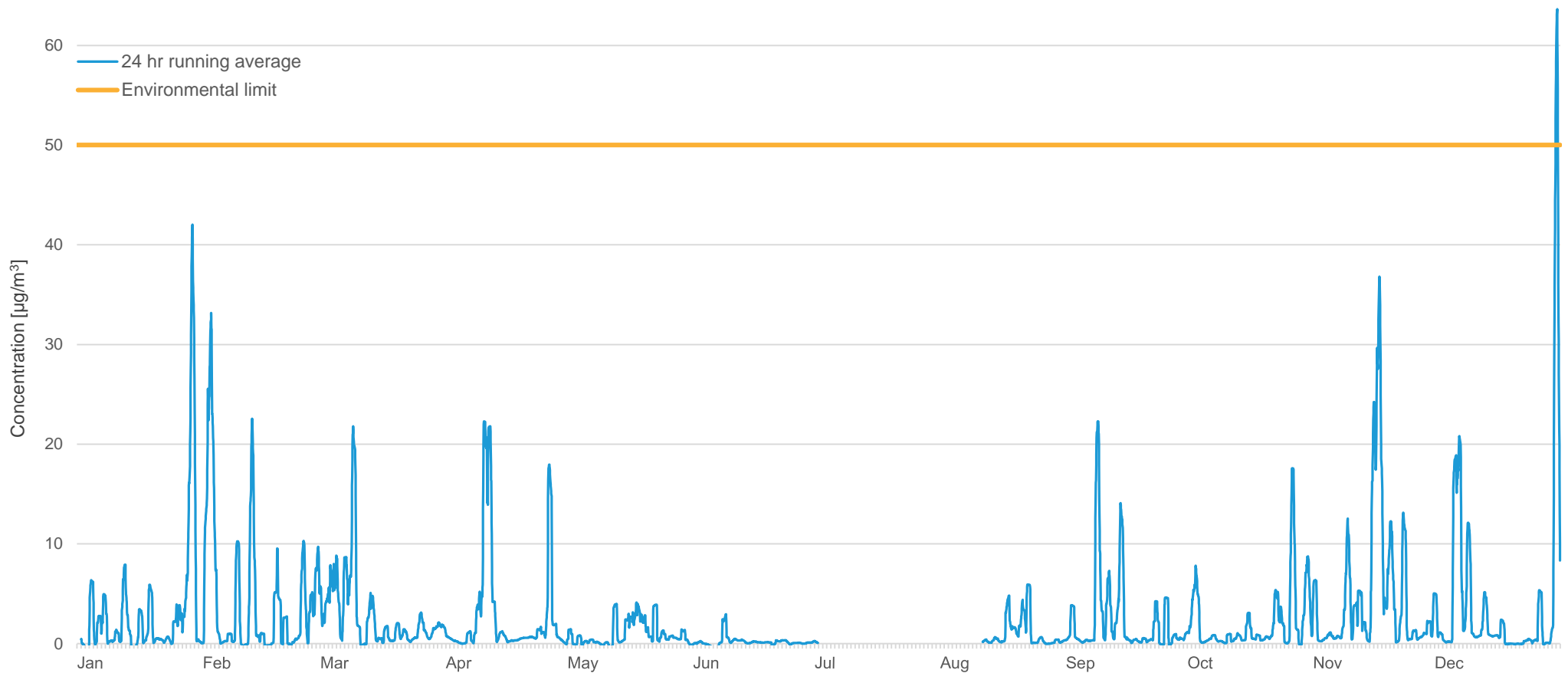
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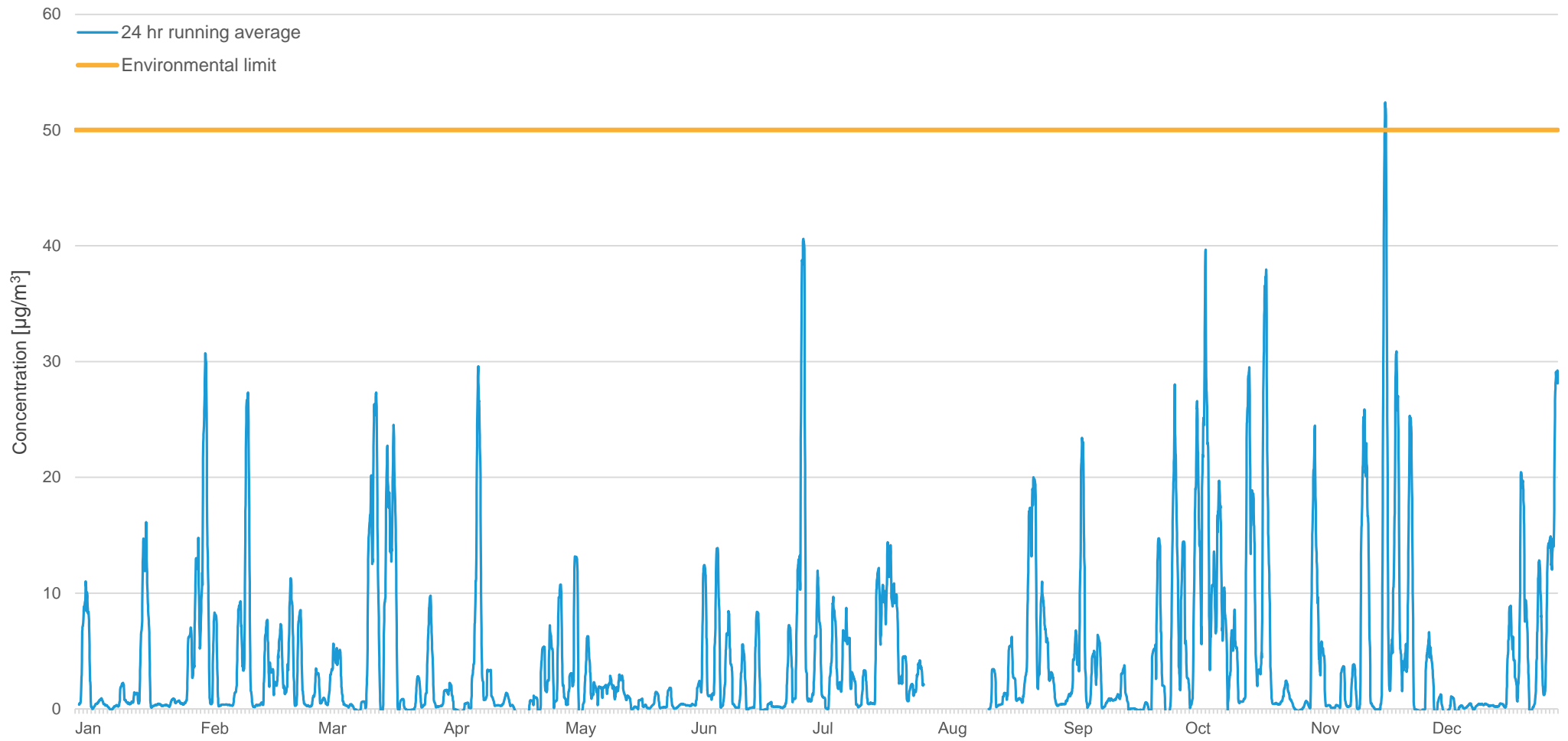
Atmospheric concentration of hydrogen sulphide (H₂S) in Nordlingaholt, Hveragerdi, Laekjarbotnar and Ulfarsardalur 2020

In 2020 the atmospheric concentrations of hydrogen sulphide (H₂S) did not exceed environmental limits in Laekjarbotnar and Ulfarsardalur but did exceed the limits once in both Nordlingaholt and Hveragerdi. Capture and reinjection of hydrogen sulphide from Hellisheidi power plant was successful in 2020 and about 60% of all hydrogen sulphide produced at Hellisheidi was reinjected. The total amount of hydrogen sulphide emitted by the Nesjavellir and Hellisheidi power plants was 11.7 thousand tonnes in 2020.

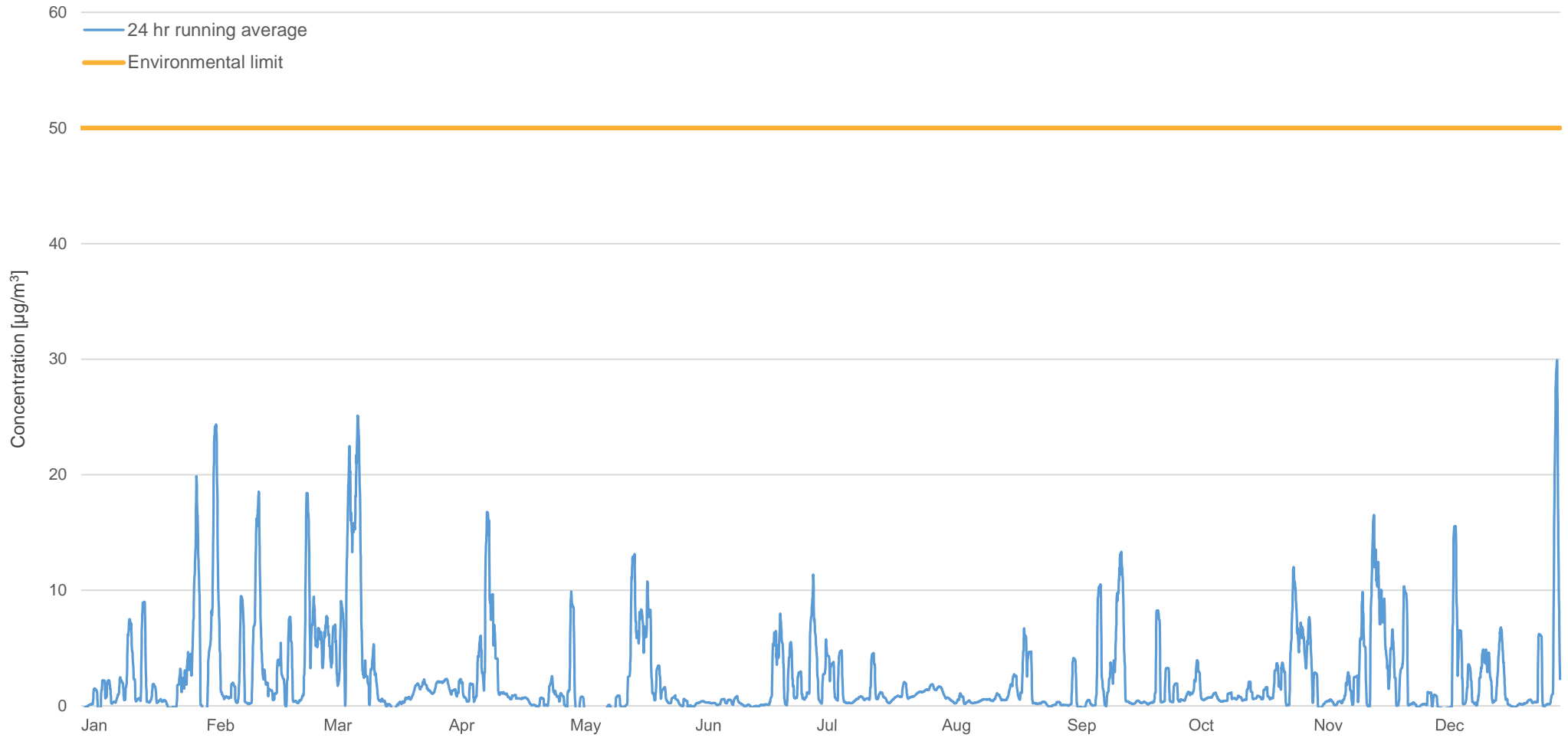
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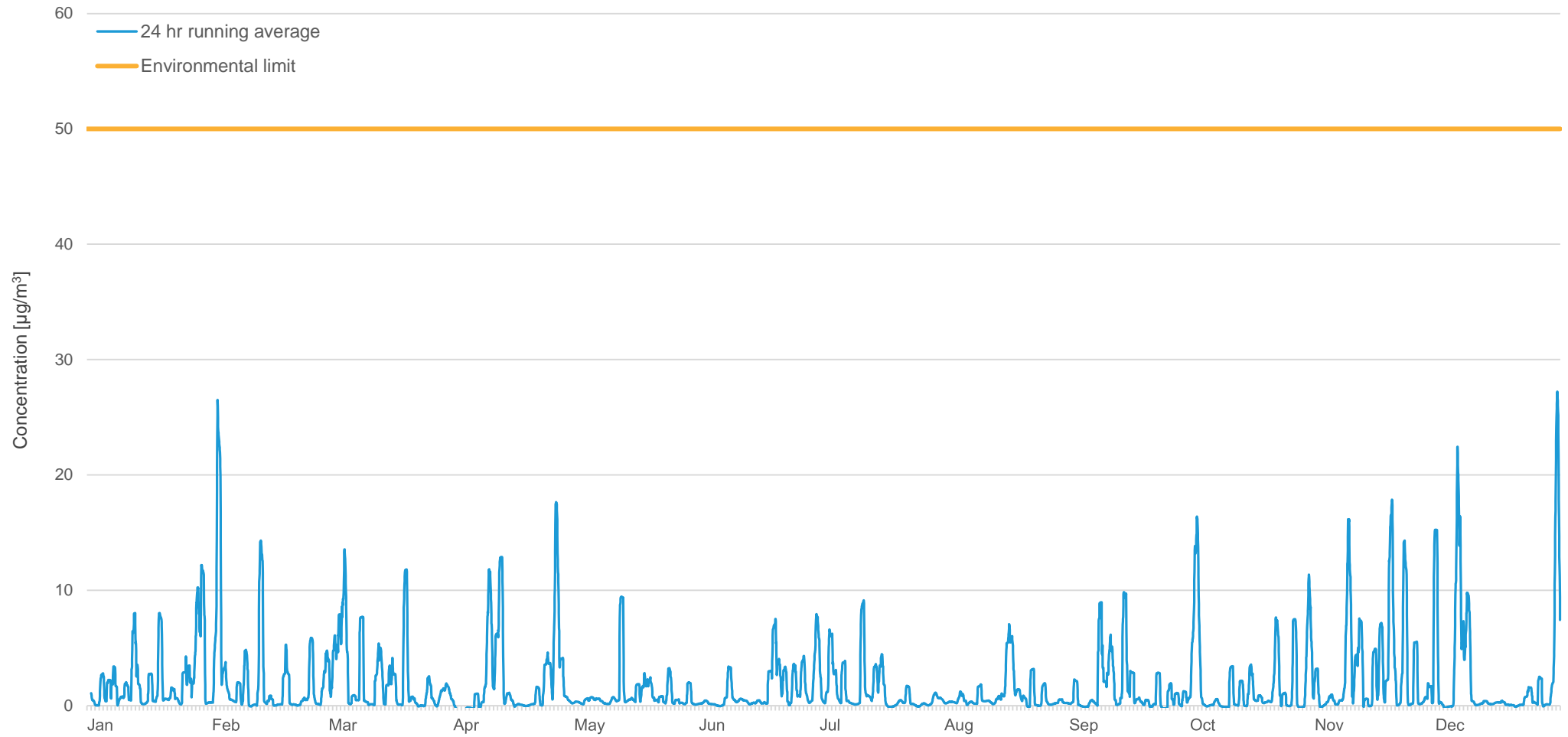
Hveragerdi



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, Laekjarbotnar and Ulfarsardalur in 2020 and their timing.

Hveragerdi Finnmork 1a		Nordlingaholt Nordlingabraut 1	
Concentration [µg/m3]	Date & time	Concentration [µg/m3]	Date & time
227	28.6.2020 02:00	140	30.12.2020 12:00
149	5.10.2020 03:00	125	6.12.2020 14:00
138	28.6.2020 08:00	125	10.4.2020 04:00
138	5.9.2020 06:00	123	26.4.2020 05:00
134	19.11.2020 00:00	122	30.12.2020 11:00
127	20.10.2020 03:00	114	26.4.2020 04:00
120	18.11.2020 18:00	113	30.12.2020 21:00
111	29.9.2020 22:00	109	30.12.2020 13:00
107	13.11.2020 08:00	103	8.9.2020 06:00
104	15.10.2020 23:00	103	30.12.2020 10:00
102	28.6.2020 01:00	95	16.11.2020 17:00
100	16.10.2020 03:00	94	30.12.2020 14:00
95	18.11.2020 20:00	93	2.2.2020 06:00
94	20.10.2020 02:00	91	11.4.2020 09:00
92	27.9.2020 12:00	91	10.4.2020 06:00
91	18.11.2020 19:00	85	29.1.2020 00:00
90	23.9.2020 21:00	84	15.11.2020 10:00
90	3.5.2020 03:00	82	11.4.2020 06:00
87	1.2.2020 13:00	80	8.3.2020 20:00
86	18.11.2020 15:00	80	30.12.2020 16:00
84	1.2.2020 12:00	77	30.12.2020 09:00
83	21.11.2020 20:00	75	30.12.2020 07:00
83	5.10.2020 22:00	75	8.3.2020 19:00
83	9.4.2020 02:00	72	13.2.2020 00:00
82	16.10.2020 04:00	71	5.12.2020 15:00
81	28.6.2020 06:00	70	30.12.2020 18:00
79	13.11.2020 09:00	69	30.12.2020 22:00
78	21.11.2020 21:00	68	16.11.2020 18:00
78	28.6.2020 05:00	68	6.12.2020 12:00
78	12.2.2020 01:00	68	30.12.2020 17:00

Laekjarbotnar at Waldorfskoli		Ulfarsardalur at Lambhagi	
Concentration [µg/m3]	Date & time	Concentration [µg/m3]	Date & time
107	10.4.2020 00:00	105	2.2.2020 06:00
91	30.12.2020 11:00	91	12.2.2020 17:00
79	30.12.2020 09:00	88	30.11.2020 13:00
68	10.4.2020 23:00	79	2.2.2020 04:00
66	5.12.2020 15:00	78	19.11.2020 10:00
62	6.3.2020 15:00	71	2.2.2020 08:00
61	2.2.2020 18:00	69	30.12.2020 15:00
60	15.11.2020 00:00	68	14.9.2020 05:00
57	30.12.2020 07:00	68	26.10.2020 14:00
56	25.2.2020 12:00	67	29.1.2020 07:00
56	10.4.2020 01:00	67	12.5.2020 06:00
55	20.5.2020 01:00	60	12.5.2020 07:00
55	9.3.2020 03:00	60	12.2.2020 18:00
54	2.2.2020 19:00	60	2.2.2020 07:00
54	23.11.2020 05:00	60	26.4.2020 08:00
53	5.12.2020 07:00	60	8.9.2020 02:00
53	22.9.2020 23:00	59	2.2.2020 05:00
52	9.4.2020 23:00	58	29.1.2020 01:00
52	29.1.2020 10:00	57	8.3.2020 16:00
52	29.1.2020 11:00	55	30.11.2020 15:00
52	29.1.2020 12:00	54	12.4.2020 09:00
51	25.2.2020 14:00	54	19.11.2020 11:00
51	30.12.2020 20:00	53	30.11.2020 14:00
51	5.12.2020 08:00	52	8.3.2020 17:00
48	8.9.2020 10:00	50	30.12.2020 14:00
48	2.2.2020 15:00	49	6.12.2020 08:00
48	15.11.2020 01:00	49	8.9.2020 08:00
46	9.3.2020 01:00	48	12.4.2020 08:00
46	6.3.2020 16:00	48	30.12.2020 23:00
45	30.12.2020 10:00	48	19.3.2020 13:00

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.