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PART 2/38

COMMISSION STAFF WORKING DOCUMENT

Accompanying the document

REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

**on the implementation of Council Directive 91/676/EEC concerning the protection of
waters against pollution caused by nitrates from agricultural sources based on Member
State reports for the period 2016–2019**

{COM(2021) 1000 final}

2. WATER QUALITY

Monitoring

Table 1: Number of stations and station density (stations per 1 000 km² of land) of reported groundwater monitoring of annual average nitrate measurements in reporting periods 2008-2011, 2012-2015 and 2016-2019, the change (%) between the last two periods, and the annual average sampling frequency in 2016-2019.

MS	Area km ²	Number of Stations			Stations per 1000 km ²			Change	Sampling per year
		2008-2011	2012-2015	2016-2019	2008-2011	2012-2015	2016-2019	(%)	2016-2019
AT	83944	1965	1965	1933	23.4	23.4	23.0	-1.6	1.8
BE	30667	2974	2937	2905	97.0	95.8	94.7	-1.1	4.4
BG	110995	426	406	488	3.8	3.7	4.4	20.2	5.7
CY	9249	244	230	241	26.4	24.9	26.1	4.8	1.8
CZ	78874	611	621	657	7.7	7.9	8.3	5.8	1.9
DE	357746	162	697	692	0.5	1.9	1.9	-0.7	0.7
DK	43162	595	1201	1275	13.8	27.8	29.5	6.2	0.8
EE	45347	297	385	369	6.5	8.5	8.1	-4.2	1.4
EL	131692	370	1078	1764	2.8	8.2	13.4	63.6	0.8
ES	505983	4778	4132	4157	9.4	8.2	8.2	0.6	1.7
FI	337547	79	187	193	0.2	0.6	0.6	3.2	1.4
FR	638474	2509	2598	2582	3.9	4.1	4.0	-0.6	1.1
HR	56539	NA	126	132	NA	2.2	2.3	4.8	6.6
HU	93013	1763	1756	1788	19.0	18.9	19.2	1.8	1.7
IE	69946	211	205	200	3.0	2.9	2.9	-2.4	2.9
IT	300578	5070	5035	4618	16.9	16.8	15.4	-8.3	1.7
LT	64899	62	65	60	1.0	1.0	0.9	-7.7	0.9
LU	2595	20	20	20	7.7	7.7	7.7	0.0	3.0
LV	64586	173	199	232	2.7	3.1	3.6	16.6	1.4
MT	315	41	41	44	130.2	130.2	139.7	7.3	1.8
NL	37368	1297	1318	1217	34.7	35.3	32.6	-7.7	1.4
PL	311928	1258	1563	1421	4.0	5.0	4.6	-9.1	0.7
PT	91971	657	580	520	7.1	6.3	5.7	-10.3	1.6
RO	238368	1809	1256	1384	7.6	5.3	5.8	10.2	1.7
SE	449718	326	436	533	0.7	1.0	1.2	22.2	0.7
SI	20277	104	198	211	5.1	9.8	10.4	6.6	1.8
SK	49026	1717	1717	1788	35.0	35.0	36.5	4.1	1.7
UK	244574	3088	3139	2955	12.6	12.8	12.1	-5.9	3.8
EU27+UK	4469381	32606	34091	34379	7.3	7.6	7.7	0.8	2.0

(*) NA: not available

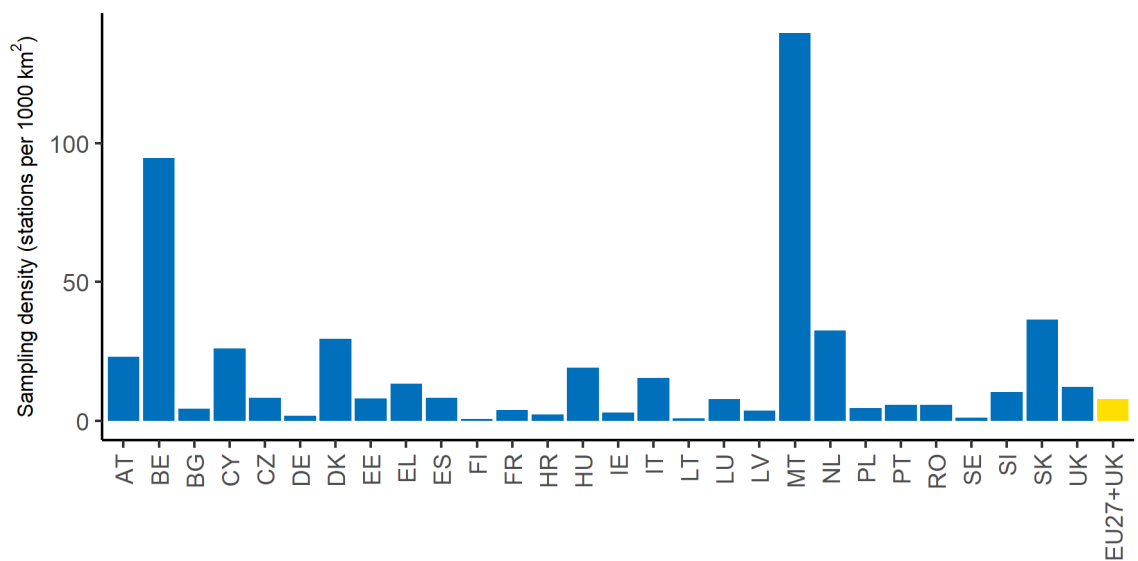


Figure 1: Groundwater station density (stations per 1 000 km² of land) in reporting period 2016-2019. Stations with data of average annual nitrate measurements.

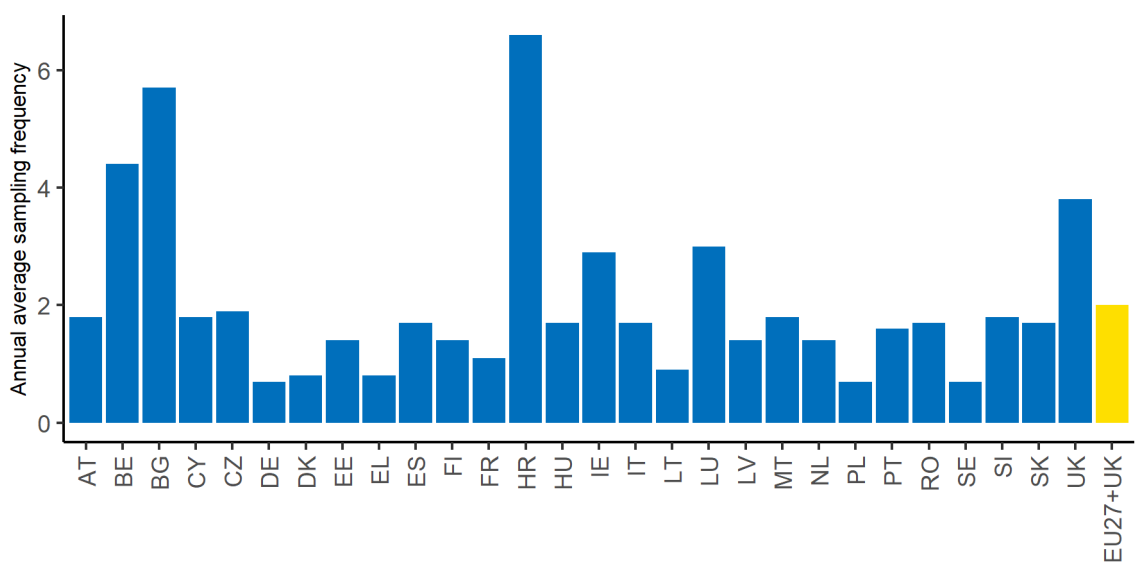


Figure 2: Average annual groundwater sampling frequency in reporting period 2016-2019. Stations with data of average annual nitrate measurements.

Table 2: Number of stations and station density (stations per 1 000 km² of land) of reported fresh surface water monitoring of annual average nitrate measurements in reporting periods 2008-2011, 2012-2015 and 2016-2019, the change (%) between the last two periods, and the annual average sampling frequency in 2016 -2019.

MS	Area km ²	Number of Stations			Stations per 1000 km ²			Change (%)	Sampling per year 2016-2019
		2008-2011	2012-2015	2016-2019	2008-2011	2012-2015	2016-2019		
AT	83944	109	108	128	1.3	1.3	1.5	18.5	10.9
BE	30667	857	835	819	27.9	27.2	26.7	-1.9	7.0
BG	110995	305	318	320	2.7	2.9	2.9	0.6	5.6
CY	9249	10	13	13	1.1	1.4	1.4	0.0	8.5
CZ	78874	571	1917	2086	7.2	24.3	26.4	8.8	7.9
DE	357746	303	241	309	0.8	0.7	0.9	28.2	10.5
DK	43162	161	177	445	3.7	4.1	10.3	151.4	15.0
EE	45347	145	324	280	3.2	7.1	6.2	-13.6	2.8
EL	131692	105	479	284	0.8	3.6	2.2	-40.7	1.2
ES	505983	3730	3903	3525	7.4	7.7	7.0	-9.7	3.6
FI	337547	141	167	147	0.4	0.5	0.4	-12.0	6.2
FR	638474	3331	3390	3251	5.2	5.3	5.1	-4.1	2.4
HR	56539	NA	64	75	NA	1.1	1.3	17.2	9.9
HU	93013	525	530	927	5.6	5.7	10.0	74.9	5.0
IE	69946	252	254	254	3.6	3.6	3.6	0.0	14.5
IT	300578	2463	3154	2288	8.2	10.5	7.6	-27.5	4.8
LT	64899	291	320	289	4.5	4.9	4.5	-9.7	3.4
LU	2595	16	16	16	6.2	6.2	6.2	0.0	6.4
LV	64586	338	222	435	5.2	3.4	6.7	95.9	2.1
MT	315	7	5	NA	22.2	15.9	NA	NA	NA
NL	37368	457	850	852	12.2	22.7	22.8	0.2	13.7
PL	311928	2802	2526	3935	9.0	8.1	12.6	55.8	3.0
PT	91971	146	154	158	1.6	1.7	1.7	2.6	4.4
RO	238368	1113	1224	1123	4.7	5.1	4.7	-8.3	6.0
SE	449718	187	2792	2282	0.4	6.2	5.1	-18.3	1.0
SI	20277	139	136	154	6.9	6.7	7.6	13.2	3.5
SK	49026	852	512	842	17.4	10.4	17.2	64.5	4.6
UK	244574	7378	8404	7947	30.2	34.4	32.5	-5.4	5.6
EU27+UK	4469381	26734	33035	33184	6.0	7.4	7.4	0.5	6.3

(*) NA: not available

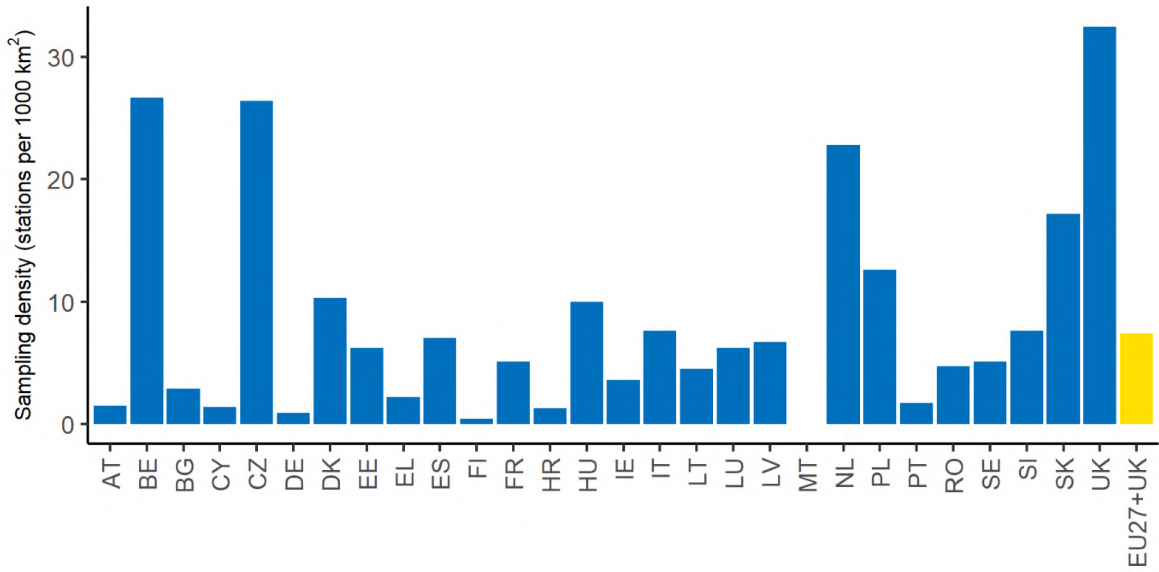


Figure 3: Fresh surface water station density (stations per 1 000 km² of land) in reporting period 2016-2019. Stations with data of average annual nitrate measurements.

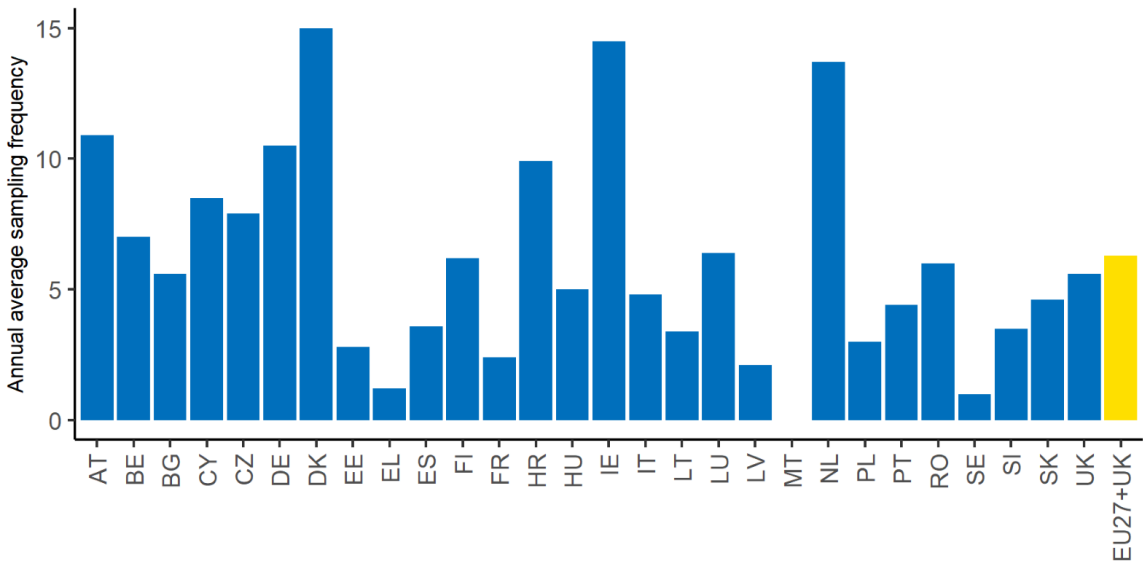


Figure 4: Annual average fresh surface water sampling frequency in reporting period 2016-2019. Stations with data of average annual nitrate measurements.

Table 3: Number of stations of reported saline surface water monitoring of annual average nitrate measurements in reporting periods 2008-2011, 2012-2015 and 2016-2019, and the change (%) between the last two periods.

MS	Number of Stations			Change (%)	Sampling per year 2016-2019
	2008-2011	2012-2015	2016-2019		
AT	NA	NA	NA	NA	NA
BE	10	10	3	-70.0	6.7
BG	7	6	6	0.0	1.8
CY	0	16	16	0.0	2.0
CZ	NA	NA	NA	NA	NA
DE	5	5	51	920.0	5.9
DK	70	44	66	50.0	15.6
EE	23	26	21	-19.2	9.0
EL	11	NA	81	NA	1.1
ES	631	250	594	137.6	2.6
FI	44	75	76	1.3	4.5
FR	21	8	23	187.5	0.7
HR	NA	NA	11	NA	4.5
HU	NA	NA	NA	NA	NA
IE	124	117	122	4.3	3.4
IT	584	577	503	-12.8	5.1
LT	17	16	16	0.0	8.8
LU	NA	NA	NA	NA	NA
LV	45	43	16	-62.8	1.2
MT	31	49	62	26.5	1.4
NL	43	39	34	-12.8	11.7
PL	46	19	19	0.0	28.3
PT	55	6	20	233.3	2.8
RO	54	35	32	-8.6	3.2
SE	233	184	190	3.3	4.5
SI	5	5	5	0.0	12.0
SK	NA	NA	NA	NA	NA
UK	1064	674	586	-13.1	5.4
EU27+UK	3123	2204	2553	15.8	6.2

(*) NA: not available

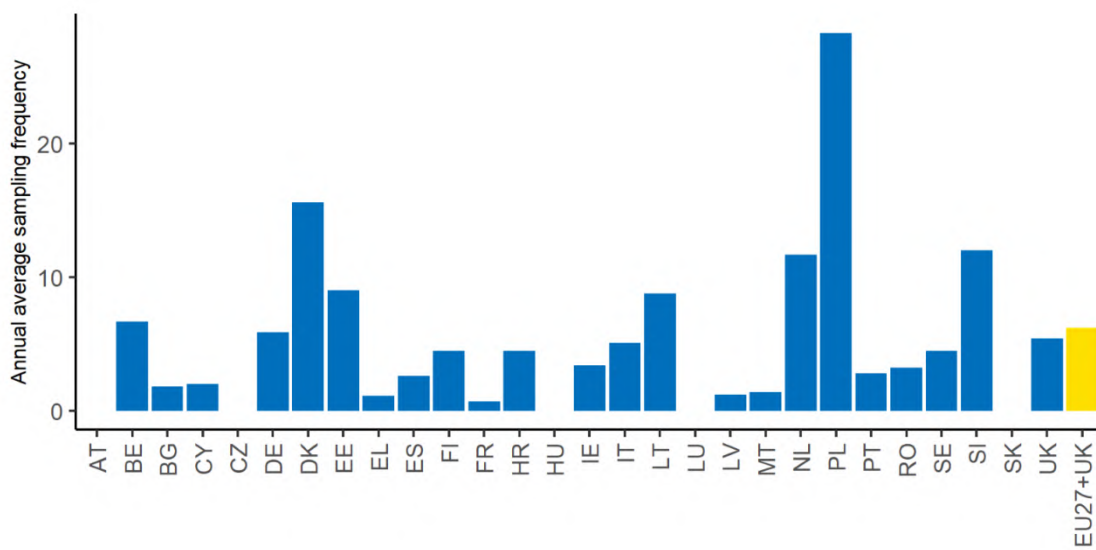


Figure 5: Annual average saline surface water sampling frequency in reporting period 2016-2019. Stations with data of average annual nitrate measurements.

Table 4: Number of stations with trends for groundwater monitoring points in the periods 2008-2011, 2012-2015 and 2016-2019.

MS	Stations with trends (#)		
	2008-2011	2012-2015	2016-2019
AT	1724	1906	1837
BE	2883	2836	2884
BG	115	359	368
CY	221	210	191
CZ	323	607	657
DE	162	692	689
DK	589	1001	1105
EE	45	108	332
EL	369	0	0
ES	2315	3035	3893
FI	52	187	193
FR	1039	2094	2360
HR	0	0	123
HU	1720	1736	1710
IE	204	205	200
IT	4193	4134	3431
LT	62	65	60
LU	19	20	20
LV	140	163	184
MT	0	41	41
NL	1253	1229	1160
PL	1125	1063	1304
PT	586	553	519
RO	929	849	1114
SE	0	99	109
SI	104	98	192
SK	681	1544	1298
UK	2323	2654	2749
EU27+UK	23176	27488	28723

(*) stations with trends between periods can be different

Table 5: Number of stations with trends for surface water monitoring points in the periods 2008-2011, 2012-2015 and 2016-2019.

MS	Stations with trends (#)		
	2008-2011	2012-2015	2016-2019
AT	100	107	102
BE	856	830	815
BG	89	292	318
CY	28	26	29
CZ	554	502	1796
DE	0	0	298
DK	125	182	285
EE	74	138	152
EL	115	0	0
ES	2343	3289	3797
FI	183	240	155
FR	1202	2900	3025
HR	0	0	64
HU	212	313	414
IE	332	349	362
IT	2216	2450	2391
LT	83	233	222
LU	16	16	16
LV	189	199	180
MT	0	0	22
NL	269	204	808
PL	1607	1663	2199
PT	111	145	156
RO	930	962	996
SE	0	45	33
SI	114	121	140
SK	236	378	343
UK	6660	6099	7605
EU27+UK	18644	21683	26723

(*) stations with trends between periods can be different

Groundwater quality

Table 6: Percentage of groundwater monitoring points per water quality class (annual average nitrate concentration in mg nitrate per l) for all stations of the EU 27 Member States and UK for the period 2016-2019.

MS	2016 - 2019			
	<25	[25,40)	[40,50)	≥ 50
AT	76.7	10.7	5.5	7.2
BE	61.5	15.2	7.3	16.0
BG	62.1	18.0	5.3	14.5
CY	71.4	7.9	3.7	17.0
CZ	76.1	7.6	4.6	11.7
DE	49.6	14.0	9.7	26.7
DK	68.3	10.7	6.7	14.3
EE	77.8	12.5	6.8	3.0
EL	75.8	8.9	3.4	11.9
ES	57.7	12.9	6.3	23.1
FI	93.3	3.6	1.6	1.6
FR	49.3	25.1	12.8	12.8
HR	87.9	9.8	0.8	1.5
HU	86.9	4.0	1.9	7.3
IE	81.5	16.0	1.0	1.5
IT	68.1	13.7	5.6	12.5
LT	95.0	1.7	1.7	1.7
LU	40.0	25.0	15.0	20.0
LV	96.6	1.7	0.4	1.3
MT	4.5	18.2	13.6	63.6
NL	73.3	7.6	5.2	14.0
PL	87.1	5.8	2.4	4.6
PT	67.1	11.2	4.2	17.5
RO	75.3	8.7	3.5	12.6
SE	95.3	2.8	0.9	0.9
SI	73.9	10.9	6.2	9.0
SK	74.9	8.8	4.3	12.0
UK	61.5	19.1	7.2	12.2
EU27+UK	67.4	12.7	5.8	14.1

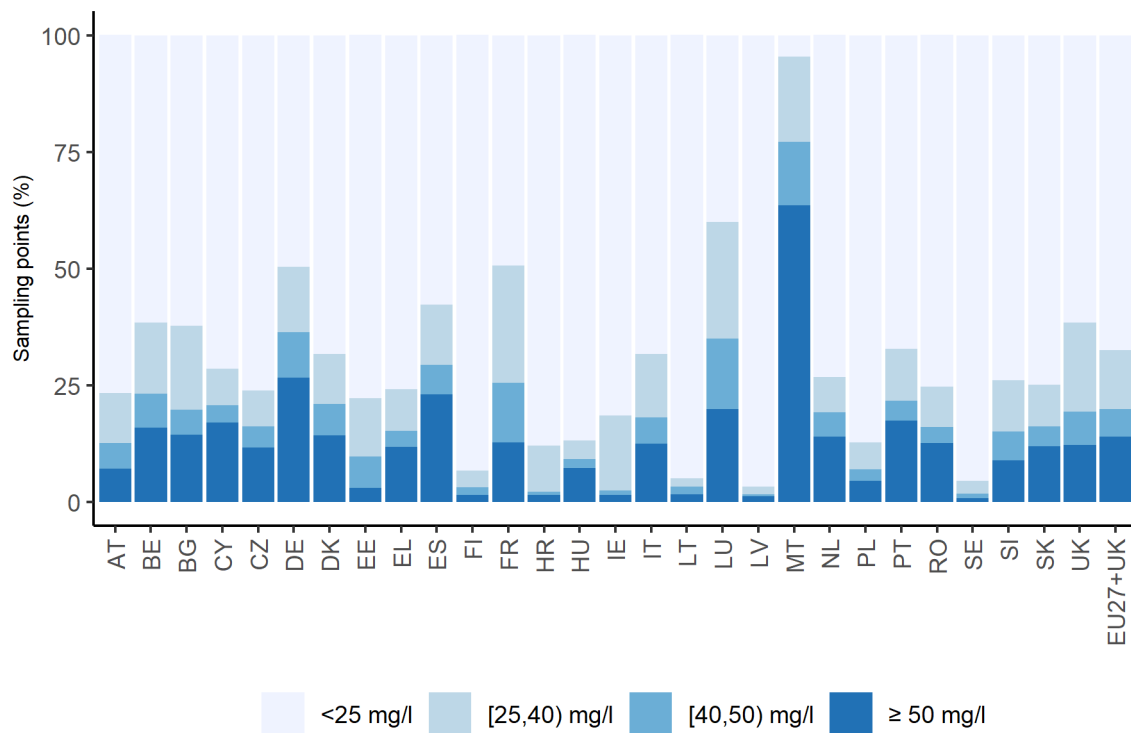


Figure 6: Frequency diagram of annual average nitrate concentrations in groundwater, at all depths, in reporting period 2016-2019.

Table 7: Percentage of groundwater stations (at all depth) with decreasing, stable or increasing trends in average groundwater nitrate concentrations between the reporting periods 2012-2015 and 2016-2019.

MS	2016 - 2019				
	< -5	[-5,1)	[1,-1]	(1,5]	>5
AT	11.3	21.4	48.8	13.6	5.0
BE	16.6	16.9	36.9	15.0	14.5
BG	23.4	16.3	20.1	19.3	20.9
CY	12.0	12.0	44.5	14.1	17.3
CZ	9.1	11.3	63.5	9.7	6.4
DE	18.3	18.4	39.8	12.0	11.5
DK	18.9	12.4	50.4	7.6	10.7
EE	6.9	9.3	60.8	9.6	13.3
EL	NA	NA	NA	NA	NA
ES	18.7	17.0	33.4	15.9	15.0
FI	4.7	12.4	57.5	14.5	10.9
FR	12.6	19.8	34.8	21.5	11.4
HR	19.5	45.5	30.9	4.1	0.0
HU	5.8	9.8	68.7	8.7	7.0
IE	2.0	15.0	45.5	30.0	7.5
IT	17.7	20.2	39.4	13.8	8.9
LT	8.3	18.3	50.0	10.0	13.3
LU	5.0	25.0	45.0	15.0	10.0
LV	2.7	3.8	87.0	2.7	3.8
MT	41.5	26.8	12.2	12.2	7.3
NL	15.4	6.8	59.1	5.7	12.9
PL	6.0	10.2	70.4	8.0	5.4
PT	14.1	14.8	41.4	16.6	13.1
RO	18.5	14.9	32.0	15.4	19.2
SE	0.0	0.9	97.2	1.8	0.0
SI	9.9	21.4	51.6	14.1	3.1
SK	17.5	14.0	38.9	16.7	12.9
UK	9.2	19.9	48.1	15.0	7.8
EU27+UK	14.1	16.3	44.8	13.9	10.9

(*) NA: not available

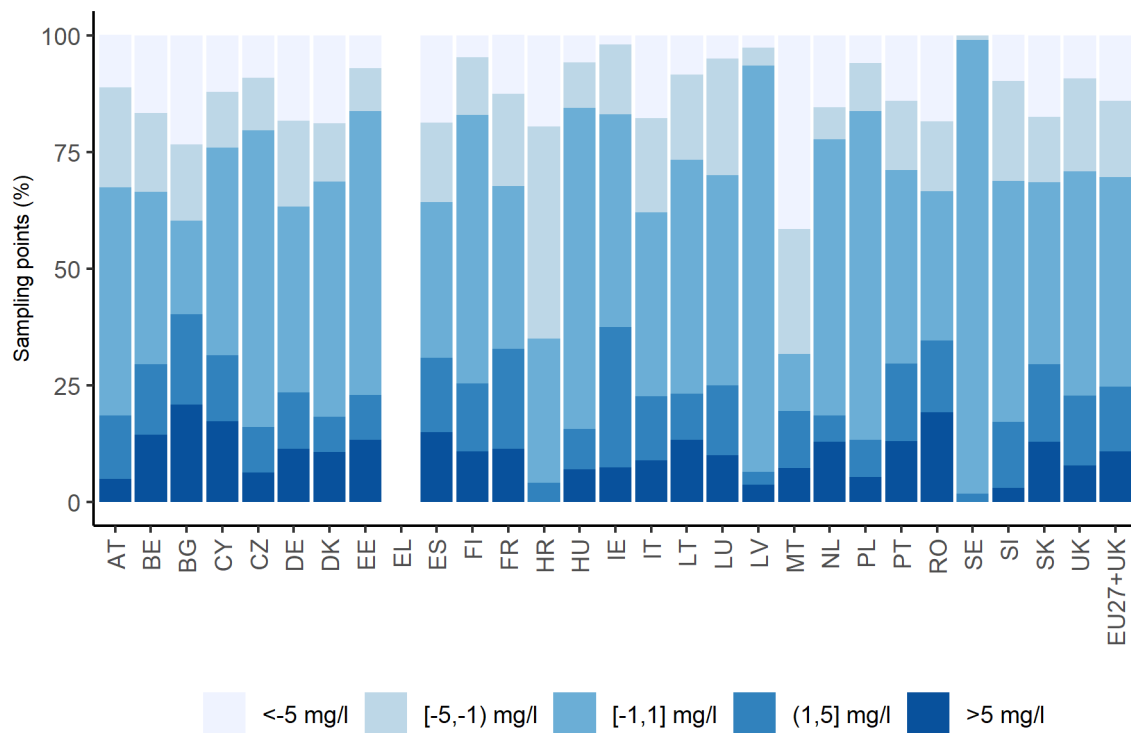


Figure 7: Frequency diagram of trends in annual average nitrate concentrations in groundwater, at all depths, in reporting period 2016-2019.

Table 26: Percentage of groundwater stations by classes of annual nitrate concentration, at different sampling depths, aggregated over all Member States. Reporting period 2016-2019.

Depth	Total stations		Percentage of stations			
	#	%	<25 mg/l	[25,40) mg/l	[40,50) mg/l	≥ 50 mg/l
Phreatic groundwater (shallow): 0-5m	9384	27.3	68.6	12.0	5.8	13.5
Phreatic groundwater (deep): 5-15m	7160	20.8	63.2	12.5	6.4	17.8
Phreatic groundwater (deep): 15-30m	4684	13.6	60.4	14.7	7.9	17.1
Phreatic groundwater (deep): >30m	5511	16.0	62.7	16.9	6.8	13.5
Captive groundwater	4258	12.4	87.2	6.2	2.6	4.0
Karstic groundwater	2618	7.6	80.4	11.2	3.3	5.1
Not indicated	764	2.2	61.6	15.1	6.7	16.6

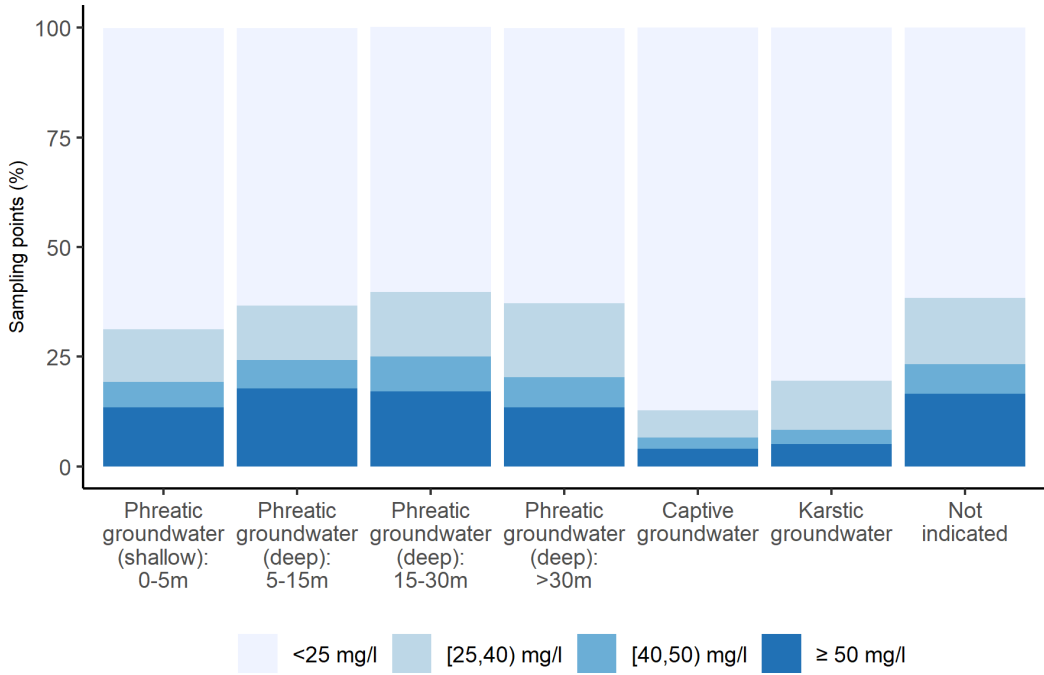


Figure 8: Frequency diagram of annual average nitrate concentrations in groundwater at different depths, aggregated over all Member States. Reporting period 2016-2019

Table 8: Percentage of groundwater stations with decreasing, stable or increasing trends at different depths, aggregated over all Member States. Reporting period 2016-2019

Depth	Total stations		Percentage of stations				
	#	%	< -5 mg/l	[-5,-1] mg/l	[-1,1] mg/l	(1,5] mg/l	>5 mg/l
Phreatic groundwater (shallow): 0-5m	8500	29.6	14.6	17.6	40.3	15.2	12.3
Phreatic groundwater (deep): 5-15m	6069	21.1	20.6	15.9	35.0	13.9	14.5
Phreatic groundwater (deep): 15-30m	3838	13.4	16.4	17.2	41.0	13.7	11.7
Phreatic groundwater (deep): >30m	4567	15.9	11.6	18.9	45.6	14.9	8.9
Captive groundwater	3552	12.4	6.0	10.4	71.6	7.8	4.1
Karstic groundwater	1835	6.4	7.0	14.4	55.0	16.8	6.8
Not indicated	362	1.3	13.8	18.0	30.4	18.0	19.9

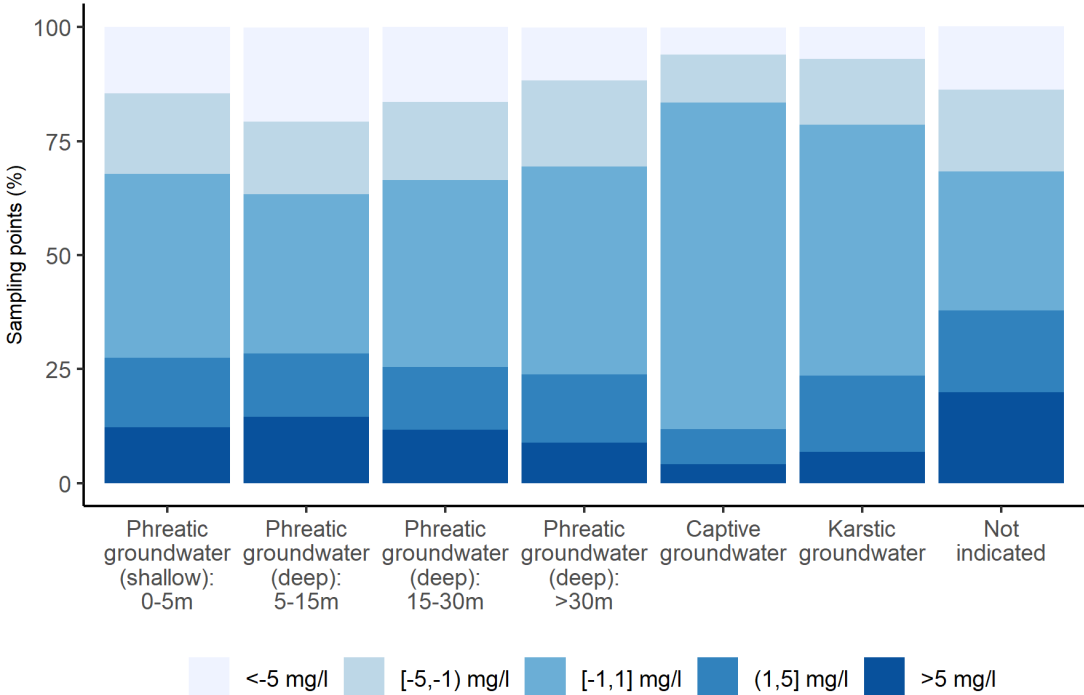


Figure 9: Frequency diagram of trends in annual average nitrate concentrations in groundwater at different depths, aggregated over all Member States. Reporting period 2016-2019