



### Ammonia Screening Results



**DEVELOPMENT:** Erection of a poultry rearing unit including silos and associated works

**LOCATION:** Dolderwen  
Llanafan Fawr  
Builth Wells  
Powys  
LD2 3LN

**CLIENT:** G Jones & Co

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**March 2018**



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## Introduction

It is proposed to erect a poultry rearing unit with silos and associated works at Dolderwen to accommodate a maximum of 38,000 birds.

The purpose of this report is to explain and examine if the proposed development will have any impact on the ecological interest of the area. Particular note is given to the levels of ammonia which shall arise from the proposed poultry unit.

## Location

The proposed development is located on the outskirts of Llanafan Fawr.

It is noted that there is an existing range of modern farm buildings positioned between the Farmhouse and the proposed development. The existence of modern buildings adjoining the proposed development is beneficial as it provides an ideal screen for the development from the Farmhouse.

## Environmental Sites

Within a 10km radius of the application site, there are 35 environmental sites, ranging from 0.21km to 9.7km away from the proposed site and the three closest ancient woodlands have also been assessed:

	Region	Site Name	Site Code	Designation Status	Distance from Installation (m)	Sensitive Habitats
1.	Wales	11423 Ancient Semi Natural Woodland	11423	N/A	247	Sensitive Habitat
2.	Wales	11425 Ancient Semi Natural Woodland	11425	N/A	615	Sensitive Habitat
3.	Wales	11426 Ancient Semi Natural Woodland	11426	N/A	449	Sensitive Habitat
4.	Wales	Afon Irfon (SSSI)	6198	SSSI	217	Non-sensitive Habitat
5.	Wales	River Wye / Afon Gwy	UK0012642	SAC	218	Sensitive Habitat
6.	Wales	Garth Bank Quarry	5776	SSSI	354	Non-sensitive Habitat
7.	Wales	Cae Llety-yr-Efail	5575	SSSI	636	Non-sensitive Habitat



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8.	Wales	Tyncoed Pasture	5565	SSSI	1677	Sensitive Habitat
9.	Wales	Llwyn-Cus	5847	SSSI	2069	Sensitive Habitat
10.	Wales	Caeau Llwyn Gwrgan	6231	SSSI	2161	Sensitive Habitat
11.	Wales	Coed y Ciliau	5490	SSSI	2870	Sensitive Habitat
12.	Wales	Cwm Craig-Ddu Quarry	5162	SSSI	3971	Non-sensitive Habitat
13.	Wales	Llangammarch Wells Quarry	4891	SSSI	4202	Non-sensitive Habitat
14.	Wales	Allt-y-Gest	6585	SSSI	5049	Sensitive Habitat
15.	Wales	Cae Comin Coch	4173	SSSI	5691	Sensitive Habitat
16.	Wales	Llofft-y-Bardd	4463	SSSI	5844	Sensitive Habitat
17.	Wales	River Wye (Upper Wye) / Afon Gwy (Gwy Uchaf)	4637	SSSI	5978	Non-sensitive Habitat
18.	Wales	Rhos Pant-Tyle	4866	SSSI	6736	Sensitive Habitat
19.	Wales	Rhagnentydd Gwy Uchaf / Upper Wye Tributaries	5262	SSSI	6871	Non-sensitive Habitat
20.	Wales	Duhonw	5300	SSSI	7028	Non-sensitive Habitat
21.	Wales	River Wye (Tibutaries) / Afon Gwy (Isafonydd)	4753	SSSI	7410	Non-sensitive Habitat
22.	Wales	Elenydd	UK0012928	SAC	7511	Sensitive Habitat
23.	Wales	Elenydd	4411	SSSI	7511	Sensitive Habitat
24.	Wales	Elenydd - Mallaen	UK9014111	SPA	7511	Sensitive Habitat



25.	Wales	Cors y Llyn	6229	SSSI	7542	Sensitive Habitat
26.	Wales	Gwern-Yfed-Fach Quarry	6091	SSSI	8207	Non-sensitive Habitat
27.	Wales	River Ithon	4559	SSSI	8220	Non-sensitive Habitat
28.	Wales	Caeau Ty'n-Llwyni	5930	SSSI	8432	Sensitive Habitat
29.	Wales	Allt Cynhelyg	5800	SSSI	8608	Sensitive Habitat
30.	Wales	Waen Rydd	5279	SSSI	8677	Sensitive Habitat
31.	Wales	Mynydd Epynt	5255	SSSI	8692	Non-sensitive Habitat
32.	Wales	Mynydd Epynt	UK0030221	SAC	8777	Sensitive Habitat
33.	Wales	Aberithon and Bedw Turbaries	5598	SSSI	8881	Sensitive Habitat
34.	Wales	Neuadd and Tylelo Mires	4982	SSSI	9356	Sensitive Habitat
35.	Wales	Cae Pwll-y-Bo	5322	SSSI	9398	Non-sensitive Habitat
36.	Wales	Pen-Cerrig Stream Section	4342	SSSI	9707	Non-sensitive Habitat
37.	Wales	Llanelwedd Rocks	5196	SSSI	9774	Sensitive Habitat
38.	Wales	Vicarage Meadows	4260	SSSI	9786	Sensitive Habitat

## SCAIL Modelling – Assessment of Ammonia

The SCAIL calculation stands for a Simply Calculation of Atmospheric Impact Limits. It is a screening tool for assessing the impact from agricultural sources on semi-natural areas such as SSSI's. The SCAIL model was developed from the Integrated Pollution Prevention and Control (IPPC) Directive which requires permits for pig and poultry systems with more than a certain number of livestock. It is noted that for poultry units the IPPC directive only applies



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to poultry units with more than 40,000 places. The SCAIL model provides a worse case scenario to the impact of such developments.

The Environment Agency provide detailed guidance regarding Ammonia, Nitrogen and Background levels together with sources, critical loads and levels from farming operations within their document "H1 Environmental Risk Assessment for Permits, Annex B – Intensive Farming" December 2011 (ERA H1).

ERA H1 Section 7.4.3 states that

*"An emission is insignificant where PC process contribution is <4% of Critical Levels for SACs, SPAs and Ramsars, <20% for SSSIs and <50% for local and national nature reserves, ancient woodland and local wildlife sites".*

As well as housing the birds, the application of manure to the land can have an impact on designated sites. The application proposed will see manure taken from the building every 10 days and spread on the available farm land in accordance with the Codes of Good Agricultural and Environmental Condition and Cross Compliance Regulations.

Manure will be:

- Spread in suitable weather conditions
- At least 10 metres away from any water course
- Incorporated into the ground within a maximum of 24 hours after application



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Simple Calculation of Atmospheric Impact Limits

[Scail Home](#) | [User Guide](#) | [SCAIL-Agriculture Report](#) | [Regulator Contact Details](#) | [Contact Us](#) | [Online Tutorial](#)

We have made a number of improvements to the SCAIL for agriculture tool. We have added cattle as a livestock option to cover their emissions. These are set out for housing, landspreading, manure/slurry storage, grazing and outdoor yards. Users can also add their own emissions. The layout should be simpler to use with larger font and input boxes. If you experience any issues then please [Contact Us](#).

Simple Calculation of Atmospheric Impact Limits from Agricultural Sources (SCAIL-Agriculture) is a screening tool for assessing the impact from pig and poultry farms on human health and on semi-natural areas like SSSIs and SACs. The model provides an estimate of the amount of acidity and nitrogen deposited from a farm as well as predictions of air concentrations of odour and PM10. These values can then be used to assess whether impact limits for human health or habitats are exceeded or not.

Information regarding the use of SCAIL-Agriculture as a screening tool and instructions for completing the assessment form are provided in the SCAIL-Agriculture User Guide. The User Guide also contains background information on regulatory requirements for the use of SCAIL-Agriculture, including instances where further detailed modelling of emissions will be required. **The relevant regulatory authority should be consulted for guidance regarding assessment requirements for planning and permitting purposes.**

[LOAD INPUT DATA](#)

Project Details	
Project Notes	Dolderwen
Project Run Mode	<input checked="" type="radio"/> Conservative Met <input type="radio"/> Realistic Met
Location Details	
Select Country	Wales
Installation Details	
Installation	1
Installation Name	Dolderwen
Installation Location	294872,251253 <input type="checkbox"/> Landranger * x,y <a href="#">EXPRESS INPUT LOCATION</a>
Source Details	
Source	1
Source	<input checked="" type="radio"/> Pig <input type="radio"/> Poultry <input type="radio"/> Cattle <input type="checkbox"/> User defined emissions
New or Existing Source	New
Source Name	Dolderwen
Source Location	Provides a link to GoogleMaps to check the location. 294872,251253 <input type="checkbox"/> Landranger * x,y <a href="#">VERIFY LOCATION</a>
Source Type	Housing
Type	Pullets
Details	Fan ventilated, fully filtered floor, non leaking drinkers
Livestock Number	38000
Housing Floor Area	1951 m <sup>2</sup>
Naturally Ventd	<input type="checkbox"/>
Building Height	5.86 m
Fan Location	Roof
No. of Fans (optional)	12

<http://www.scail.ceh.ac.uk/cgi-bin/agriculture/input.pl?action=reload&session=448044476>

1/3



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Fan Diameter	1.040	m	
Fan Flowrate	5.09	m <sup>3</sup> /s	
Total emissions :			
<b>Pollutant</b>	<b>Source Emissions</b>	<b>Running total of all emission sources</b>	<b>Units</b>
NH <sub>3</sub>	2280	2280	(kg)
PM <sub>10</sub> F	1254	1254	(kg)
Odsun	599184000	599184000	(kDu)

OFF EXCEEDED VALUE

## Designated Site details:

Search Radius 10 km NEW RECEPTOR BEACHNo. of Designated Sites 35 VERIFY RECEPTOR LOCATION

Site No.	Name	Distance(km)	Designation	Easting	Northing
1	Afon Irfon	0.217	SSSI	294668	251179.5
2	River Wye / Afon Gwy	0.218	SAC	294674.7	251160.9
3	Garth Bank Quarry	0.354	SSSI	294676.8	250958.2
4	Cae Llety-yr-Efall	0.636	SSSI	294447.2	251726
5	Tynood Pasture	1.677	SSSI	296348.4	252049.1
6	Llwyn-Cus	2.069	SSSI	292838.7	250871.9
7	Caesu Llwyn Gorgan	2.161	SSSI	294098	253270.6
8	Coed y Cilau	2.87	SSSI	294777.8	254122
9	Cwm Craig-Odu Quarry	3.971	SSSI	295146.7	247492.3
10	Llangamarch Wells Quarry	4.202	SSSI	293737.8	247207.3
11	Allt-y-Gest	5.049	SSSI	290012.5	252625
12	Cae Comin Coch	5.691	SSSI	295291.2	254838.3
13	Llofft-y-Bardd	5.844	SSSI	289350.5	253167.5
14	River Wye (Upper Wye) / Afon Gwy (Gwy Uchaf)	5.978	SSSI	300065	254214.4
15	Rhos Pant-Tyle	6.736	SSSI	290351	246259.7
16	Rhagenydd Gwy Uchaf / Upper Wye Tributaries	6.871	SSSI	298018.3	257361
17	Duham	7.028	SSSI	300697.4	247320.5
18	River Wye (Tributaries) / Afon Gwy (Isafonydd)	7.41	SSSI	302081.6	252966.7
19	Elenydd	7.511	SAC	292082.2	258226.8
20	Elenydd	7.511	SSSI	292082.2	258226.8
21	Elenydd - Hallen	7.511	SPA	292082.1	258226.9
22	Cors y Llyn	7.542	SSSI	301319.6	255166.4
23	Gwern-Yfed-Fach Quarry	8.207	SSSI	302965.9	252610.4
24	River Ithen	8.22	SSSI	301286.4	256394.2
25	Caesu Tŷn-Llwyni	8.432	SSSI	290243.4	244204.6
26	Allt Cynhelg	8.608	SSSI	302689	247647.5
27	Wael Rydd	8.677	SSSI	288002.2	245952.9
28	Mynydd Epynt	8.692	SSSI	299330.4	243791.9
29	Mynydd Epynt	8.777	SAC	299368.5	243715.5
30	Aberlithon and Bedw Turbaries	8.881	SSSI	301389.7	257286
31	Nesadd and Tyfelo Mines	9.356	SSSI	303190.4	255535.1
32	Cae Pwll-y-Bo	9.398	SSSI	285474	251177.5
33	Fen-Cerrig Stream Section	9.707	SSSI	304174.2	254026.9
34	Llanfawdd Rocks	9.774	SSSI	304608.5	252102.4
35	Vicarage Meadows	9.786	SSSI	285179.5	252601.8

User specified site 1

Site Name 11423 Ancient Semi Naba

Site Location 294685,251091

11423 Ancient Semi Natural Woodland 0.2km (Grid Ref: 294685, 251091)

Site Code: N/A  
 Designation Status: User defined  
 Distance from Installation (m): 247  
 Receptor Type: Broadleaved, Mixed and Yew Woodland

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H+/ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	1.54	7.98	0.538	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H+/ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge	1.54	12.00	0.810	-	-
Background concentration at receptor edge	0.86	23.38	1.99 (N:1.67 S:0.32)	-	-
	2.4	35.38	2.8	-	-
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	10.0  Broadleaved, Mixed and Yew Woodland	maxN: 3.34 maxS: 2.98 minN: 0.36 Broadleaved, Mixed and Yew Woodland	-	-
% of relevant standard PC	Lower: 154% Upper: 51%	120%	24%	-	-
% of relevant standard PEC	Lower: 240% Upper: 80%	354%	84%	-	-
<b>EXCEEDANCE</b>	Lower: 1.40 Upper: No exceedance	25.38	-0.54	-	-



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11425 Ancient Semi Natural Woodland 0.6km (Grid Ref: 294266, 251359)

Site Code: N/A  
 Designation Status: User defined  
 Distance from Installation (m): 615  
 Receptor Type: Broadleaved, Mixed and Yew Woodland

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H+/ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.41	2.15	0.145	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H+/ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge	0.41	3.20	0.220	-	-
Background concentration at receptor edge	0.86	23.38	1.99 (N:1.67 S:0.32)	-	-
	1.27	26.58	2.21	-	-
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	10.0  Broadleaved, Mixed and Yew Woodland	maxN: 3.34 maxS: 2.98 minN: 0.36 Broadleaved, Mixed and Yew Woodland	-	-
% of relevant standard PC	Lower: 41% Upper: 14%	32%	7%	-	-
% of relevant standard PEC	Lower: 127% Upper: 42%	266%	66%	-	-
<b>EXCEEDANCE</b>	Lower: 0.27 Upper: No exceedance	16.58	-1.13	-	-



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11426 Ancient Semi Natural Woodland 0.4km (Grid Ref: 294978, 251689)

Site Code: N/A  
 Designation Status: User defined  
 Distance from Installation (m): 449  
 Receptor Type: Broadleaved, Mixed and Yew Woodland

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H+/ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.68	3.54	0.239	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H+/ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge	0.68	5.30	0.360	-	-
Background concentration at receptor edge	0.86	23.38	1.99 (N:1.67 S:0.32)	-	-
	1.54	28.68	2.35	-	-
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	10.0  Broadleaved, Mixed and Yew Woodland	maxN: 3.34 maxS: 2.98 minN: 0.36 Broadleaved, Mixed and Yew Woodland	-	-
% of relevant standard PC	Lower: 68% Upper: 23%	53%	11%	-	-
% of relevant standard PEC	Lower: 154% Upper: 51%	287%	70%	-	-
<b>EXCEEDANCE</b>	Lower: 0.54 Upper: No exceedance	18.68	-0.99	-	-



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River Wye / Afon Gwy SAC 0.2km (Grid Ref: 294674, 251160)

Site Code: UK0012642  
 Designation Status: SAC  
 Distance from Installation (m): 218  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	1.82	9.46	0.638	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge	1.82	9.50	0.640	-	-
Background concentration at receptor edge	0.86	15.82	1.40 (N:1.13 S:0.27)	-	-
	2.68	25.32	2.04	-	-
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	10.0 Transition mires and quaking bogs	maxN: 0.49 maxS: 0.17 minN: 0.32 Transition mires and quaking bogs	-	-
% of relevant standard PC	Lower: 182% Upper: 61%	95%	131%	-	-
% of relevant standard PEC	Lower: 268% Upper: 89%	253%	416%	-	-
<b>EXCEEDANCE</b>	Lower: 1.68 Upper: No exceedance	15.32	1.55	-	-



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Tyncoed Pasture SSSI 1.6km (Grid Ref: 296348, 252049)

Site Code: 5565  
 Designation Status: SSSI  
 Distance from Installation (m): 1677  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.08	0.39	0.026	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.08 1.01 1.09	0.42 16.10 16.52	0.028 1.40 (N:1.15 S:0.25) 1.43	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	8.0 Acid grassland	maxN: 0.84 maxS: 0.47 minN: 0.37 Acid grassland	-	-
% of relevant standard PC	Lower: 8% Upper: 3%	5%	4%	-	-
% of relevant standard PEC	Lower: 109% Upper: 36%	207%	170%	-	-
<b>EXCEEDANCE</b>	Lower: 0.09 Upper: No exceedance	8.52	0.59	-	-



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Llwyn-Cus SSSI 2.0km (Grid Ref: 292838, 250871)

Site Code: 5847  
 Designation Status: SSSI  
 Distance from Installation (m): 2069  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.06	0.3	0.02	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.06 0.86 0.92	0.31 15.82 16.13	0.021 1.40 (N:1.13 S:0.27) 1.42	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	8.0 Acid grassland lowland	maxN: 2.08 maxS: 1.64 minN: 0.44 Acid grassland lowland	-	-
% of relevant standard PC	Lower: 6% Upper: 2%	4%	1%	-	-
% of relevant standard PEC	Lower: 92% Upper: 31%	202%	68%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	8.13	-0.66	-	-



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Caeau Llwyn Gwrgan SSSI 2.1km (Grid Ref: 294098, 253270)

Site Code: 6231  
 Designation Status: SSSI  
 Distance from Installation (m): 2161  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H+/ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.06	0.29	0.019	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H+/ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.06 0.86 0.92	0.31 15.82 16.13	0.021 1.40 (N:1.13 S:0.27) 1.42	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	8.0 Acid grassland upland	maxN: 0.86 maxS: 0.49 minN: 0.37 Acid grassland upland	-	-
% of relevant standard PC	Lower: 6% Upper: 2%	4%	2%	-	-
% of relevant standard PEC	Lower: 92% Upper: 31%	202%	165%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	<b>8.13</b>	<b>0.56</b>	-	-



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Coed y Ciliau SSSI 2.8km (Grid Ref: 294777, 254122)

Site Code: 5490  
 Designation Status: SSSI  
 Distance from Installation (m): 2870  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.04	0.3	0.021	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.04 0.86 0.9	0.31 23.38 23.69	0.021 1.99 (N:1.67 S:0.32) 2.01	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	5.0  Broad-leaved, mixed and yew woodland	maxN: 1.64 maxS: 1.35 minN: 0.28 Broad-leaved, mixed and yew woodland	-	-
% of relevant standard PC	Lower: 4% Upper: 1%	6%	1%	-	-
% of relevant standard PEC	Lower: 90% Upper: 30%	474%	123%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	18.69	0.37	-	-



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Offices also at Minsterley & Welshpool

Allt-y-Gest SSSI 5.0km (Grid Ref: 290012, 252625)

Site Code: 6585  
 Designation Status: SSSI  
 Distance from Installation (m): 5049  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H+/ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.02	0.16	0.011	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H+/ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.02 0.86 0.88	0.16 23.38 23.54	0.011 1.99 (N:1.67 S:0.32) 2	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	5.0 Broad-leaved, mixed and yew woodland	maxN: 1.75 maxS: 1.47 minN: 0.28 Broad-leaved, mixed and yew woodland	-	-
% of relevant standard PC	Lower: 2% Upper: 1%	3%	1%	-	-
% of relevant standard PEC	Lower: 88% Upper: 29%	471%	114%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	18.54	0.25	-	-



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Cae Comin Coch SSSI 5.6km (Grid Ref: 299291, 254838)

Site Code: 4173  
 Designation Status: SSSI  
 Distance from Installation (m): 5691  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.02	0.09	0.006	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.02 1.01 1.03	0.10 16.10 16.2	0.007 1.40 (N:1.15 S:0.25) 1.41	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	10.0 Neutral grassland	maxN: 5.07 maxS: 4.00 minN: 1.07 Neutral grassland	-	-
% of relevant standard PC	Lower: 2% Upper: 1%	1%	0%	-	-
% of relevant standard PEC	Lower: 103% Upper: 34%	162%	28%	-	-
<b>EXCEEDANCE</b>	Lower: 0.03 Upper: No exceedance	6.20	-3.66	-	-



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Offices also at Minsterley & Welshpool

Llofft-y-Bardd SSSI 5.8km (Grid ref: 289350, 253167)

Site Code: 4463  
 Designation Status: SSSI  
 Distance from Installation (m): 5844  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.02	0.09	0.006	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.02 0.67 0.69	0.10 14.00 14.1	0.007 1.26 (N:1.00 S:0.26) 1.27	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	8.0 Acid grassland upland	maxN: 0.86 maxS: 0.49 minN: 0.37 Acid grassland upland	-	-
% of relevant standard PC	Lower: 2% Upper: 1%	1%	1%	-	-
% of relevant standard PEC	Lower: 69% Upper: 23%	176%	148%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	<b>6.10</b>	<b>0.41</b>	-	-



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Offices also at Minsterley & Welshpool

Rhos Pant-Tyle SSSI 6.7km (Grid ref: 290351, 246259)

Site Code: 4866  
 Designation Status: SSSI  
 Distance from Installation (m): 6736  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H+/ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.08	0.005	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H+/ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 0.95 0.96	0.05 15.96 16.01	0.004 1.40 (N:1.14 S:0.26) 1.4	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	8.0 Acid grassland	maxN: 2.07 maxS: 1.63 minN: 0.44 Acid grassland	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	1%	0%	-	-
% of relevant standard PEC	Lower: 96% Upper: 32%	200%	68%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	<b>8.01</b>	<b>-0.67</b>	-	-



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Offices also at Minsterley & Welshpool

Elenydd SAC 7.5km (Grid ref: 292082, 258226)

Site Code: UK0012928  
 Designation Status: SAC  
 Distance from Installation (m): 7511  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.07	0.005	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 0.66 0.67	0.05 15.68 15.73	0.004 1.41 (N:1.12 S:0.29) 1.41	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	3.0  Luronium natans	maxN: 0.90 maxS: 0.58 minN: 0.32 Blanket bogs	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	2%	0%	-	-
% of relevant standard PEC	Lower: 67% Upper: 22%	524%	157%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	<b>12.73</b>	<b>0.51</b>	-	-



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Offices also at Minsterley & Welshpool

Elenydd SSSI 7.5km (Grid ref: 292082, 258226)

Site Code: 4411  
 Designation Status: SSSI  
 Distance from Installation (m): 7511  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.07	0.005	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 0.66 0.67	0.05 15.68 15.73	0.004 1.41 (N:1.12 S:0.29) 1.41	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	3.0  Dystrophic loch	maxN: 0.83 maxS: 0.51 minN: 0.32 Bogs	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	2%	0%	-	-
% of relevant standard PEC	Lower: 67% Upper: 22%	524%	170%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	<b>12.73</b>	<b>0.58</b>	-	-



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Offices also at Minsterley & Welshpool

Elenydd – Mallaen SPA 7.5km (Grid ref: 292082, 258226)

Site Code: UK9014111  
 Designation Status: SPA  
 Distance from Installation (m): 7511  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.07	0.005	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 0.66 0.67	0.05 15.68 15.73	0.004 1.41 (N:1.12 S:0.29) 1.41	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	10.0  Falco columbarius	maxN: 0.87 maxS: 0.23 minN: 0.64 Falco columbarius	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	1%	0%	-	-
% of relevant standard PEC	Lower: 67% Upper: 22%	157%	162%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	5.73	0.54	-	-



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Offices also at Minsterley & Welshpool

Cors y Llyn SSSI 7.5km (Grid ref: 301319, 255166)

Site Code: 6229  
 Designation Status: SSSI  
 Distance from Installation (m): 7542  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.07	0.004	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 1.04 1.05	0.05 15.54 15.59	0.004 1.35 (N:1.11 S:0.24) 1.35	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	10.0 Fen, marsh and swamp	maxN: 2.04 maxS: 1.60 minN: 0.44 Fen, marsh and swamp	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	1%	0%	-	-
% of relevant standard PEC	Lower: 105% Upper: 35%	156%	66%	-	-
<b>EXCEEDANCE</b>	Lower: 0.05 Upper: No exceedance	5.59	-0.69	-	-



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Offices also at Minsterley & Welshpool

Caeau Ty'n-Llwyni SSSI 8.4km (Grid ref: 290243, 244204)

Site Code: 5930  
 Designation Status: SSSI  
 Distance from Installation (m): 8432  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.06	0.004	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 0.66 0.67	0.05 15.26 15.31	0.004 1.37 (N:1.09 S:0.28) 1.37	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	10.0 Calcareous grassland	maxN: 5.00 maxS: 4.00 minN: 1.00 Calcareous grassland	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	1%	0%	-	-
% of relevant standard PEC	Lower: 67% Upper: 22%	153%	27%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	5.31	-3.63	-	-



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Allt Cynhelyg SSSI 8.6km (Grid ref: 302689, 247647)

Site Code: 5800  
 Designation Status: SSSI  
 Distance from Installation (m): 8608  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H+/ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.09	0.006	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H+/ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 0.92 0.93	0.08 25.62 25.7	0.005 2.18 (N:1.83 S:0.35) 2.19	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	5.0  Broad-leaved, mixed and yew woodland	maxN: 1.62 maxS: 1.33 minN: 0.28 Broad-leaved, mixed and yew woodland	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	2%	1%	-	-
% of relevant standard PEC	Lower: 93% Upper: 31%	514%	135%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	20.70	0.56	-	-



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Waen Rydd SSSI 8.6km (Grid ref: 288002, 245952)

Site Code: 5279  
 Designation Status: SSSI  
 Distance from Installation (m): 8677  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.06	0.004	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 0.86 0.87	0.05 14.14 14.19	0.004 1.25 (N:1.01 S:0.24) 1.25	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	5.0 Bogs	maxN: 0.84 maxS: 0.52 minN: 0.32 Bogs	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	1%	0%	-	-
% of relevant standard PEC	Lower: 87% Upper: 29%	284%	149%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	9.19	0.41	-	-



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Mynydd Epynt SAC 8.7km (Grid Ref: 299368, 243715)

Site Code: UK0030221  
 Designation Status: SAC  
 Distance from Installation (m): 8777  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H+/ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.06	0.004	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H+/ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 0.70 0.71	0.05 15.68 15.73	0.004 1.39 (N:1.12 S:0.27) 1.39	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	10.0  Drepanocladus (Hamatocaulis) vernicosus	maxN: 0.80 maxS: 0.48 minN: 0.32 Drepanocladus (Hamatocaulis) vernicosus	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	1%	0%	-	-
% of relevant standard PEC	Lower: 71% Upper: 24%	157%	174%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	5.73	0.59	-	-



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Aberithon and Bedw Turbaries SSSI 8.8km (Grid ref: 301389, 257286)

Site Code: 5598  
 Designation Status: SSSI  
 Distance from Installation (m): 8881  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H+/ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.08	0.006	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H+/ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 1.04 1.05	0.08 23.24 23.32	0.005 1.35 (N:1.11 S:0.24) 1.36	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	5.0  Broad-leaved, mixed and yew woodland	maxN: 2.04 maxS: 1.60 minN: 0.44 Fen, marsh and swamp	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	2%	0%	-	-
% of relevant standard PEC	Lower: 105% Upper: 35%	466%	67%	-	-
<b>EXCEEDANCE</b>	Lower: 0.05 Upper: No exceedance	18.32	-0.69	-	-



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Neuadd and Tylelo Mires SSSI 9.3km (Grid ref: 303190, 255535)

Site Code: 4982  
 Designation Status: SSSI  
 Distance from Installation (m): 9356  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.05	0.004	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 1.04 1.05	0.05 15.54 15.59	0.004 1.35 (N:1.11 S:0.24) 1.35	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	8.0 Acid grassland	maxN: 2.04 maxS: 1.60 minN: 0.44 Acid grassland	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	1%	0%	-	-
% of relevant standard PEC	Lower: 105% Upper: 35%	195%	66%	-	-
<b>EXCEEDANCE</b>	Lower: 0.05 Upper: No exceedance	7.59	-0.69	-	-



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Llanelwedd Rocks SSSI 9.7km (Grid Ref: 304608, 252102)

Site Code: 5196  
 Designation Status: SSSI  
 Distance from Installation (m): 9774  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.05	0.003	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge Background concentration at receptor edge	0.01 1.06 1.07	0.05 17.08 17.13	0.004 1.50 (N:1.22 S:0.28) 1.5	- - -	- - -
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	8.0 Acid grassland	maxN: 0.83 maxS: 0.46 minN: 0.22 Acid grassland	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	1%	0%	-	-
% of relevant standard PEC	Lower: 107% Upper: 36%	214%	181%	-	-
<b>EXCEEDANCE</b>	Lower: 0.07 Upper: No exceedance	9.13	0.67	-	-



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Vicarage Meadows SSSI 9.7km (Grid ref: 285179, 252601)

Site Code: 4260  
 Designation Status: SSSI  
 Distance from Installation (m): 9786  
 Receptor Type: Habitat

Installation Information

No.	Name	No. of sources	No. of new sources	PM <sub>10</sub> (t/a)	NH <sub>3</sub> (t/a)	Odour (kOu/a)	Conc NH <sub>3</sub> (µg/m <sup>3</sup> )	Dep N (kg/ha/yr)	Dep Acid (kEq H <sup>+</sup> /ha/yr)	Conc PM <sub>10</sub> (µg/m <sup>3</sup> )	Conc Odour (Ou/m <sup>3</sup> )
1	Dolderwen	1	1	-	2.3	-	0.01	0.05	0.003	-	-

Total Depositions/Concentrations and Exceedances

Concentrations/Depositions and Critical Loads/Levels	NH <sub>3</sub> (µg/m <sup>3</sup> )	N Dep. (kg N/ha/yr)	Acid Dep. (kEq H <sup>+</sup> /ha/yr)	PM <sub>10</sub> (µg/m <sup>3</sup> )	Odour (Ou/m <sup>3</sup> )
Process Contribution (PC) at receptor edge	0.01	0.05	0.004	-	-
Background concentration at receptor edge	0.67	14.00	1.26 (N:1.00 S:0.26)	-	-
	0.68	14.05	1.26	-	-
<b>Predicted Environmental Concentration/Deposition (PEC)</b>					
Environmental Assessment Level or Critical Load / Level	Lower: 1 Upper: 3	8.0 Acid grassland	maxN: 0.86 maxS: 0.49 minN: 0.37 Acid grassland	-	-
% of relevant standard PC	Lower: 1% Upper: 0%	1%	0%	-	-
% of relevant standard PEC	Lower: 68% Upper: 23%	176%	147%	-	-
<b>EXCEEDANCE</b>	Lower: No exceedance Upper: No exceedance	<b>6.05</b>	<b>0.40</b>	-	-



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SSSI Name	Background Levels		Contribution to ammonia average (NH3) concentration from this proposal	Critical level for habitat (ug)	% contribution to NH3 critical levels (CL for habitat is 3ug)*	Contribution to Nitrogen (N) deposition from this proposal	CL for habitat (kg/ha /yr)	% contribution to N critical loads (CL for habitat Low Level)
	NH3 (ug)	N (kg)						
11423 Ancient Semi Natural Woodland	0.86	23.38	1.54	3	51.3%	12.00	10	120%
11425 Ancient Semi Natural Woodland	0.86	23.38	0.41	3	13.6%	3.20	10	32%
11426 Ancient Semi Natural Woodland	0.86	23.38	0.68	3	22.6%	5.30	10	53%
River Wye / Afon Gwy	0.86	15.82	1.82	3	60.6%	9.50	10	95%
Tyncoed Pasture	1.01	16.10	0.08	3	2.66%	0.42	8	5.25%
Llwyn-Cus	0.86	15.82	0.06	3	2%	0.31	8	3.87%
Caeau Llwyn Gwrgan	0.86	15.82	0.06	3	2%	0.31	8	3.87%
Coed y Ciliau	0.86	23.38	0.04	3	1.33%	0.31	5	6.2%
Allt-y-Gest	0.86	23.38	0.02	3	0.66%	0.16	5	3.2%
Cae Comin Coch	1.01	16.10	0.02	3	0.66%	0.10	10	1%
Llofft-y-Bardd	0.67	14.00	0.02	3	0.66%	0.10	8	1.25%
Rhos Pant-Tyle	0.95	15.96	0.01	3	0.33%	0.05	8	0.625%
Elenydd	0.66	15.68	0.01	3	0.33%	0.05	3	1.66%
Elenydd	0.66	15.68	0.01	3	0.33%	0.05	3	1.66%
Elenydd - Mallaen	0.66	15.68	0.01	3	0.33%	0.05	10	0.5%
Cors y Llyn	1.04	15.54	0.01	3	0.33%	0.05	10	0.5%
Caeau Ty'n-Llwyni	0.66	15.26	0.01	3	0.33%	0.05	10	0.5%



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Allt Cynhelyg	0.92	25.62	0.01	3	0.33%	0.08	5	1.6%
Waen Rydd	0.86	14.14	0.01	3	0.33%	0.05	5	1%
Mynydd Epynt	0.70	15.68	0.01	3	0.33%	0.05	10	0.5%
Aberithon and Bedw Turbaries	1.04	23.24	0.01	3	0.33%	0.08	5	1.6%
Neuadd and Tylelo Mires	1.04	15.54	0.01	3	0.33%	0.05	8	0.625%
Llanelwedd Rocks	1.06	17.08	0.01	3	0.33%	0.05	8	0.625%
Vicarage Meadows	0.67	14.00	0.01	3	0.33%	0.05	8	0.625%

Please see Appendix 1 for information regarding ventilation design with partial air cleaning which will reduce ammonia emissions by 80%.

## Conclusion

Based upon the results of the preliminary ammonia screening assessment, it is considered that the CCW would not require further modelling of ammonia emissions for the proposed poultry farm as ammonia emissions have been screened as insignificant following use of the SCAIL screening tool.



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## Appendix 1

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# Ventilation design with partial air cleaning

If air cleaning is too expensive, the poultry industry will just move to countries or regions with less strict environmental regulation. For the farmers it would be much too expensive to clean all the exhausted air from a poultry house. The key to get a realistic air cleaning solution in the poultry industry is to combine the MAC with "Partial air cleaning". But what is Partial air cleaning?"

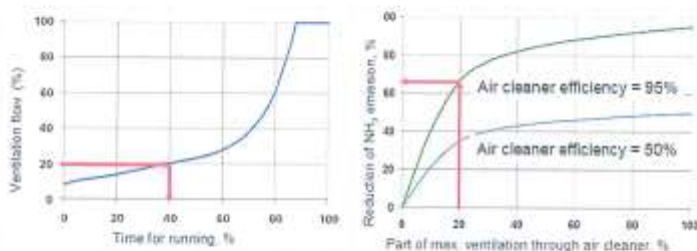
### Definition

In many regions with intensive animal production the ventilation rate is only running at maximum capacity for a limited number of hours a year. On most days, only a few of the fans are running most of the year. If you clean the air from these few fans, you will clean all the air from the livestock building most of the hours during a year.

When you install partial air cleaning in a house, the first few fans that are turned on are the only fans which use the cleaning system.

### Example

As an example we can take a layer house in Denmark. If the desired room temperature inside a house is 21°C and the total ventilation capacity is 10m<sup>3</sup>/h per bird, the ventilation will be running under 20% of full ventilation capacity for 40% of the yearly running time. This means that if you install an air cleaner in this house, which cleans the first 20% of the exhausted air, all of the air in the building will pass through the air cleaner for 40% of the yearly running time. This is illustrated in the figure below.



By cleaning the first 20% of the exhausted air from a layer house, with a cleaning efficiency of 80%, we will remove around 58% of the total amount of nitrogen that is normally discharged through the outlets fans. For example, if a layer house with 13,000 birds has an ammonia emission through the exhaust fans of 3560kg, the air cleaner can remove 2060kg ammonia. The removed ammonia is collected in a tank and can be used as fertilizer.

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In general, strict ammonia emission regulations are not good for the farmers and Munters, because they limit the amount of animals in certain areas, and in turn the amount of ventilation equipment we can sell. The development of the air cleaner has been done in order to help farmers enlarge their production facilities in areas where laws prevent growth because of high ammonia levels. The MAC combined with "partial air cleaning" is a great way to get an economic realistic solution to this issue.

If you would like to get further information of the benefits of the MAC combined with partial air cleaning in your local climate do not hesitate to **contact Merete Lyngbye** at Munters Denmark. Merete has access to weather information all over the world and together with the local sales team she can help you to calculate the ammonia reduction for your local climate conditions.



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Product Information  
Air Cleaner for Poultry

- Ammonia reduced by 80% on average
- Maximum ammonia reduction from start-up
- Dust reduction
- Non-clogging filters
- Efficient droplet separators
- Droplets separators can be slide out and washed outside
- Easy maintenance
- User friendly
- Easy to install
- Corrosion resistant material

## Air Cleaner for Poultry

Ammonia is a natural residual product from livestock production and because of environmental regulations many farmers are facing limits for ammonia emission – especially when they increase their animal production. In order to make it possible for farmers to enlarge their production in areas with ammonia restrictions, Munters has developed air cleaners.

The Munters Air Cleaner (MAC) was designed to deal with the unique environmental challenges offered by cleaning exhaust air from a poultry building. Such air contains a heavy load of sticky dust, which is very difficult to remove from the air stream and sticks to all elements of the air cleaner. The MAC features a droplet separator that can handle such conditions and which is easily accessible and removable for periodic cleaning. This innovative design reduces ammonia emission by more than 80% and was also awarded with the Agromek Prize in 2012 for its user friendly cleaning system.



Air Cleaner for Poultry

Munters A/S  
Nordvestvej, 3 - 9600 Aars, Denmark / Phone +45 986 233 11 / Fax +45 986 213 54 / [munters.com](http://munters.com)



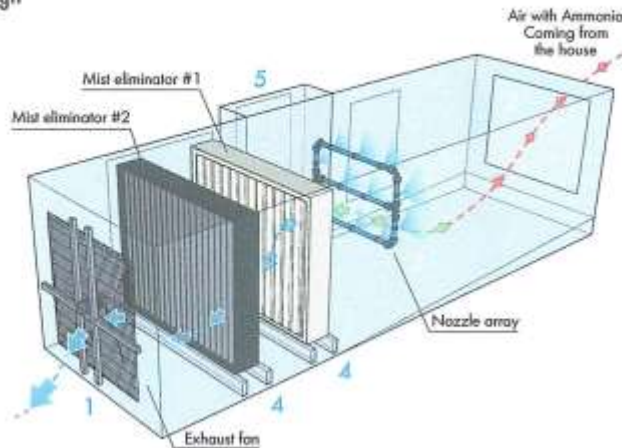
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## Design



The air cleaner consists of a long box. In one end of the box is a fan (1), which extracts air from the building (2) through the box. In the air cleaner is a nozzle array (3), which sprinkles droplets consisting of a mixture of water and sulphuric acid. When the extracted air containing ammonia passes over the droplets, the ammonia molecules in the air react with the liquid. The droplets fall to the bottom of the box or are collected by the droplet separators (4) and led to the bottom of the box. Thus the ammonia is separated from the ventilation air before the air is released to the surroundings.

On one side of the box is a technical cabinet (5). The technical cabinet consists of a controller, a pump which circulates the liquid between the bottom of the box and the nozzles and a dosing pump which adds acid to maintain a constant pH level in the liquid. In the bottom of the air cleaner is a bilge, which pumps liquid to a storage tank. The separated liquid can be used as a fertilizer on the field.

The air cleaner is distinguished by high ammonia reduction and that it doesn't have any filters. Compared to conventional filters the droplet separators are easy to clean. Another advantage is that the droplet separator can be pulled out of the box and washed from outside with a traditional high pressure cleaner. This provides a good working environment and easy maintenance. The air cleaner is simply built, with the phrase "Keep it simple" been used during the whole development process.

## Partial air cleaning

By using a MAC it is not necessary to clean all the air from a poultry house. In many climate zones in the world, there is a huge variation in outdoor temperature during the year. Typically the livestock housing units are cooled by outside air, which results in a much lower ventilation rate in the house during winter compared to the summer period. In contrast to the yearly differences in ventilation rate, the variation of the ammonia evaporation in the housing unit during the year is negligible.

In Denmark the ventilation rate is less than 20% of the maximum capacity for more than 40% of the time during a year. That means, if an air cleaner is able to clean the first 20% of the maximum ventilation capacity, then 100 % of the ventilated air is cleaned during 40% of the hours in a year. Additionally the air cleaner will clean 20% of the maximum ventilation capacity rest of the year.

An example - A MAC connected to a layer house in Denmark with 13,000 birds and a room temperature of 21 °C will have 20% partial air cleaning. The first 20% of the air will go through the air cleaner and get cleaned with an efficiency of 80%. The rest of the air will leave the house uncleaned through traditional exhaust fans. During a year the ammonia emission will be reduced by 58% and more than 2,000 kg of ammonia will be collected and available as fertilizer.

- **Efficiency:**  
80% ammonia reduction in average for 4-80 ppm before air cleaner.

- **Flow:**  
25.000 m<sup>3</sup>/hour at 40 Pa.

- **Plug and play:**  
As soon as the air cleaner is started the maximum ammonia reduction will be achieved. No biological material needs to form. You can, for instance, wait until day 10 to start the air cleaner, as the ammonia emission in the beginning of a production cycle is limited.

- **Keep it simple:**  
The MAC has a simple design which is an advantage according to maintenance and service.

- **No filters:**  
The ammonia is captured by droplets suspended in the air stream.

- **Extraction system:**  
Droplet separators can be drawn out and washed from outside.

- **MAC connected to a layer house with 13,000 birds:**
  - 20% partial air cleaning;
  - 80% ammonia reduction through air cleaner;
  - 58% ammonia reduction from layer house;
  - 2,000 kg ammonia captured.

Air Cleaner is developed and produced by Munters A/S, Denmark

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