

Air quality assessment of the production of hydrocarbons from an existing well site Horse Hill Developments Limited, Horse Hill Well Site, Hookwood Schedule 5 Notice 2 (Air Quality points 21 a, b & c)

1 Introduction

Horse Hill Developments Limited propose to develop an existing well site, known as the Horse Hill well site at Horse Hill near Hookwood. One exploratory well (HH1) has already been drilled and flow tested while a further well (HH2) has consent for drilling and flow testing. The aim of the current application is to drill and test a further four wells (HH3 to HH6) over a period of four years, while simultaneously undertaking a 20 year programme of commercial production of oil from the HH1 well.

As part of the planning and permitting process, the dispersion of releases to atmosphere associated with the proposed operations were assessed to determine their impact on ambient concentrations of important pollutants around the local area. The most recent assessment was undertaken by SOCOTEC UK Limited in January 2021 (SOCOTEC report LSO 210118, 21 January 2021 – Annex 2). In response to the associated permitting application, the Environment Agency has issued a Schedule 5 notice with point 21 relating directly to the air quality assessment:

21.0	Request:	<p>a) Please can you update your Gas Management plan to take into account the following...</p> <p>b) If available, please provide supporting evidence to justify the modelled NOX emissions, such as manufacturer's specifications.</p> <p>c) Please submit the habitats assessment at these sites and include contour plots, showing the extension of impacts of from scenarios A and B at these sites.</p>
	Reason:	<p>... Please justify that the schedule is reasonably representative of operations (i.e. scheduling is not a variable) or demonstrate that the conclusions are still valid when the equipment does not operate according to the project program.</p> <p>We found that modelled NOX emissions are inconsistent amongst various sources of information for the engines associated with the drilling stage: mud pump generators, rig engine and rig power system. Please clarify how the modelled NOX emission rates were derived.</p> <p>Our internal Geographic Information Systems show a number of local nature sites within 2 km that were not considered by the applicant. These are local wildlife sites and ancient woodlands such as Wrays Wood located approximately 350 m north east, Woods West of Crutchfield Copse 1 - South, Crutchfield Copse, Withy Gill, Collendean Copse, Rowgardens Wood, Bush House Copse and Roundwood Lodge, Chantersluer Wood, an ancient woodland at Spencers Lane, and Telvet Copse, among others. Please consider our modelling guidance available at https://www.gov.uk/guidance/environmental-permitting-air-dispersion-modelling-reports</p>

This note addresses the queries raised in point 21 of the Schedule 5 notice.

2 Point 21a

The Environment Agency requested that justification be provided to demonstrate that either the development schedule is reasonably representative of operations (i.e. scheduling is not a variable) or that the conclusions are still valid when the equipment does not operate according to the project program.

The development program is described in Table 3.18 of the assessment and is based on 20 years' production operations on the existing HH1 well and four overlapping years of drilling and appraisal operations on a further four wells (HH3 to HH6, one in each year).

For the purposes of the assessment two distinct operating scenarios were identified which generally cover the main activities during the project:

Scenario	Activity
A Drilling, testing and production	Well site construction, drilling and testing of well HH3 and production of oil from HH1.
B Production only	Production of oil from HH1.

The scenarios considered are based on the combination of consecutive activities which could potentially run over a period of 12 months as described in Table 3.19 of the assessment. The selection of activities is based on an examination of the pollutant release rates from each year of proposed operations as summarised in Table 2.1.

Table 2.1 Annual pollutant release rates

Year	Average daily release rate (kg/day)				
	CO	VOC	NO _x	Particulate matter	SO ₂
1	134.66	23.37	228.48	8.05	0.78
2	121.80	22.31	215.67	7.34	0.76
3	121.80	22.31	215.67	7.34	0.76
4	121.80	22.31	215.67	7.34	0.76
5-20	40.13	7.27	41.06	2.47	0.25

For scenario A, year 1 activities, by virtue of the inclusion of well site construction, provide the greatest average release rates and are selected as representing a worst case for Years 1 to 4.

It should also be noted that in all cases the equipment associated with each activity (see Table 3.20 of the assessment) is assumed to operate continuously at full load. This is considered to represent a significant over estimate of pollutant releases in practice.

While scheduling may vary from that assumed, it is understood that only one well will be appraised in any 12 month period. Therefore, Scenario A represents a worst case in terms of air quality impact, particularly in view of the assumptions regarding equipment operation. The conclusions of the assessment are based on the worst case and as such any changes to the schedule will not have a detrimental impact on the original assessment conclusions. It is expected that the air quality impact will be comfortably less in practice than that estimated within the assessment.

3 Point 21b

The Environment Agency were unable to verify the modelled nitrogen oxides emission rates for the engines associated with the drilling rig based on available information and requested that this be clarified.

Pollutant emission rates from the stationary diesel-fired engines are based on the engine's rated power output (kW) and the corresponding engine emission standard (g/kWh) where available.

For the drilling rig, the available specifications for the associated engines do not confirm compliance with either US or EU emission standards. Horse Hill Developments will ensure that all engines, with the exception of the rig generator, employed in the drilling rig are, as a minimum, compliant with US EPA Tier 2 emission standards. The specification for the rig generator provides the manufacturer's assessment of pollutant releases, which are accepted for the assessment. It should be noted that these emissions rates are greater than those calculated based on the US EPA Tier 2 standards.

US EPA Tier 2 standards specify combined nitrogen oxides and non-methane hydrocarbons emission limit of 6.4 g/kWh for engines of a power output of 225 kW and above. It is assumed that nitrogen oxides comprise 92.6% of the total with the remainder being non-methane hydrocarbons based on emission rates

for diesel engines within AP-42. The emission factor for nitrogen oxides is therefore estimated at 5.9 gNO₂/kWh.

Where a fuel consumption is quoted, the engine power output is based on an assumed brake specific fuel consumption of 0.21 kg/kWh and a fuel density of 0.874 kg/l (at 0°C).

Where releases are based on the manufacturer's specified emission concentration (mg/m³), a unit flue gas volume rate of 18.7 m³/l of diesel expressed on a wet basis at STP, is assumed based on combustion calculations for a standard diesel composition and an exhaust gas oxygen concentration of 10% (dry basis).




For the rig engine, the total power output includes 88 kW and 55 kW associated with the accommodation module and all terrain forklift respectively. Both are assumed US Tier 2 compliant for simplicity, although it is known that operate at the more stringent EU Stage 3B standard.

Table 3.1 summarises the determination of nitrogen oxides release rates for the engines associated with the drilling rig and Table 3.2 provides snapshots of the relevant parts of the manufacturer's engine specification.

Table 3.1 Determination of engines releases

Engine		Rig engine	Mud pump engine	Rig generator
		Detroit 12V71	Caterpillar 3512A	Caterpillar 3412
Specified power output	kW	497 (354+88+55)	-	-
Specified fuel consumption	l/h	-	305.4	191.7
Calculated power output	kW	-	1271	795
Calculated flue gas volume (STP, wet)	m ³ /s	-	-	0.9956
NO _x emission factor		5.9 gNO ₂ /kWh	5.9 gNO ₂ /kWh	2955 mgNO ₂ /m ³
NO _x release rate	gNO ₂ /h	2945	7532	-
	gNO ₂ /s	0.818	2.093	2.942
Assessed release rate (Table 3.6 of assessment)	g/s	0.818	2.093	2.942

Table 3.2 Manufacturer's engine specification

Rig generator – Caterpillar 3412 C TA – (Standby 720eW 900kVA) – September 2011		
STANDBY 720 ekW 900 kVA		
50 Hz 1500 rpm 400 Volts		
TECHNICAL DATA		
Open Generator Set - - 1500 rpm/50 Hz/400 Volts		DM1909
Package Performance Genset Power rating @ 0.8 pf Genset Power rating with fan	900 kVA 720 ekW	
Fuel Consumption 100% load with fan 75% load with fan 50% load with fan	191.7 L/hr 143.7 L/hr 99.6 L/hr	50.6 Gal/hr 38.0 Gal/hr 26.3 Gal/hr
Cooling System' Air flow restriction (system)	0.12 kPa	0.48 in. water
Emissions ³ NOx mg/nm ³ CO mg/nm ³ HC mg/nm ³ PM mg/nm ³		2954.8 mg/nm ³ 454.4 mg/nm ³ 143.1 mg/nm ³ 64.8 mg/nm ³
Mud pump generator – Caterpillar 3512 TA (110ekW 1375 kVA) – July 2011		
STANDBY 1100 ekW 1375 kVA		
60 Hz 1800 rpm 480 Volts		
TECHNICAL DATA		
Open Generator Set - - 1800 rpm/60 Hz/480 Volts		DM8224
Low Fuel Consumption		
Generator Set Package Performance Genset Power rating @ 0.8 pf Genset Power rating with fan	1375 kVA 1100 ekW	
Coolant to aftercooler Coolant to aftercooler temp max	82 ° C	180 ° F
Fuel Consumption 100% load with fan 75% load with fan 50% load with fan	305.4 L/hr 232.6 L/hr 167.0 L/hr	80.7 Gal/hr 61.4 Gal/hr 44.1 Gal/hr
Rig engine – Detroit 12V-71		
 <p>Typical 12V-71 Fan-to-Flywheel Model</p>		
Basic Engine	12V-71 N65 Injectors	
Model	7123-7000	
Description	Naturally Aspirated	
Number of Cylinders	12	
Bore and Stroke	4.25 in x 5 in (108 mm x 127 mm)	
Displacement	852 cu in (13.97 litres)	
Rated Gross Power: 60°F (15.6°C) and 29.92 in Hg	475 BHP (354 kW)	

It may be noted that release rates assume continuous operation for the intended duration at full load conditions. This represents a highly unlikely worst case condition and will result in a predicted air quality impact which is higher than that in practice.

4 Point 21c

The Environment Agency's review of conservation sites requiring assessment, based on their own Geographic Information Systems, showed that a number of local nature sites, within 2 km of the well site, were not considered in the assessment.

Local Council records and the MAGIC database have been further reviewed to identify local nature sites within 2km of the well site. In total, 19 locally designated sites were identified within a 2km radius of the well site. The assessment, as described in section 3 of the assessment report, was repeated to include these additional 19 sites. For the purposes of the assessment each site is described by a single discrete receptor positioned on the boundary of the site closest to the well site. Table 4.1 describes the site locations and the position of each discrete receptor.

Table 4.1 Location of local nature conservation sites

Receptor No.	Site	Receptor location		
		Easting (m)	Northing (m)	Position ^a
1	Rowgardens Wood	524853	143682	443 m W
2	Wrays Wood	525291	144043	433 m N
3	Wood at Cottendean Farm	524600	143902	749 m NW
4	Cottendean Copse	524819	144648	1140 m NW
5	Wood at Roundwood Lodge	525232	144649	1041 m N
6	Crutchfield Copse	525823	144468	1010 m NE
7	Wood NE of Crutchfield Copse	526107	145026	1635 m NE
8	Wood N of Duxhurst Cottage	525464	145194	1594 m N
9	Bush House Copse	524705	145036	1541 m N
10	Wood near Little Mynthurst Farm	523774	144810	1933 m NW
11	Wood near Rose Cottage Farm	523911	144279	1533 m NW
12	Chantersluer Wood	523626	143518	1667 m W
13	Edolph's Copse LNR	523549	142745	1944 m SW
14	Spencers Lane Woodland 1	524942	142514	1150 m S
15	Spencer's Lane Woodland 2	524969	142394	1258 m S
16	Telvet Copse	525129	142222	1397 m S
17	Woodland near Cherry Tree Farm	523384	144223	2002 m W
18	Withy Gill SNCI	527129	143099	1909 m E
19	Woodland N of Crutchfield Copse	525532	144524	945 m N

a. Position is relative to the centre of the well site.

The main pollutants of interest at these sites are nitrogen oxides, nitrogen dioxide and sulphur dioxide and their contribution in respect of critical levels for nitrogen oxides and sulphur dioxide and critical loads for nitrogen and acid deposition.

Most of the local sites identified are designated as ancient and semi-natural woodland. For the purposes of the assessment, the associated critical levels and critical loads were assumed to be consistent with a Broadleaved, Mixed and Yew Woodland habitat. The associated critical levels and loads for each site, obtained from the Air Pollution Information System (APIS) are summarised in Table 4.2.

It may be noted that a daily mean critical level for nitrogen oxides of 200 µg/m³ has been selected based on Institute of Air Quality Management guidance (A guide to the assessment of air quality impacts on designated nature conservation sites 2020, version 1.1, May 2020). Where a short term critical level is required, a critical level of 200 µgNO₂/m³ is considered appropriate. This guidance is based on World Health Organisation findings that short term critical levels for nitrogen oxides reduce when elevated nitrogen oxides concentrations are combined with elevated levels of ozone or sulphur dioxide at or above

their respective critical levels. For the sites considered herein, background levels of sulphur dioxide and ozone are comfortably within their critical levels:

Maximum annual mean for sulphur dioxide is 2.14 $\mu\text{gSO}_2/\text{m}^3$ compared with a critical level of 10 $\mu\text{gSO}_2/\text{m}^3$ (reference Air Pollution Information System)

Accumulated ozone exposure above threshold of 40 ppb (AOT40) is 852 $\mu\text{g}/\text{m}^3\text{h}$ compared with an objective of 6000 $\mu\text{g}/\text{m}^3\text{h}$ (reference London Hillingdon monitoring station hourly measurements for 0800 to 2000 during May, June and July).

It is therefore considered reasonable to adopt a daily mean critical level for nitrogen oxides of 200 $\mu\text{gNO}_2/\text{m}^3$.

Table 4.2 Critical level and critical loads for local sites

Site	Critical levels			Critical loads			
	Nitrogen oxides annual mean $\mu\text{gNO}_2/\text{m}^3$	Nitrogen oxides daily mean $\mu\text{gNO}_2/\text{m}^3$	Sulphur dioxide annual mean $\mu\text{gSO}_2/\text{m}^3$	Nitrogen deposition kgN/ha/y	Acid deposition		
					CLmax S Keg/ha/y	CLmin N Keg/ha/y	CLmax N Keg/ha/y
1	30	200	10	10	2.878	0.357	3.235
2	30	200	10	10	2.655	0.357	3.012
3	30	200	10	10	2.878	0.357	3.235
4	30	200	10	10	2.634	0.357	2.991
5	30	200	10	10	2.655	0.357	3.012
6	30	200	10	10	2.655	0.357	3.012
7	30	200	10	10	2.666	0.357	3.023
8	30	200	10	10	2.666	0.357	3.023
9	30	200	10	10	2.669	0.357	3.026
10	30	200	10	10	2.637	0.357	2.994
11	30	200	10	10	2.637	0.357	2.994
12	30	200	10	10	2.639	0.357	2.996
13	30	200	10	10	2.882	0.357	3.239
14	30	200	10	10	2.879	0.357	3.236
15	30	200	10	10	2.879	0.357	3.236
16	30	200	10	10	2.902	0.357	3.259
17	30	200	10	10	2.637	0.357	2.994
18	30	200	10	10	2.021	0.357	2.378
19	30	200	10	10	2.655	0.357	3.012

The background concentrations at each site, as obtained from APIS, are summarised in Table 4.3. These represent the background concentration at the discrete receptor location.

Table 4.3 Background concentrations for local sites

Site	Nitrogen oxides annual mean µgNO ₂ /m ³	Sulphur dioxide annual mean µgNO ₂ /m ³	Nitrogen deposition kgN/ha/y	Acid deposition	
				Nitrogen Keq/ha/y	Sulphur Keq/ha/y
1	14.96	0.91	26.74	1.91	0.21
2	15.22	2.14	29.82	2.13	0.27
3	14.96	0.91	26.74	1.91	0.21
4	14.36	0.91	26.74	1.91	0.21
5	15.22	2.14	29.82	2.13	0.27
6	15.22	2.14	29.82	2.13	0.27
7	15.58	1.05	28.28	2.02	0.26
8	14.69	1.05	28.28	2.02	0.20
9	14.26	0.85	27.30	1.95	0.19
10	14.01	0.91	26.74	1.91	0.21
11	14.01	0.91	26.74	1.91	0.21
12	13.84	0.91	26.74	1.91	0.21
13	13.97	0.91	26.74	1.91	0.21
14	16.4	0.91	26.74	1.91	0.21
15	16.4	0.91	26.74	1.91	0.21
16	18.2	2.14	29.82	2.13	0.27
17	14.01	0.91	26.74	1.91	0.21
18	20.84	2.14	29.82	2.13	0.27
19	15.22	2.14	29.82	2.13	0.27

The maximum process contributions to concentrations of nitrogen oxides and sulphur dioxide at the local sites are summarised in Table 4.4 for operational scenario A.

Table 4.4 Maximum process contributions of nitrogen oxides and sulphur dioxide at the local sites – Scenario A

Site	Maximum process contribution (PC) and predicted environmental concentration (PEC) (% of critical level)					
	Nitrogen oxides annual mean		Nitrogen oxides daily mean		Sulphur dioxide annual mean	
	PC	PEC	PC	PEC	PC	PEC
1	6.3	56	30.5	45	0.048	9.1
2	10.2	61	33.0	48	0.091	21.5
3	2.1	52	11.9	27	0.014	9.1
4	1.7	50	8.9	23	0.012	9.1
5	2.9	54	14.8	30	0.022	21.4
6	8.1	59	16.8	32	0.072	21.5
7	4.4	56	9.6	25	0.037	10.5
8	2.1	51	7.6	22	0.017	10.5
9	1.2	49	6.2	21	0.008	8.5
10	0.7	47	5.3	20	0.005	9.1
11	0.8	47	6.2	20	0.006	9.1
12	1.8	48	7.5	21	0.009	9.1
13	2.7	49	7.6	22	0.013	9.1

Table 4.4 continued

Site	Maximum process contribution (PC) and predicted environmental concentration (PEC) (% of critical level)					
	Nitrogen oxides annual mean		Nitrogen oxides daily mean		Sulphur dioxide annual mean	
	PC	PEC	PC	PEC	PC	PEC

14	5.7	60	16.2	33	0.031	9.1
15	4.6	59	13.5	30	0.025	9.1
16	2.7	63	10.3	29	0.015	21.4
17	0.6	47	5.6	20	0.004	9.1
18	1.7	71	4.7	26	0.012	21.4
19	5.3	56	16.4	32	0.045	21.4

At all local sites for Scenario A operation, process contributions of nitrogen oxides and sulphur dioxide are less than the applicable critical levels and as such are considered insignificant.

The determination of nitrogen deposition at the local sites is summarised in Table 4.5. The determination was undertaken in accordance with the guidance in AQTAG 06 and considered dry deposition only. Guidance indicates that wet deposition over relatively short distances is unlikely to be significant.

Table 4.5 Nitrogen deposition at local sites – Scenario A

Site	Maximum process nitrogen contribution				Predicted environmental concentration	
	ugNO ₂ /m ² /a	kgN/ha/y	%CL	Keq/ha/y	kgN/ha/y	%CL
1	0.0040	0.38	3.8	0.0272	26.77	271
2	0.0064	0.61	6.1	0.0439	29.86	304
3	0.0013	0.13	1.3	0.0090	26.75	269
4	0.0011	0.10	1.0	0.0074	26.75	268
5	0.0018	0.17	1.7	0.0124	29.83	300
6	0.0051	0.49	4.9	0.0351	29.86	303
7	0.0028	0.27	2.7	0.0192	28.30	285
8	0.0013	0.13	1.3	0.0090	28.29	284
9	0.0008	0.07	0.7	0.0052	27.31	274
10	0.0004	0.04	0.4	0.0029	26.74	268
11	0.0005	0.05	0.5	0.0034	26.74	268
12	0.0011	0.11	1.1	0.0077	26.75	268
13	0.0017	0.16	1.6	0.0116	26.75	269
14	0.0036	0.34	3.4	0.0245	26.76	271
15	0.0029	0.28	2.8	0.0197	26.76	270
16	0.0017	0.16	1.6	0.0117	29.83	300
17	0.0004	0.04	0.4	0.0026	26.74	268
18	0.0011	0.10	1.0	0.0075	29.83	299
19	0.0033	0.32	3.2	0.0227	29.84	301

At all local sites for Scenario A operation, process contributions to nitrogen deposition are less than the applicable critical loads and as such are considered insignificant.

The determination of the process contribution to acid deposition at local sites is summarised in Table 4.6

Table 4.6 Acid deposition at local sites – Scenario A

Site	Process contribution to sulphur deposition		Total process contribution to acid deposition		Predicted environmental concentration	
	ugSO ₂ /m ² /a	kgS/ha/y	Keq/ha/y	%CL	Keq/ha/y	%CL
1	0.00012	0.018	0.028	0.9	2.15	66
2	0.00022	0.034	0.046	1.5	2.45	81
3	0.00003	0.005	0.009	0.3	2.13	66
4	0.00003	0.005	0.008	0.3	2.13	71
5	0.00005	0.008	0.013	0.4	2.41	80
6	0.00017	0.027	0.037	1.2	2.44	81
7	0.00009	0.014	0.020	0.7	2.30	76
8	0.00004	0.007	0.009	0.3	2.23	74
9	0.00002	0.003	0.005	0.2	2.15	71

10	0.00001	0.002	0.003	0.1	2.12	71
11	0.00001	0.002	0.004	0.1	2.12	71
12	0.00002	0.003	0.008	0.3	2.13	71
13	0.00003	0.005	0.012	0.4	2.13	66
14	0.00007	0.012	0.025	0.8	2.15	66
15	0.00006	0.009	0.020	0.6	2.14	66
16	0.00004	0.006	0.012	0.4	2.41	74
17	0.00001	0.002	0.003	0.1	2.12	71
18	0.00003	0.005	0.008	0.3	2.41	101
19	0.00011	0.017	0.024	0.8	2.42	80

At all local sites for Scenario A operation, process contributions to acid deposition are less than the applicable critical loads and as such are considered insignificant.

Scenario A, where the well site is undergoing construction, drilling and appraisal, together with full time production from the existing HH1 well, provides the worst case in terms of pollutant releases. Under these conditions process contributions at all local nature conservation sites are well below applicable critical levels and loads and as such are considered to be insignificant and posing no substantial risk to, and having no meaningful influence on, the attainment of critical levels and loads.

For completeness Tables 4.7, 4.8 and 4.9 provide the corresponding assessment of process contributions for Scenario B. In Scenario B, full time production from the existing HH1 well only is considered. These operations provide much lower pollutant release rates than Scenario A (see Table 2.1) and as such the impact at the local conservation sites is lower.

Table 4.7 Maximum process contributions of nitrogen oxides and sulphur dioxide at the local sites – Scenario B

Site	Maximum process contribution and predicted environmental concentration (% of critical level)					
	Nitrogen oxides annual mean		Nitrogen oxides daily mean		Sulphur dioxide annual mean	
	PC	PEC	PC	PEC	PC	PEC
1	1.4	51	6.1	21	0.030	9.1
2	2.9	54	5.7	21	0.056	21.5
3	0.5	50	2.3	17	0.009	9.1
4	0.4	48	2.2	17	0.008	9.1
5	0.7	51	2.2	17	0.014	21.4
6	2.3	53	3.5	19	0.040	21.4
7	1.1	53	2.1	18	0.020	10.5
8	0.6	50	1.4	16	0.011	10.5
9	0.3	48	1.8	16	0.005	8.5
10	0.2	47	0.7	15	0.003	9.1
11	0.2	47	1.1	15	0.003	9.1
12	0.3	46	1.2	15	0.005	9.1
13	0.4	47	1.7	16	0.007	9.1
14	1.4	56	2.4	19	0.019	9.1
15	1.1	56	2.1	18	0.016	9.1
16	0.7	61	1.7	20	0.010	21.4
17	0.1	47	1.1	15	0.002	9.1
18	0.6	70	1.2	22	0.009	21.4
19	1.5	52	3.0	18	0.027	21.4

Table 4.8 Nitrogen deposition at local sites – Scenario B

Site	Maximum process nitrogen contribution				Predicted environmental concentration	
	ugNO ₂ /m ² /a	kgN/ha/y	%CL	Keq/ha/y	kgN/ha/y	%CL
1	0.0009	0.09	0.9	0.0061	26.75	268
2	0.0018	0.17	1.7	0.0124	29.83	300
3	0.0003	0.03	0.3	0.0022	26.74	268
4	0.0003	0.03	0.3	0.0019	26.74	268
5	0.0005	0.05	0.5	0.0032	29.82	299
6	0.0014	0.14	1.4	0.0099	29.83	300
7	0.0007	0.07	0.7	0.0049	28.28	283
8	0.0004	0.03	0.3	0.0024	28.28	283
9	0.0002	0.02	0.2	0.0013	27.30	273
10	0.0001	0.01	0.1	0.0008	26.74	268
11	0.0001	0.01	0.1	0.0008	26.74	268
12	0.0002	0.02	0.2	0.0014	26.74	268
13	0.0002	0.02	0.2	0.0017	26.74	268
14	0.0009	0.08	0.8	0.0059	26.75	268
15	0.0007	0.07	0.7	0.0048	26.74	268

Table 4.8 continued

Site	Maximum process nitrogen contribution				Predicted environmental concentration	
	ugNO ₂ /m ² /a	kgN/ha/y	%CL	Keq/ha/y	kgN/ha/y	%CL
16	0.0005	0.04	0.4	0.0031	29.82	299
17	0.0001	0.01	0.1	0.0006	26.74	267
18	0.0004	0.03	0.3	0.0024	29.82	299
19	0.0009	0.09	0.9	0.0064	29.83	299

Table 4.9 Acid deposition at local sites – Scenario B

Site	Process contribution to sulphur deposition		Total process contribution to acid deposition		Predicted environmental concentration	
	ugSO ₂ /m ² /a	kgS/ha/y	Keq/ha/y	%CL	Keq/ha/y	%CL
1	0.00007	0.011	0.007	0.2	2.13	66
2	0.00014	0.021	0.014	0.5	2.41	80
3	0.00002	0.003	0.002	0.1	2.12	66
4	0.00002	0.003	0.002	0.1	2.12	71
5	0.00003	0.005	0.004	0.1	2.40	80
6	0.00010	0.015	0.011	0.4	2.41	80
7	0.00005	0.008	0.005	0.2	2.29	76
8	0.00003	0.004	0.003	0.1	2.22	74
9	0.00001	0.002	0.001	0.0	2.14	71
10	0.00001	0.001	0.001	0.0	2.12	71
11	0.00001	0.001	0.001	0.0	2.12	71
12	0.00001	0.002	0.001	0.0	2.12	71
13	0.00002	0.002	0.002	0.1	2.12	66
14	0.00005	0.007	0.006	0.2	2.13	66
15	0.00004	0.006	0.005	0.2	2.13	66
16	0.00002	0.004	0.003	0.1	2.40	74
17	0.00001	0.001	0.001	0.0	2.12	71
18	0.00002	0.003	0.003	0.1	2.40	101
19	0.00006	0.010	0.007	0.2	2.41	80

END