

FINAL REGISTRATION REPORT

Part B

Section 8

Environmental Fate

Detailed summary of the risk assessment

Product code: SHA 4100 A

Product name: HIFEN

Chemical active substance:

Thifensulfuron-methyl, 750 g/kg

Central Zone

Zonal Rapporteur Member State: Poland

CORE ASSESSMENT

Applicant: SHARDA Cropchem Ltd.

Submission date: September 2023

MS Finalisation date: February 2024; February 2025; March
2025; October 2025

Version history

When	What
September 2023	Submission by Applicant
February 2024	First assessment by zRMS
July 2024	Applicant Update
February 2025	The final Registration Report.
March 2025	Corrected of final Registration Report.
October 2025	Corrected II of final Registration Report.

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8 Fate and behaviour in the environment (KCP 9)

8.1 Critical GAP and overall conclusions

Table 8.1-1: Critical use pattern of the formulated product

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Use- No. *	Member state(s)	Crop and/or situ- ation (crop destination / purpose of crop)	F, Fn, Fpn G, Gpn or I **	Pests or Group of pests controlled (additionally: develop- mental stages of the pest or pest group)	Application				Application rate			PHI (days)	Remarks: e.g. g saf- ener/ syn- ergist per ha	Conclusion
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between ap- plications (days)	kg or L product/ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max			
Zonal uses (field or outdoor uses, certain types of protected crops)														
1	CEU	Winter cereals (wheat, barley, rye, oats, triti- cale)	F	Broadleaved weeds	Foliar Spray	BBCH 13-39 (Spring)	a) 1 b) 1	N.A	a) 0.04 b) 0.04	a) 0.03 b) 0.03	200-400	-		R risk mitiga- tion measures required

* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1

** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

Explanation for column 15 “Conclusion”

A	Safe use
R	Further refinement and/or risk mitigation measures required
C	To be confirmed by CMS
N	No safe use

Table 8.1-2: Assessed (critical) uses during approval of Thifensulfuron-methyl concerning the Section Environmental Fate

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Use- No. *	Member state(s)	Crop and/or situation (crop destination / purpose of crop)	F, Fn, G, Gn, Gpn or I **	Pests or Group of pests controlled (additionally: develop- mental stages of the pest or pest group)	Application				Application rate			PHI (days)	Remarks: e.g. g safener/ synergist per ha
					Method / Kind	Timing / Growth stage of crop & season	Max. number a) per use b) per crop/ season	Min. interval between ap- plications (days)	kg or L product/ha a) max. rate per appl. b) max. total rate per crop/season	g or kg as/ha a) max. rate per appl. b) max. total rate per crop/season	Water L/ha min/max		
1	EU	Winter cereals (wheat)	F	Broadleaf weeds	Tractor mounted hy- draulic/trailed boom sprayer, broadcast foliar application, ground directed spraying.	BBCH 12- 39	a) 1 b) 1	n.a.	-	a) 0.03 b) 0.03	200-400	n.a.	Fall application. Without surfactant.
2	EU	Winter cereals (wheat, barley, triticale, rye, oat)	F	Broadleaf weeds	Tractor mounted hy- draulic/trailed boom sprayer, broadcast foliar application, ground directed spraying.	BBCH 12- 39	a) 1 b) 1	n.a.	-	a) 0.0225- 0.0375 b) 0.0225- 0.0375	200-400	n.a.	Winter/spring application. With non-ionic surfactant (i.e. Trend® 90, 0.1% v/v)
3	EU	Spring cereals with and with- out underlay of grass +/- clo- ver/Lucerne (wheat, barley, oat, rye)	F	Broadleaf weeds	Tractor mounted hy- draulic/trailed boom sprayer, broadcast foliar application, ground directed spraying.	BBCH 12- 39	a) 1 b) 1	n.a.	-	a) 0.006-0.03 b) 0.006-0.03	100-400	Do not apply af- ter BBCH 39. PHI in days n/a, ex- cept 60 (DK at maturity) 14 (DK for for- age/silage before maturity)	Spring application. With and without non-ionic sur- factant (i.e. Trend® 90, 0.05% v/v). Max 15 g a.s./ha if grass underlay. Max 7.5 g a.s./ha if clo- ver/Lucerne underlay.
4	EU	Winter cereals	F	Broadleaf weeds	Tractor	BBCH 12- 39	a) 1 b) 1	n.a.	-	a) 0.006- 0.0375	100-400	Do not	Spring application. With and without non-ionic

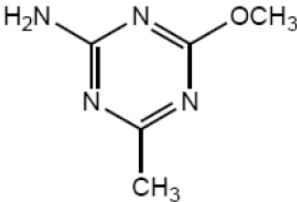
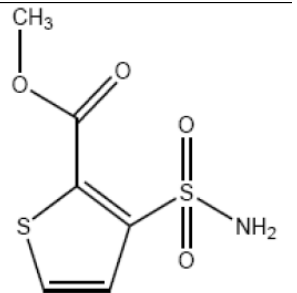
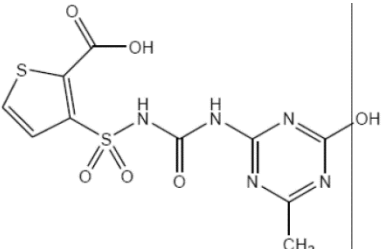
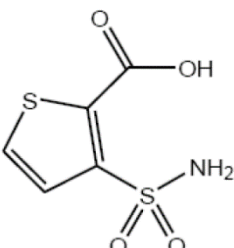
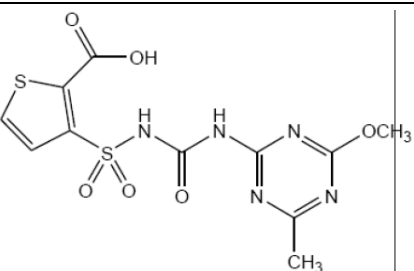
		with and without underlay of grass +/- clover/Lucerne (wheat, barley, oat, rye, triticale)			mounted hydraulic/trailed boom sprayer, broadcast foliar application, ground directed spraying.					b) 0.006-0.0375		apply after BBCH 39 PHI in days n/a, except 60 (DK at maturity)	surfactant (i.e. Trend® 90, 0.05-0.1% v/v). Max 15 g a.s./ha if grass underlay Max 7.5 g a.s./ha if clover/Lucerne underlay.
5	EU	Corn/maize	F	Broadleaf weeds	Tractor mounted hydraulic/trailed boom sprayer, broadcast foliar application, ground directed spraying.	BBCH 12-18	a) 1-2 b) 1-2	7/10	-	1 x 5.6-11.25 g a.s./ga or 5.6235 + 3.75 = 9.375 (total) g a.s./ha or 2 x 3.75 = 7.5 (total) g a.s./ha	150-500	n/a, except 60 (DK, SE, LI silage or feed of whole plant, cob kernels)	With and without non-ionic surfactant (i.e. Trend® 90, 0.05-0.1% v/v)
6	EU	Soybean	F	Broadleaf weeds	Tractor mounted hydraulic/trailed boom sprayer, broadcast foliar application, ground directed spraying.	BBCH 10-14	a) 1-2 b) 1-2	7	-	1 x 3.75-7.5 g a.s./ha or 2 x 3.75 = 7.5 (total) g a.s./ha	100-500	n.a.	With and without non-ionic surfactant (i.e. Trend® 90, 0.05-0.1% v/v)
7	All	Winter wheat, rye, triticale	F	Annual broadleaved weeds	Overall foliar spray	BBCH 13-39	a) 1 b) 1	-	-	a) 0.051 b) 0.051	100-400	NA	No PHI required
8	All	Spring wheat, winter barley, spring barley	F	Annual broadleaved weeds	Overall foliar spray	BBCH 13-39	a) 1 b) 1	-	-	a) 0.041 b) 0.041	100-400	NA	No PHI required

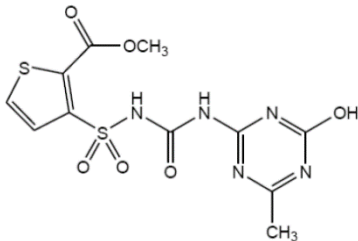
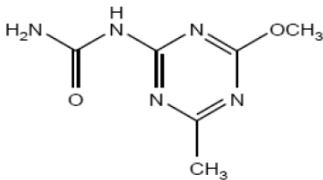
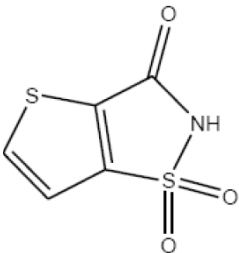
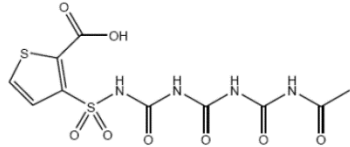
* Use number(s) in accordance with the list of all intended GAPs in Part B, Section 0 should be given in column 1

** F: professional field use, Fn: non-professional field use, Fpn: professional and non-professional field use, G: professional greenhouse use, Gn: non-professional greenhouse use, Gpn: professional and non-professional greenhouse use, I: indoor application

8.2 Metabolites considered in the assessment

Table 8.2-1: Metabolites of Thifensulfuron-methyl potentially relevant for exposure assessment

Metabolite	Molar mass	Chemical structure	Maximum observed occurrence in compartments	Exposure assessment required due to
IN-A4098	140.1		Soil: 18% Water: 20% Sediment: 7% ^a	PEC _{gw} : leaching potential to groundwater PEC _{soil} : if not covered by EU assessment PEC _{sw/sed} : if not covered by EU assessment
IN-A5546	221.2		Soil: 27.7% Whole system: 93.1%	PEC _{gw} : leaching potential to groundwater PEC _{soil} : if not covered by EU assessment PEC _{sw/sed} : if not covered by EU assessment
IN-JZ789	359.3		Soil: 10% Water: 21% Sediment: 4%	PEC _{gw} : leaching potential to groundwater PEC _{soil} : if not covered by EU assessment PEC _{sw/sed} : if not covered by EU assessment
IN-L9223	207.2		Soil: 19% Water: 39% Sediment: 8% ^a	PEC _{gw} : leaching potential to groundwater PEC _{soil} : if not covered by EU assessment PEC _{sw/sed} : if not covered by EU assessment
IN-L9225	373.4		Soil: 94% Water: 55% Sediment: 7% ^a	PEC _{gw} : leaching potential to groundwater PEC _{soil} : if not covered by EU assessment PEC _{sw/sed} : if not covered by EU assessment

Metabolite	Molar mass	Chemical structure	Maximum observed occurrence in compartments	Exposure assessment required due to
IN-L9226	373.4		Soil: 18.5% Water: 78% Sediment: 7.2%	PEC _{gw} : leaching potential to groundwater PEC _{soil} : if not covered by EU assessment PEC _{sw/sed} : if not covered by EU assessment
IN-V7160	183.2		Soil: 9.6% Water: 25% Sediment: 6%	PEC _{gw} : leaching potential to groundwater PEC _{soil} : if not covered by EU assessment PEC _{sw/sed} : if not covered by EU assessment
IN-W8268	189.2		Soil: 29.6%	PEC _{gw} : leaching potential to groundwater PEC _{soil} : if not covered by EU assessment PEC _{sw/sed} : if not covered by EU assessment
2-acid-3-triuret	378.3		Soil: 17%	PEC _{gw} : leaching potential to groundwater PEC _{soil} : if not covered by EU assessment PEC _{sw/sed} : if not covered by EU assessment

a: Not a major metabolite in sediment

b: Hydrolysis study, max 2% in water-sediment study

8.3 Rate of degradation in soil (KCP 9.1.1)

Studies on degradation in soil with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substance.

8.3.1 Aerobic degradation in soil (KCP 9.1.1.1)

8.3.1.1 Thifensulfuron-methyl and its metabolites

Table 8.3-1: Summary of aerobic degradation rates for Thifensulfuron-methyl - laboratory studies

Thifensulfuron-methyl, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa ¹	Chi2 (%)	Ki-netic model	Evaluated on EU level y/n/ Reference
Speyer 2.2	Loamy sand	5.7	22	40	1.7	5.7	2.0	3	SFO	EFSA Journal 2015;13(7):4201
Speyer 2.3	Loamy sand	7.0	22	40	2.6	8.6	3.1	4		
Longwood	Sandy loam	7.5	20	pF 2-2.5	0.99	3.29	0.99	3.74 ²		
Farditch	Loam	6.5	20	pF 2-2.5	1.12	3.72	1.12	6.78 ²		
Lockington	Sandy clay	5.5	20	pF 2-2.5	1.23	4.09	1.23	10.0 ²		
Kenslow	Loam	5.5	20	pF 2-2.5	0.85	2.82	0.85	5.66 ²		
Geometric mean (n=6)							1.39			
pH-dependency:							No			

1) DT₅₀ values only corrected for temperature since soil moisture estimated to be greater than pF2 based on measured MWHC from original study report and default values for pF2 from FOCUS groundwater report.

2) Worst-case figure from 2 radiolabels

Table 8.3-2: Summary of aerobic degradation rates for IN-L9225 - laboratory studies

IN-L9225, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Ki- netic model	Evaluated on EU level y/n/ Reference
Drummer	Silty clay loam	5.9	20	40	42.5	141.2	34.9	11	SFO	EFSA Journal 2015;13(7):4201
Glenville	Sandy loam	7.3	20	40	20.6	68.5	17.2	9		
Gross- Umstadt	Silt loam	7.5	20	40	154.4	513	119.9	5		
Longwoods thiophene	Sandy loam	7.3	20	pF2	74.4	247.2	74.4	8.87		
Longwoods triazine	Sandy loam	7.3	20	pF2	85.1	282.7	85.1	8.22		
Geometric mean Longwoods soils							79.6			

IN-L9225, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Ki-netic model	Evaluated on EU level y/n/ Reference
Farditch thiophene	Loam	5.9	20	pF2	20.7	68.8	20.7	10.9		
Farditch triazine	Loam	5.9	20	pF2	25.4	84.4	25.4	12.0		
Geometric mean Farditch soils							22.9			
Lockington thiophene	Sandy clay	5.5	20	pF2	17.5	58.1	17.5	11.2		
Lockington triazine	Sandy clay	5.5	20	pF2	20.3	67.4	20.3	10.0		
Geometric mean Lockington soils							18.8			
Kenslow thiophene	Loam	5.1	20	pF2	14.4	47.8	14.4	13.5		
Kenslow triazine	Loam	5.1	20	pF2	15.4	51.2	15.4	5.55		
Geometric mean Kenslow soils							14.9			
Geometric mean (n=7)							32.3			
pH-dependency:							No			

Table 8.3-3: Summary of aerobic degradation rates for IN-L9226 - laboratory studies

IN-L9226, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Ki-netic model	Evaluated on EU level y/n/ Reference
Drummer	Silty clay loam	5.9	20	40	2.0	6.6	1.6	5	SFO	EFSA Journal 2015;13(7):4201
Glenville	Sandy loam	7.3	20	40	2.9	9.6	2.4	13		
Gross-Umstadt	Silt loam	7.5	20	40	0.9	3.0	0.7	3		
LUFA 2.2	Loamy sand	5.5 (CaCl ₂)	20	45	0.6	2.0	0.6	18.5		
LUFA 2.3	Sandy loam	6.8 (CaCl ₂)	20	45	0.3	1.0	0.27	7.6		
LUFA 6S	Clay	7.1 (CaCl ₂)	20	45	3.3	11.0	1.63	12.5		
Geometric mean (n=6)							0.95			
pH-dependency:							No			

Table 8.3-4: Summary of aerobic degradation rates for IN-JZ789 - laboratory studies

IN-JZ789, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Longwoods thiophene	Sandy loam	7.3	20	pF2	362	1203	362	49.8	SFO	EFSA Journal 2015;13(7):4201
Longwoods triazine	Sandy loam	7.3	20	pF2	51.5	171	51.5	57.7		
Farditch thiophene	Loam	5.9	20	pF2	128	425	128	37.0		
Farditch triazine	Loam	5.9	20	pF2	1000	3322	> 1000	37.5		
Lockingtonm thiophene	Sandy clay	5.5	20	pF2	39.5	131	39.5	47.3		
Lockington triazine	Sandy clay	5.5	20	pF2	8.06	26.8	8.06	73.8		
Kenslow thiophene	Loam	5.1	20	pF2	1000	3322	> 1000	43.6		
Kenslow triazine	Loam	5.1	20	pF2	1000	3322	> 1000	69.6		
Geometric mean* (n=5)							60.0			
pH-dependency:							No			

* excluding soils with DT₅₀ > 1000

Table 8.3-5: Summary of aerobic degradation rates for 2-acid-3-triuret - laboratory studies

2-acid-3-triuret, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Longwoods thiophene	Sandy loam	7.3	20	pF2	122	405	122	61.1	SFO	EFSA Journal 2015;13(7):4201
Longwoods triazine	Sandy loam	7.3	20	pF2	57.9	192	57.9	43.6		
Farditch thiophene	Loam	5.9	20	pF2	46.1	153	46.1	34.3		
Farditch triazine	Loam	5.9	20	pF2	74.4	247	74.4	39.4		
Lockington thiophene	Sandy clay	5.5	20	pF2	38.4	128	38.4	35.8		
Lockington triazine	Sandy clay	5.5	20	pF2	115	382	115	36.3		
Kenslow thiophene	Loam	5.1	20	pF2	57.0	189	57.0	48.1		
Kenslow	Loam	5.1	20	pF2	132	439	132	53.0		

2-acid-3-triuret, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
triazine										
Geometric mean (n=8)							73.0			
pH-dependency:							No			

Table 8.3-6: Summary of aerobic degradation rates for IN-L9223 - laboratory studies

IN-L9223, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Ki- netic model	Evaluated on EU level y/n/ Reference
Longwoods thiophene	Sandy loam	7.3	20	pF2	1000	3322	> 1000	39.2	SFO	EFSA Journal 2015;13(7):4201
Farditch thiophene	Loam	5.9	20	pF2	107	355	107	27.7		
Lockington thiophene	Sandy clay	5.5	20	pF2	194	644	194	29.1		
Kenslow thiophene	Loam	5.1	20	pF20	272	904	272	23.9		
Geometric mean* (n=6)							178			
pH-dependency:							No			

* excluding soils with DT₅₀ > 1000

Table 8.3-7: Summary of aerobic degradation rates for IN-A4098 - laboratory studies

IN-A4098, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Keyport	Silt loam	4.3	25	70% FC	208	691	254	6.2	SFO	EFSA Journal 2015;13(7):4201
Honville	Loamy silt	6.7 (H ₂ O)	20	40	260.1 (K ₁ =0.01772 K ₂ =0.00266 Tb=25.9 s)	864	201.6	3.0	HS (DT ₅₀ calculated from slow phase)	
Gartenacker	Loam	6.9 (CaCl ₂)	20	pF2	102.2	340	102.2	3.5	SFO	
18 Acres	Sandy clay loam	5.0 (CaCl ₂)	20	pF2	249.4	828	249.4	3.2		
Krone	Silt loam	4.9 (CaCl ₂)	20	pF2	190.8	634	190.8	3.7		
Soil 2.2	Loamy sand	5.7 (H ₂ O)	20	45	67.3	224	67.3	5.68		

IN-A4098, Laboratory studies, aerobic conditions											
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference	
Soil 3A	Sandy loam	7.3 (H ₂ O)	20	45	188.4	626	175.7	5.64			
Soil 6S	Clay loam	7.1 (H ₂ O)	20	45	333.2	1107	230.1	1.00			
Arrow	Sandy loam	5.7	20	50	44.7 (K ₁ =0, fixed lag phase K ₂ =0.03082 Tb=22.25d)	97	22.5	14	HS (DT ₅₀ calculated from slow phase)		
Speyer 2.1	Sand	5.5	20	pF2	112.5	374	112.5	2.9	SFO		
Soil 115	Clay loam	8.6	20	pF2	175.2	582	175.2	3.1			
Soil 243	Sandy loam	5.6	20	pF2	96.4	320.2	96.4	6.2			
Longwoods triazine	Sandy loam	7.3	20	pF2	1000	3322	1000	26.6			
Farditch triazine	Loam	5.9	20	pF2	118	392	118	27.2			
Lockington triazine	Sandy clay	5.5	20	pF2	562	1867	562	21.5			
Kenslow triazine	Loam	5.1	20	pF2	208	691	208	8.59			
Geometric mean (n=16)							167.9				
pH-dependency:							No				

Table 8.3-8: Summary of aerobic degradation rates for IN-A5546 - laboratory studies

IN-A5546, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Ki- netic model	Evaluated on EU level y/n/ Reference
Sassafras	Loamy sand	5.3	20	pF2	< 3	-	-	-	-	EFSA Journal 2015;13(7):4201
Tama	Silty clay loam	6.1	20	pF2	< 3	-	-	-	-	
Lleida	Silty clay	7.9	20	pF2	< 3	-	-	-	-	
Speyer 2.2	Loamy sand	6.3	20	pF2	< 3	-	-	-	-	
Nambshiem	Sandy loam	7.7	20	pF2	< 3	-	-	-	-	
pH-dependency:					No					

* A DT₅₀ figure of **3 days** was used as a conservative figure for FOCUS modeling. This was because the first sample point after 0 was 3 days, and IN-A5546 was not observed at the 3-d sampling time. DT₉₀ < 10 d

Table 8.3-9: Summary of aerobic degradation rates for IN-V7160 - laboratory studies

IN-V7160, Laboratory studies, aerobic conditions											
Soil name	Soil type	pH (CaCl ₂)	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa ^a	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference	
Mattapex	Sandy loam	4.35	20	40	9.8	33	9.0	11	SFO	EFSA Journal 2015;13(7):4201	
Lleida	Silty clay	7.50	20	40	6.6	22	5.6	5			
Nambsheim	Sandy loam	7.01	20	40	3.3	11	3.3	2			
Goch	Silt loam	5.13	20	40	16.1 M0=95.3 K1=0.008 K2=0.175 g=0.5	204.1	71.6 (based on slow phase rate constat)	3	DFOP		
Suchozebry	Sandy loam	5.04	20	40	24.8 M0=94.2 K1=0.003 K2=0.097 g=0.5	542.8	231 (based on slow phase rate constant)	2			
Geometric mean (n=5)							19.4				
pH-dependency:							No				

a: moisture correction was performed based on measured data for both study and reference conditions.

Table 8.3-10: Summary of aerobic degradation rates for IN-W8268 - laboratory studies

IN-W8268, Laboratory studies, aerobic conditions										
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	DT50 (d) 20°C pF2/10kPa	Chi2 (%)	Ki-netic model	Evaluated on EU level y/n/ Reference
Drummer	Silty clay loam	7.7	20	40-50	59.0	196	59.0	2	SFO	EFSA Journal 2015;13(7):4201
Glenville	Sandy loam	5.7	20	40-50	64.2	213.3	61.1	4		
Gross-Umstadt	Silt loam	7.8	20	40-50	48.1	159.8	43.5	4		
LUFA 2.2	Loamy sand	5.5 (CaCl ₂)	20	45	2.6	8.6	2.6	14		
LUFA 2.3	Sandy loam	6.8 (CaCl ₂)	20	45	9.7	32.2	8.6	7.8		
LUFA 6S	Clay	7.1 (CaCl ₂)	20	45	24.5	81.4	12.1	8.9		
Geometric mean (n=6)							18.7			
pH-dependency:							No			

8.3.2 Anaerobic degradation in soil (KCP 9.1.1.1)

Table 8.3-11: Summary of anaerobic degradation rates for Thifensulfuron-methyl - laboratory studies

Thifensulfuron-methyl, Laboratory studies, anaerobic conditions									
Soil name	Soil type	pH	t.oC	MWHC %	DT50 (d)	DT90 (d)	Chi2 (%)	Kinetic model	Evaluated on EU level y/n/ Reference
Keyport	Silt loam	7.2	25	75	5	16.6		-	EFSA Journal 2015;13(7):4201
Farditch thiophene (complete dataset)	Loam	6.0	20	flooded	0.6	4.5	1.5	Hockey-stick	
Farditch triazine (complete dataset)	Loam	6.0	20	flooded	0.7	8.8	3.9	Hockey-stick (slow phase)	
Farditch thiophene (anaerobic slow phase HS)	Loam	6.0	20	flooded	15.4	51.2	-		
Farditch triazine (anaerobic slow phase HS)	Loam	6.0	20	flooded	4.7	15.6	-		

8.4 Field studies (KCP 9.1.1.2)

No field studies were conducted for the regulatory assessment.

8.4.1 Soil accumulation testing (KCP 9.1.1.2.2)

Not relevant.

8.5 Mobility in soil (KCP 9.1.2)

Studies on mobility in soil with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substance.

Table 8.5-1: Summary of soil adsorption/desorption for Thifensulfuron-methyl

Thifensulfuron-methyl							
Soil name	Soil type	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Sassafras	Loamy sand	0.81	4.8	0.6660	82	0.9023	EFSA Journal 2015;13(7):4201
Lleida	Clay	1.74	7.6	0.1551	9	0.9826	
Drummer	Clay loam	2.96	5.7	2.5468	86	0.8211	
Gross-Umstadt	Loam	1.39	6.6	0.2679	19	0.9599	
Nambsheim	Sandy loam	2.03	7.3	0.2164	11	0.8389	
Longwoods	Sandy loam	1.3	7.3	0.08	6.0	0.967	
Farditch	Loam	3.5	5.9	0.22	6.2	0.952	

Thifensulfuron-methyl							
Soil name	Soil type	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Kenslow	Loam	3.9	5.1	0.33	8.4	0.949	
Lockington	Sandy clay	2.8	5.5	0.09	3.1	1.012	
Arithmetic mean (n=9)					-	0.932	
Geometric mean (n=9)					13.3	-	
pH-dependency					No		

Table 8.5-2: Summary of soil adsorption/desorption for IN-A4098

IN-A4098							
Soil Name	Soil Type	OC (%)	pH	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Gross-Umstadt	Silt loam	1.2	7.7	0.2	18.8	1.05	EFSA Journal 2015;13(7):4201
Arrow	Sandy loam	2.3	5.7	0.7	29.7	0.94	
Mattapex	Silt loam	2.6	6.4	0.4	16.7	0.96	
Matapeake	Silt loam	1.1	85.3	2.36	214.2	0.841	
Sassafras	Sand	0.46	6.3	0.621	133.8	0.784	
Drummer	Silty clay loam	3.02	5.7	6.80	225.5	0.841	
Myaka	Sand	0.58	6.2	0.264	45.52	0.873	
Honville (Chateaudun)	Silt loam	0.91	6.7	1.57	172	0.8351	
Fayette county, Kentucky USA	Agricultural sand	0.35	7.9	0.2326	66.5	0.8702	
Fayette county, Kentucky USA	Sandy loam	0.99	7.8	0.57	58.2	0.9024	
Fayette county, Kentucky USA	Silt loam	1.74	6.5	0.9612	55.2	0.8474	
Fayette county, Kentucky USA	Silty clay loam	0.70	6.9	1.201	171.6	0.8230	
SLS	Silt loam	2.08	7.0	0.44	21.3	0.873	
LS2.2	Loamy sand	1.95	6.0	0.30	15.4	0.909	
SLV	Sandy loam	0.43	6.0	0.32	74.4	0.840	
Laacher Hof Wurmweiese	Loam	1.8	5.3	1.321	73.4	0.9183	
Hoefchen Am Hohenseh 4a	Silt loam	2.4	6.6	0.481	20.0	0.9755	
Les Cayades	Clay loam	0.9	7.6	0.561	62.3	0.917	
Guadalupe	Sandy loam	0.7	6.7	0.675	96.5	0.9498	

IN-A4098							
Soil Name	Soil Type	OC (%)	pH	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Springfield	Silt loam	1.7	6.6	3.147	185.1	0.9021	
2.2	Silty sand	1.97	5.4	0.3728	18.92	0.640	
3A	Sandy loam	2.42	7.3	0.4350	17.97	0.759	
6S	Clay loam	1.84	6.9	0.0543	2.95	1.422	
Speyer 2.1	-	0.56	6.0	0.2025	36	0.92	
Standard soil no. 115	-	1.7	7.4	0.6255	37	0.89	
Standard soil no. 164	-	3.0	6.5	0.645	22	0.92	
Standard soil no. 243	-	1.1	4.3	0.337	31	0.91	
Arithmetic mean (n=27)					-	0.90	
Geometric mean (n=27)					45.6	-	
pH-dependency					No		

Table 8.5-3: Summary of soil adsorption/desorption for IN-L9223

IN-L9223							
Soil Name	Soil Type	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Drummer	Silt loam	3.2	6.4	0.2595	8	0.9232	EFSA Journal 2015;13(7):4201
Longwood	Sandy loam	1.3	7.9 (H ₂ O)	0.03	2.03	1.4090	
Chelmorton	Clay loam	3.3	7.3 (H ₂ O)	0.11	3.27	1.0931	
Lockington	Clay loam	2.5	6.5 (H ₂ O)	0.07	2.97	1.204	
Arithmetic mean (n=4)					-	1.157	
Geometric mean (n=4)					3.54	-	
pH-dependency					No		

Table 8.5-4: Summary of soil adsorption/desorption for IN-L9225

IN-L9225							
Soil Name	Soil Type	OC (%)	pH (H ₂ O)	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Arrow	Sandy loam	2.3	5.7	0.30	13.1	0.74	EFSA Journal 2015;13(7):4201
Gross-Umstadt	Silt loam	1.2	7.7	0.083	6.9	0.62	
Mattapex	Silt loam	2.6	6.4	0.35	13.5	0.76	
LUFA 2.2	Loamy sand	1.87	5.5 (CaCl ₂)	0.435	23 ^b	-	

IN-L9225							
Soil Name	Soil Type	OC (%)	pH (H ₂ O)	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
LUFA 2.3	Sandy loam	0.94	6.8 (CaCl ₂)	0.318	34 ^b	-	
LUFA 6S	Clay	1.64	7.1 (CaCl ₂)	0.481	29 ^b	-	
Arithmetic mean (n=6)					-	0.850 ^a	
Geometric mean (n=6)					17.4	-	
pH-dependency					No		

a: in deriving an arithmetic mean, a default 1/n value of 1.0 was assumed for the three soils where no Freundlich isotherm was determined because a single concentration had been tested.

b: as only one concentration was tested this value if a Koc not Kfoc

Table 8.5-5: Summary of soil adsorption/desorption for IN-L9226

IN-L9226							
Soil Name	Soil Type	OC (%)	pH (H ₂ O)	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Arrow	Sandy loam	2.3	5.7	0.8	34	0.80	EFSA Journal 2015;13(7):4201
Gross-Umstadt	Silt loam	1.2	7.7	2.4	199	0.81	
Mattapex	Silt loam	2.6	6.4	2.6	99	0.79	
LUFA 2.2	Loamy sand	1.87	5.5 (CaCl ₂)	1.605	86 ^b	-	
LUFA 2.3	Sandy loam	0.94	6.8 (CaCl ₂)	1.886	201 ^b	-	
LUFA 6S	Clay	1.64	7.1 (CaCl ₂)	2.193	134 ^b	-	
Arithmetic mean (n=6)					-	0.900 ^a	
Geometric mean (n=6)					107.6	-	
pH-dependency					No		

a: in deriving an arithmetic mean, a default 1/n value of 1.0 was assumed for the three soils where no Freundlich isotherm was determined because a single concentration had been tested.

b: as only one concentration was tested this value if a Koc not Kfoc

Table 8.5-6: Summary of soil adsorption/desorption for IN-V7160

IN-V7160								
Soil Name	Soil Type	OC (%)	pH	Kf (mL/g)	Kfom (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Stark County (Tama)	Silty clay loam	3.1	6.3	5.97	113	194	0.9297	EFSA Journal 2015;13(7):4201
Kent County (Sassafras #16)	Loamy sand	1.4	6.3	0.969	40.4	69.4	0.9021	
Lleida	Silty clay	1.8	7.5	1.51	48.8	84.0	0.9364	
Nambsheim	Sandy loam	1.6	7.0	0.908	33.6	57.9	0.9290	
Suchozebry	Sandy loam	0.76	5.0	1.24	95.6	164	0.8686	

IN-V7160								
Soil Name	Soil Type	OC (%)	pH	Kf (mL/g)	Kfom (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Arithmetic mean (n=5)						-	0.913	
Geometric mean (n=5)						101.4	-	
pH-dependency						No		

Table 8.5-7: Summary of soil adsorption/desorption for IN-W8268

IN-W8268							
Soil Name	Soil Type	OC (%)	pH (H ₂ O)	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Arrow	Sandy loam	2.3	5.7	0.10	3.6	1.10	EFSA Journal 2015;13(7):4201
Gross-Umstadt	Silt loam	1.2	7.7	0.05	4.0	1.68	
Mattapex	Silt loam	2.6	6.4	0.10	2.6	1.17	
LUFA 2.2	Loamy sand	1.87	5.5 (CaCl ₂)	0.1652	9 ^b	-	
LUFA 2.3	Sandy loam	0.94	6.8 (CaCl ₂)	0.0947	10 ^b	-	
LUFA 6S	Clay	1.64	7.1 (CaCl ₂)	0.2536	15 ^b	-	
Arithmetic mean (n=6)					-	1.160 ^a	
Geometric mean (n=6)					6.1	-	
pH-dependency					No		

a: in deriving an arithmetic mean, a default 1/n value of 1.0 was assumed for the three soils where no Freundlich isotherm was determined because a single concentration had been tested.

b: as only one concentration was tested this value if a Koc not Kfoc

Table 8.5-8: Summary of soil adsorption/desorption for IN-JZ789

IN-JZ789							
Soil Name	Soil Type	OC (%)	pH (CaCl ₂)	Kd (mL/g)	Koc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Drummer	Clay loam	3.3	5.9	0.89	26.95	-	EFSA Journal 2015;13(7):4201
Gross-Umstadt	Loam	1.2	6.4	0.17	13.96	-	
Nambsheim	Sandy loam	1.3	7.2	0.18	13.61	-	
Lleida	Clay	2.0	7.8	0.47	23.27	-	
Sassafras	Sandy loam	1.6	4.7	0.24	15.18	-	
LUFA 2.2	Loamy sand	1.87	5.5	0.759	41	-	
LUFA 2.3	Sandy loam	0.94	6.8	0.546	58	-	
LUFA 6S	Clay	1.64	7.1	0.901	57	-	
Arithmetic mean (n=8)					-	1.000*	
Geometric mean (n=8)					26.5	-	

IN-JZ789							
Soil Name	Soil Type	OC (%)	pH (CaCl ₂)	Kd (mL/g)	Koc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
pH-dependency					No		

*: The UK RMS considered it appropriate since no attempt to measure the Freundlich isotherm was attempted, to use a default 1/n of 1.0

Table 8.5-9: Summary of soil adsorption/desorption for 2-acid-3-triuret

2-acid-3-triuret							
Soil Name	Soil Type	OC (%)	pH (CaCl ₂)	Kd (mL/g)	Koc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
LUFA 2.2	Loamy sand	1.77	5.5	4.130	230	-	EFSA Journal 2015;13(7):4201
LUFA 2.3	Sandy loam	0.94	6.8	5.285	562	-	
LUFA 2.4	Loam	2.26	7.2	17.620	780	-	
Arithmetic mean (n=3)					-	1.000*	
Geometric mean (n=3)					465.4		
pH-dependency					No		

*: The UK RMS considered it appropriate since no attempt to measure the Freundlich isotherm was attempted, to use a default 1/n of 1.0

Table 8.5-10: Summary of soil adsorption/desorption for IN-A5546

IN-A5546							
Soil Name	Soil Type	OC (%)	pH (CaCl ₂)	Kf (mL/g)	Kfoc (mL/g)	1/n	Evaluated on EU level y/n/ Reference
Sassafras	Sand	0.81	4.8	0.2720	34	0.8767	EFSA Journal 2015;13(7):4201
Drummer	Clay loam	2.96	5.7	2.5107	85	0.9004	
Gross-Umstadt	Loam	1.28	6.8	0.3643	28	0.9521	
Arithmetic mean (n=3)					-	0.9100	
Geometric mean (n=3)					43.3	-	
pH-dependency					No		

The transient metabolite IN-A5546 was not stable when tested in soils with pH of 7.4 and 7.7. The values shown above relate to acidic/neutral pH only. Due to the instability under such conditions, the absence of sorption data from alkali soil conditions in this case is not considered to have any impact on the groundwater exposure assessment.

8.5.1 Column leaching (KCP 9.1.2.1)

No reliable information provided.

8.5.2 Lysimeter studies (KCP 9.1.2.2)

No reliable information provided.

8.5.3 Field leaching studies (KCP 9.1.2.3)

No reliable information provided.

8.6 Degradation in the water/sediment systems (KCP 9.2, KCP 9.2.1, KCP 9.2.2, KCP 9.2.3)

Studies on degradation in water/sediment systems with the formulation were not performed, since it is possible to extrapolate from data obtained with the active substance.

Table 8.6-1: Summary of degradation in water/sediment of Thifensulfuron-methyl

Thifensulfuron-methyl Distribution (max. water > 99% at 0 d, max. sediment 1.08% after 31 days)								
Water/sediment system	pH water/sed.	DegT50 whole syst. (d)	St. Chi ²	DissT50 water (d)	St. Chi ²	DissT50 sed. (d)	Method of calc.	Evaluated on EU level y/n/ Reference
Town park pond	7.8/7.2	18.2	3.9	18.2	3.9	1000	SFO	EFSA Journal 2015;13(7):4201
Red Oak stream	7.6/7.1	26.1	3.2	26.1	3.2	1000		
Swiss lake	7.4/6.0	32.3	4.3	32.0	4.3	1000		
Calwich Abbey Lake	8.3/7.4	17.6	4.5	17.3	4.6	1000		
Geometric mean (n=4)		22.8		-*		1000		

*: For FOCUSsw modelling the whole system geomean DT₅₀ (22.8 days) was used for the water phase and a default 1000 d DT₅₀ was used for sediment.

Table 8.6-2: Summary of observed metabolites

IN-L9226 Water/sediment system	Max. water 78%, max. sediment 7.2%	EFSA Journal 2015;13(7):4201
IN-JZ789 Water/sediment system	Max. water 21% after 125d, max. sediment 4%	
IN-L9223 Water/sediment system	Max. water 39% after 182d, max. sediment 8%	
IN-V7160 Water/sediment system	Max. water 25% after 182d, max. sediment 6%	
IN-A4098 Water/sediment system	Max. water 20%, max. sediment 7%	
IN-L9225 Water/sediment system	Max. water 55%, max. sediment 7%	

8.7 Predicted Environmental Concentrations in soil (PEC_{soil}) (KCP 9.1.3)

8.7.1 Justification for new endpoints

Not relevant as there is no deviation to EU agreed endpoints.

8.7.2 Active substance and relevant metabolites

Table 8.7-1: Input parameters related to application for PEC_{soil} calculations

Use No.	1
Crop	Winter cereals (wheat, barley, rye, oats, triticale)
Application rate (g as/ha)	Thifensulfuron-methyl: 30
Number of applications/interval	1/-
Crop interception (%)	0%
Depth of soil layer (relevant for plateau concentration) (cm)	20 cm (tillage)

Table 8.7-2: Input parameter for active substance and relevant metabolites for PEC_{soil} calculation

Compound	Molecular weight (g/mol)	Max. occurrence (%)	DT ₅₀ (d)	Value in accordance to EU endpoint y/n/ Reference
Thifensulfuron-methyl	387.4	-	3.1 (worst-case from lab.studies)	EFSA Journal 2015;13(7):4201 and DAR, 2014
IN-L9225	373.4	94%	154 4 (worst-case from lab. studies)	
IN-L9226	373.4	18.5%	3.3 (worst-case from lab. studies)	
IN-JZ789	359.3	10%	1000 (worst-case from lab. studies)	
2-acid-3-triuret	378.3	17%	132 (worst-case from lab. studies)	
IN-L9223	207.2	19%	1000 (worst-case from lab. studies)	
IN-A4098	140.1	32.3%	1000 (worst-case from lab. studies)	
IN-A5546	221.2	27.7%	3 (conservative figure)	
IN-V7160	183.2	9.6%	231 (worst-case from lab. studies)	
IN-W8268	189.2	29.6%	64.2 (worst-case from lab. studies)	

8.7.2.1 Thifensulfuron-methyl and its metabolites

Table 8.7-3: PEC_{soil} for Thifensulfuron-methyl on winter cereals

PEC_{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.040	-
Short term	24h	0.032	0.036
	2d	0.026	0.032
	4d	0.016	0.026
Long term	7d	0.008	0.020
	14d	0.002	0.012
	21d	< 0.001	0.008
	28d	< 0.001	0.006
	50d	< 0.001	0.004
	100d	< 0.001	0.002
Plateau concentration (20 cm) after year		-	
$PEC_{accumulation}$ ($PEC_{act} + PEC_{soil\ plateau}$)		-	

PEC_{soil} of metabolites

PEC_{soil} values for the metabolites were determined as for the parent with an application rate corrected taking into account the molecular weights (MW) and the maximum occurrence of the metabolite in soil as following:

$$\text{Application rate}_{\text{metabolite}} = (\text{MW}_{\text{metabolite}} / \text{MW}_{\text{parent}}) \times (\% \text{ maximum occurrence} / 100) \times \text{application rate}_{\text{parent}}$$

The corresponding application rates for each metabolite are summarized in the table below.

Table 8.7-4: Application rates for each relevant metabolite

Active substance	Metabolite	Application rate of the parent (g/ha)	MW parent	MW metabolite	Maximum occurrence in soil (%)	Corrected application rate (g/ha)
Thifensulfuron-methyl	IN-L9225	30	387.4	373.4	94	27.18
	IN-L9226			373.4	18.5	5.35
	IN-JZ789			359.3	10	2.78
	2-acid-3-triuret			378.3	17	4.98
	IN-L9223			207.2	19	3.05
	IN-A4098			140.1	32.3	3.50

	IN-A5546			221.2	27.7	4.74
	IN-V7160			183.2	9.6	1.36
	IN-W8268			189.2	29.6	4.34

Table 8.7-5: PEC_{soil} for metabolite IN-L9225 on winter cereals

PEC_{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.036	-
Short term	24h	0.036	0.036
	2d	0.036	0.036
	4d	0.036	0.036
Long term	7d	0.035	0.036
	14d	0.034	0.035
	21d	0.033	0.035
	28d	0.032	0.034
	50d	0.029	0.032
	100d	0.023	0.029
Plateau concentration (20 cm) after year 2		0.002	-
$PEC_{accumulation}$ ($PEC_{act} + PEC_{soil \text{ plateau}}$)		0.038	-

Table 8.7-6: PEC_{soil} for metabolite IN-L9226 on winter cereals

PEC_{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.007	-
Short term	24h	0.006	0.006
	2d	0.005	0.006
	4d	0.003	0.005
Long term	7d	0.002	0.004
	14d	<0.001	0.002
	21d	<0.001	0.002
	28d	<0.001	0.001
	50d	<0.001	0.001
	100d	<0.001	<0.001
Plateau concentration (20 cm) after year 1		-	-
$PEC_{accumulation}$		-	-

(PEC _{act} + PEC _{soil plateau})		
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Table 8.7-7: PEC_{soil} for metabolite IN-JZ789 on winter cereals

PEC _{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.004	-
Short term	24h	0.004	0.004
	2d	0.004	0.004
	4d	0.004	0.004
Long term	7d	0.004	0.004
	14d	0.004	0.004
	21d	0.004	0.004
	28d	0.004	0.004
	50d	0.004	0.004
	100d	0.003	0.004
Plateau concentration (20 cm) after year 7		0.003	-
PEC _{accumulation} (PEC _{act} + PEC _{soil plateau})		0.007	-

Table 8.7-8: PEC_{soil} for metabolite 2-acid-3-triuret on winter cereals

PEC _{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.007	-
Short term	24h	0.007	0.007
	2d	0.007	0.007
	4d	0.007	0.007
Long term	7d	0.006	0.007
	14d	0.006	0.006
	21d	0.006	0.006
	28d	0.006	0.006
	50d	0.005	0.006
	100d	0.004	0.005
Plateau concentration (20 cm) after year 1		<0.001	-
PEC _{accumulation} (PEC _{act} + PEC _{soil plateau})		0.007	-

Table 8.7-9: PEC_{soil} for metabolite IN-L9223 on winter cereals

PEC_{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.004	-
Short term	24h	0.004	0.004
	2d	0.004	0.004
	4d	0.004	0.004
Long term	7d	0.004	0.004
	14d	0.004	0.004
	21d	0.004	0.004
	28d	0.004	0.004
	50d	0.004	0.004
	100d	0.004	0.004
Plateau concentration (20 cm) after year 20		0.004	-
$PEC_{accumulation}$ ($PEC_{act} + PEC_{soil\ plateau}$)		0.008	-

Table 8.7-10: PEC_{soil} for metabolite IN-A4098 on winter cereals

PEC_{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.005	-
Short term	24h	0.005	0.005
	2d	0.005	0.005
	4d	0.005	0.005
Long term	7d	0.005	0.005
	14d	0.005	0.005
	21d	0.005	0.005
	28d	0.005	0.005
	50d	0.005	0.005
	100d	0.004	0.005
Plateau concentration (20 cm) after year 9		0.004	-
$PEC_{accumulation}$ ($PEC_{act} + PEC_{soil\ plateau}$)		0.011	-

Table 8.7-11: PEC_{soil} for metabolite IN- A5546 on winter cereals

PEC _{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.006	-
Short term	24h	0.005	0.006
	2d	0.004	0.005
	4d	0.003	0.004
Long term	7d	0.001	0.003
	14d	<0.001	0.002
	21d	<0.001	0.001
	28d	<0.001	0.001
	50d	<0.001	0.001
	100d	<0.001	<0.001
Plateau concentration (20 cm) after year -		-	-
PEC _{accumulation} (PEC _{act} + PEC _{soil plateau})		-	-

Table 8.7-12: PEC_{soil} for metabolite IN – V7160 on winter cereals

PEC _{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.006	-
Short term	24h	0.006	0.006
	2d	0.006	0.006
	4d	0.006	0.006
Long term	7d	0.005	0.006
	14d	0.005	0.005
	21d	0.005	0.005
	28d	0.004	0.005
	50d	0.003	0.004
	100d	0.002	0.004
Plateau concentration (20 cm) after year 1		<0.001	-
PEC _{accumulation} (PEC _{act} + PEC _{soil plateau})		0.006	-

Table 8.7-13: PEC_{soil} for metabolite IN - W8268 on winter cereals

PEC _{soil} (mg/kg)		Single application	
		Actual	TWA
Initial		0.002	-
Short term	24h	0.002	0.002
	2d	0.002	0.002
	4d	0.002	0.002
Long term	7d	0.002	0.002
	14d	0.002	0.002
	21d	0.002	0.002
	28d	0.002	0.002
	50d	0.002	0.002
	100d	0.001	0.002
Plateau concentration (20 cm) after year 1		<0.001	-
PEC _{accumulation} (PEC _{act} + PEC _{soil plateau})		0.002	-

8.7.2.2 PEC_{soil} of HIFEN

Since HIFEN is rapidly broken down into its constituent parts on contact with soil and/or crop material, it is appropriate to calculate the PECs following a single application only, using the following equation:

$$PEC_S(mg/kg) = \frac{\text{Application rate (g/ha)} \times (1-F)}{100 \times \text{Soil depth (cm)} \times \text{Soil dry bulk density (g/cm}^3\text{)}}$$

Table 8.7-4: PEC_{soil} for HIFEN on winter cereals

Preparation	Application rate (g/ha)	Crop interception (%)	PEC _{act} (mg/kg)
HIFEN	40	0%	0.053

zRMS comments:

The calculations PEC s cover proposed using of Hifen in GAP.

Peer- reviewed endpoints for thifensulfuron-methyl and its metabolites have been presented in EFSA conclusion (EFSA Journal 2015;13(7) :4201). The PECs for metabolites is presented in Tables: 8.7.5 - 8.7.13 and for formulation in 8.7.4.

The acceptable predicted environmental concentrations of thifensulfuron methyl and its metabolites and formulation Hifen in soil are appropriate to be used for the subsequent risk assessment.

8.8 Predicted Environmental Concentrations in groundwater (PEC_{gw}) (KCP 9.2.4)

8.8.1 Justification for new endpoints

Not relevant as there is no deviation to EU agreed endpoints.

8.8.2 Active substance and relevant metabolites (KCP 9.2.4.1)

Table 8.8-1: Input parameters related to application for PEC_{gw} calculations

Use No.	1
Crop	Winter cereals (wheat, barley, rye, oats, triticale)
Application rate (g as/ha)	Thifensulfuron-methyl: 30
Number of applications/interval (d)	1/-
Crop interception (%)	0
Frequency of application	Annual
Models used for calculation	FOCUS PEARL v5.5.5, FOCUS PELMO v6.6.4

Table 8.8-2: Application dates used for groundwater risk assessment

Scenario	Application dates (absolute)
	End of winter*
Châteaudun	24/02
Hamburg	24/02
Jokioinen	04/05
Kremsmünster	24/02
Okehampton	01/03
Piacenza	06/03
Porto	14/02
Sevilla	15/02
Thiva	15/02

*Application dates according to EFSA Journal 2016;14(4):4453

8.8.2.1 Thifensulfuron-methyl and its metabolites

Table 8.8-3: Input parameters related to active substance Thifensulfuron-methyl and metabolites for PEC_{gw} calculations

Compound	Thifensulfuron-methyl	IN-L9225	IN-JZ789	2-acid-3-tri-uret	IN-L9223	IN-A4098	IN-V7160	IN-W8268	IN-A5546	Value in accordance with EU endpoint y/n/ Reference*
Molecular weight (g/mol)	387.4	373.4	359.3	378.3	207.2	140.1	183.2	189.2	221.2	EFSA Journal 2015;13(7):4201 and DAR, 2014
Water solubility (mg/L):	2240 ^a									
Saturated vapour pressure (Pa):	5.2 x 10 ⁻⁹ ^b at 20°C									
DT ₅₀ in soil (d)	1.39 (geomean, normalisation to 10 kPa, 20 °C with Q ₁₀ of 2.58, n=6)	32.3 (geomean, normalisation to 10 kPa, 20°C with Q ₁₀ of 2.58, n=7)	60.0 (geomean, normalisation to 10 kPa, 20°C with Q ₁₀ of 2.58, n=5)	73.0 ((geomean, normalisation to 10 kPa, 20°C with Q ₁₀ of 2.58, n=8)	178 (geomean, normalisation to 10 kPa, 20°C with Q ₁₀ of 2.58, n=6)	167.9 (geomean, normalisation to 10 kPa, 20°C with Q ₁₀ of 2.58, n=7)	19.4 (geomean, normalisation to 10 kPa, 20°C with Q ₁₀ of 2.58, n=5)	18.7 (geomean, normalisation to 10 kPa, 20°C with Q ₁₀ of 2.58, n=6)	3.0 (conservative figure)	
K _{foc} (mL/g)/K _{fom}	13.3 (geomean, n=9) / 7.71	17.4 (geomean, n=6) / 10.09	26.5 (geomean, n=8) / 15.37	465.4 (geomean, n=3) / 269.95	3.54 (geomean, n=4) / 2.05	45.6 (geompean, n=27) / 26.45	101.4 (geomean, n=5) / 58.82	6.1 (geomean, n=6) / 3.54	43.3 (geomean, n=3) / 25.12	
1/n	0.932 (arithmetic mean, n=9)	0.850 (arithmetic mean, n=6)	1.000 (default)		1.157 (arithmetic mean, n=4)	0.900 (arithmetic mean, n=27)	0.913(arithmetic mean, n=5)	1.160 (arithmetic mean, n=6)	0.910 (arithmetic mean, n=3)	
Plant uptake factor	0									
Formation		0.95 from	0.26 from	0.22 from	0.3 from IN-	0.05 from	*	**	***	

Compound	Thifensulfuron-methyl	IN-L9225	IN-JZ789	2-acid-3-tri-uret	IN-L9223	IN-A4098	IN-V7160	IN-W8268	IN-A5546	Value in accordance with EU endpoint y/n/ Reference*
fraction		parent	IN-L9225	IN-L9225 1.0 from IN-JZ789	L9225	parent 0.14 from IN-L9225				

a/b: Parent physiochemical properties (vapour pressure, water solubility) used for metabolites (DAR, 2014)

*: N/A – simulated as stand alone parent assuming a peak of 9.6%

**: N/A – simulated as stand alone parent assuming a peak of 29.6%

***: 1 (applied as parent, application rates of GAP used, with no adjustments for relative molecular weight or % observed, as worst-case scenario)

The modelling for IN-A5546 has been used as surrogate worst-case leaching assessment for IN-L9226, for which no quantitative assessment was performed. IN-A5546 can be considered to represent the greater leaching risk relative to IN-L9226, due to its combination of longer DT₅₀ and greater mobility (EFSA Journal 2015;13(7):4201).

Table 8.8-4: PEC_{gw} for Thifensulfuron-methyl and associated metabolites on winter cereals (with FOCUS PEARL 5.5.5 and PELMO 6.6.4)

Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)											
	Thifensulfuron		IN-L9225		IN-JZ789		2-acid-3-triuret		IN-L9223		IN-A4098	
	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Châteaudun	<0.001	<0.001	0.143	0.131	0.607	0.569	0.182	0.184	2.332	2.180	0.222	0.230
Hamburg	<0.001	<0.001	0.538	0.515	1.045	0.955	0.283	0.226	2.030	1.795	0.279	0.264
Jokioinen	<0.001	<0.001	0.346	0.373	1.122	0.953	0.168	0.136	3.174	2.541	0.252	0.218
Kremsmünster	< 0.001	<0.001	0.403	0.393	0.687	0.744	0.244	0.227	1.127	1.338	0.215	0.232
Okehampton	<0.001	<0.001	0.573	0.497	0.697	0.650	0.215	0.193	1.085	1.031	0.206	0.202
Piacenza	<0.001	<0.001	0.267	0.249	0.504	0.586	0.207	0.193	1.451	1.430	0.202	0.200
Porto	<0.001	<0.001	0.261	0.300	0.561	0.525	0.101	0.095	1.058	1.021	0.153	0.155
Sevilla	<0.001	<0.001	<0.001	0.005	0.139	0.172	0.014	0.028	1.231	1.012	0.021	0.054
Thiva	<0.001	<0.001	0.043	0.024	0.455	0.296	0.157	0.083	2.714	1.752	0.261	0.160

Table 8.8-5: PEC_{gw} for metabolites applied as parent on winter cereals (with FOCUS PEARL 5.5.5 and PELMO 6.6.4)

Scenario	80 th Percentile PEC _{gw} at 1 m Soil Depth (µg/L)					
	IN-V7160		IN-W8268		IN-A5546	
	PEARL	PELMO	PEARL	PELMO	PEARL	PELMO
Châteaudun	<0.001	<0.001	0.048	0.046	<0.001	<0.001
Hamburg	<0.001	<0.001	0.195	0.171	<0.001	<0.001
Jokioinen	<0.001	<0.001	0.343	0.266	<0.001	<0.001
Kremsmünster	<0.001	<0.001	0.121	0.106	<0.001	<0.001
Okehampton	<0.001	<0.001	0.151	0.168	<0.001	<0.001
Piacenza	<0.001	<0.001	0.067	0.077	<0.001	<0.001
Porto	<0.001	<0.001	0.087	0.163	<0.001	<0.001
Sevilla	<0.001	<0.001	0.002	0.002	<0.001	<0.001
Thiva	<0.001	<0.001	0.015	0.008	<0.001	<0.001
Every Other Year						
Hamburg	!	!	0.101	0.095	!	!
Jokioinen	!	!	0.141	0.146	!	!
Kremsmünster	!	!	0.070	0.061	!	!
Okehampton	!	!	0.071	0.077	!	!
Porto	!	!	!	0.086	!	!
Every 3 rd Year						
Hamburg	!	!	0.075	!	!	!
Jokioinen	!	!	0.102	0.097	!	!

Final Conclusions:

PECgw values for Thifensulfuron-methyl and metabolites IN-V7160 and IN-A5546 are below the trigger value of 0.1 µg/L (<0.001 µg/L) in all scenarios and models.

The maximum PECgw values for non toxicologically relevant metabolites IN-L9225, IN-JZ789, 2-acid-3-triuret, IN-L9223, IN-A4098 and IN-W8268 are given below and the assessment of relevance of these metabolites in ground water according to SANCO/221/2000 –rev.11 document will be reported in the dRR Part B10.

Metabolite	PECgw (µg/L)	Scenario	Model
IN-L9225	0.573	Okehampton	PEARL
IN-JZ789	1.122	Jokioinen	
2-acid-3-triuret	0.283	Hamburg	
IN-L9223	3.174	Jokioinen	
IN-A4098	0.279	Hamburg	
IN-W8268	0.343	Jokioinen	

Therefore, the use if HIFEN doesn't pose any risk for ground water.

According to dRR Part B 10 the metabolites IN-A4098 and IN-W8268 were considered as toxicologically relevant but in agreement with EFSA Supporting publication 2020:EN-1627 only IN-W8268 must be considered as relevant, thus refinements every 2 and 3 years have been done accordingly. After the refinements the Applicant proposes the next mitigation measures.

SPe2: To protect ground water apply this product every 2 years in alkaline silty loam soils with M.O. content greater than 3.7% (Kremsmünster).

SPe2: To protect ground water apply this product every 3 years in sandy soils (Hamburg).

As Jokioinen, Okehampton and Porto scenarios are not relevant for Poland, no mitigation measures have been proposed.

Therefore, dRR Part B10 will be amended accordingly.

ZRMS comments:

The PECgw calculations for thifensulfuron-methyl and its metabolites were accepted. PECgw have been calculated for all scenarios according to the GAP using the models FOCUS PELMO v 6.6.4 FOCUS PEARL 5.5.5.

Peer- reviewed endpoints for thifensulfuron-methyl and its metabolites have been presented in EFSA conclusion EFSA Journal 2015;13(7) :4201) were used in modelling.

Interception has been appropriate to the proposed BBCH of crops (EFSA guidance was published, (2014;12(5):3662). According EFSA Guidance (2014) was used geometric mean for Kfoc in modelling PECgw.

PECgw values for thifensulfuron-methyl are below the trigger value of 0.1 µg/L(<0.0001 µg/L) for all degradation pathways for proposed in GAP. PECgw values for IN-V7160 , IN-A5546 metabolites are below the trigger value of 0.1 µg/L (<0.0001 µg/L) in PEARL and PELMO models.

The PECgw values for metabolites IN-L9225, IN-A4098, IN-JZ789, IN-L9223 and IN-W8268 and 2-acid-3-triuret are above the trigger value of 0.1 µg/L and in some cases they exceed higher than the trigger value of 0.75 µg/L.

The assessment relevance of the metabolites in ground water according to SANCO/221/2000 –rev.10 document is reported in the dRR Part B10.

Following mitigation measures can be use on national level when End of Winter dates are considered:

SPe2: To protect ground water apply this product every 2 years in alkaline silty loam soils with M.O. content greater than 3.7% (Kremsmünster).

SPe2: To protect ground water apply this product every 3 years in sandy soils (Hamburg).

As Jokioinen, Okehampton and Porto scenarios are not relevant for Poland, no mitigation measures have been proposed.

PL: please see part A.

8.9 Predicted Environmental Concentrations in surface water (PEC_{sw}) (KCP 9.2.5)

8.9.1 Justification for new endpoints

Not relevant as there is no deviation to EU agreed endpoints.

8.9.2 Active substance, relevant metabolites and the formulation (KCP 9.2.5)

Table 8.9-1: Input parameters related to application for PEC_{sw/sed} calculations

Plant protection product	Thifensulfuron 75% WG
Use No.	1
Crop	Winter cereals (wheat, barley, rye, oats, triticale)
Application rate (kg as/ha)	Thifensulfuron-mehtyl: 0.03
Number of applications/interval (d)	1/-
Application window	Oct-Feb, no interception (worst case)
Application method	Foliar spray
CAM (Chemical application method)	CAM 2
Soil depth (cm)	4 cm
Models used for calculation	FOCUS STEPS 1-2 v3.2, FOCUS SWASH v5.3, FOCUS PRZM v4.3.1, FOCUS MACRO v5.5.4, FOCUS TOXWA v5.5, SWAN v 5.0.1

Table 8.9-2: FOCUS Step 3 Scenario related input parameters for PEC_{sw/sed} calculations for the application of Thifensulfuron 75% WG

Scenario	Application window used in modelling
	End of Winter*
D1	21/04
D2	01/03
D3	18/03
D4	01/04
D5	01/03
D6	11/02
R1	27/03
R3	12/02
R4	12/02

***Application dates according to EFSA Journal
2016;14(4):4453**

Table 8.9-3: Input parameters related to active substance Thifensulfuron-methyl and metabolites for $PEC_{sw/sed}$ calculations STEP 1/2 and 3(/4) (if necessary)

Compound	Thifensulfuron-methyl	Metabolite X*	Value in accordance to EU endpoint y/n/ Reference
Molecular weight (g/mol)	387.4	387.4*	EFSA Journal 2015;13(7):4201
Saturated vapour pressure (Pa)	5.2×10^{-9} at 20°C	not required for Step 1+2	
Water solubility (mg/L)	2240	1000	
Diffusion coefficient in water (m ² /d)	4.3×10^{-5}	not required for Step 1+2	default
Diffusion coefficient in air (m ² /d)	0.43		
K _{foc} (mL/g)	13.3 (geomean, n=9) / 7.71	0 (worst-case)	EFSA Journal 2015;13(7):4201
Freundlich Exponent 1/n	0.932 (arithmetic mean, n=9)	not required for Step 1+2	default
Plant Uptake	0		
Wash-Off factor from Crop (1/mm)	0.05 (MACRO) 0.50 (PRZM)		
DT _{50,soil} (d)	1.39 (geomean, normalisation to 10 kPa, 20 °C with Q ₁₀ of 2.58, n=6)	1000 (default)	EFSA Journal 2015;13(7):4201
DT _{50,water} (d)	22.8		
DT _{50,sed} (d)	1000 (default)		
DT _{50,whole system} (d)	22.8		
Maximum occurrence observed (% molar basis with respect to the parent)	Sediment: 1.08%	Soil: 100 Water: 100 Sediment: 100 Total system: 100	

*** Rather than running metabolites specific assessments using individual endpoints and peak occurrence levels, a simple conservative first-tier assessment was performed with the parameters shown, which was intended to be protective of all metabolites (EFSA Journal 2015;13(7):4201)**

PEC_{sw/sed}

Table 8.9-4: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Thifensulfuron-methyl following single application of Thifensulfuron-methyl on winter cereals

Scenario FOCUS	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21 d- PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
Step 1	---	10.10	Drainage/runoff	7.46	1.31
Step 2					
Northern Europe	Oct-Feb	0.91	Drainage/runoff	0.67	0.12
Southern Europe		0.78	Drainage/runoff	0.58	0.10
Step 3					
D1	ditch	0.205	Drainage	0.165	0.119
D1	stream	0.171	Drainage	0.063	0.048
D2	ditch	1.625	Drainage	0.426	0.270
D2	stream	1.027	Drainage	0.231	0.160
D3	ditch	0.190	Drainage	0.008	0.018
D4	pond	0.007	Drainage	0.006	0.004
D4	stream	0.145	Drainage	<0.001	0.003
D5	pond	0.007	Drainage	0.005	0.004
D5	stream	0.150	Drainage	<0.001	0.003
D6	ditch	0.189	Drainage	0.005	0.013
R1	pond	0.007	Runoff	0.006	0.005
R1	stream	0.138	Runoff	0.005	0.012
R3	stream	0.303	Runoff	0.010	0.025
R4	stream	0.199	Runoff	0.009	0.022

FOCUS Step 4

Table 8.9-5: Global maximum PEC_{sw} values for Thifensulfuron-methyl, following single application of Thifensulfuron 75% WG to winter cereals according to the central EU zone GAP according to surface water Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 Thifensulfuron-methyl							
Nozzle reduction	Vegetative strip (m)	None				5*	10	15**	20
	No spray buffer (m)	5	10	15	20	5	10	15	20
None	D1 ditch	0.160	0.160	-	-	-	-	-	-
50 %		0.160	-	-	-	-	-	-	-
None	D1 stream	0.152	0.152	-	-	-	-	-	-
50 %		0.152	-	-	-	-	-	-	-
None	D2 ditch	1.625	1.625	-	-	-	-	-	-
50 %		1.625	-	-	-	-	-	-	-
None	D2 stream	1.027	1.027	-	-	-	-	-	-
50 %		1.027	-	-	-	-	-	-	-
None	D3 ditch	0.051	0.027	-	-	-	-	-	-
50 %		0.026	-	-	-	-	-	-	-
None	D4 stream	0.053	0.028	-	-	-	-	-	-
50 %		0.027	-	-	-	-	-	-	-
None	D5 stream	0.055	0.029	-	-	-	-	-	-
50 %		0.027	-	-	-	-	-	-	-
None	D6 ditch	0.051	0.028	-	-	-	-	-	-
50 %		0.026	-	-	-	-	-	-	-
None	R1 stream	0.138	0.138	-	-	0.084	0.057	0.043	-
50 %		0.138	-	-	-	0.084	0.057	-	-
None	R3 stream	0.303	0.303	-	-	0.194	0.134	0.102	0.069
50 %		0.303	-	-	-	0.194	0.134	0.102	-
None	R4 stream	0.199	0.199	-	-	0.130	0.090	0.069	0.047
50 %		0.199	-	-	-	0.130	0.090	0.069	-

*0.4 was used for run off reduction and erosion respectively in water and sediment according to the Austrian Environmental Agency (AGES).

**0.7 and 0.9 was used for run off reduction and erosion respectively in water and sediment according to the Austrian Environmental Agency (AGES).

Table 8.9-6: Global maximum PEC_{sw} values for Thifensulfuron-methyl, following single application of Thifensulfuron 75% WG to winter cereals according to the central EU zone GAP according to surface water VFSSMOD Step 4

PEC _{sw} (µg/L)	Scenario	STEP 4 VFSSMOD Thifensulfuron-methyl	
Nozzle reduction	Vegetative strip (m)	5	10
	No spray buffer (m)	5	10
None	R1 stream	0.046	-
50 %		-	-
None	R3 stream	0.065	0.034
50 %		0.032	-
None	R4 stream	0.046	-
50 %		-	-

Conclusion

Since the dominant entry route for the scenarios D1 and D2 is drainage, risk mitigation measures such as buffer zone and nozzle reduction have no impact on the outcome of the results of the PEC_{sw}. However, since the scenarios D1 and D2 are not considered in the risk assessment in all the Members States across Europe, further refinement will be necessary at national level when relevant and necessary.

The scenarios D1 and D2 are not relevant for ZRMS Poland, therefore the obtained results of the PEC_{sw} are considered sufficient.

Metabolites of Thifensulfuron-methyl

Table 8.9-7: FOCUS Step 1, 2 and 3 PEC_{sw} and PEC_{sed} for Metabolite X following single application to winter cereals

Scenario	Waterbody	Max PEC _{sw} (µg/L)	Dominant entry route	21 d- PEC _{sw, twa} (µg/L)	Max PEC _{sed} (µg/kg)
FOCUS					
Step 1	---	20.28	Drainage/runoff	20.13	< 0.001
Step 2					
Northern Europe	Oct-Feb	5.94	Drainage/runoff	5.90	< 0.001
Southern Europe		4.81	Drainage/runoff	4.77	< 0.001

8.9.2.1 PEC_{sw/sed} of HIFEN

The PEC_{sw} for HIFEN was calculated using the following equation:

$$PEC_{sw} (\mu g/L) = \frac{\%Drift_{90th\ \%ile} \times Application\ rate\ (g/ha)}{Water\ depth\ (cm) \times 10}$$

The application of HIFEN is 0.04 kg/ha, corresponding to 40 g/ha for winter cereals. The depth of the static water body was assumed to be 30 cm. The resulting maximum instantaneous PEC_{sw} value is presented in the table 8.9-7.

Table 8.9-8: PEC_{sw} for HIFEN following single application to winter cereals

Crop	Distance (m)	Drift (%)	Max PEC _{sw} (µg/l)
Winter cereals (wheat, barley, rye, oats, triticale)	3	2.77	0.369

The PEC_{sed} for HIFEN was calculated using the following equation:

$$PEC_{sed} (\mu g/kg dw) = \frac{\%Drift_{90th\ mile} \times Application\ rate\ (g/ha) \times \%Active\ substance\ in\ sediment}{1000 \times sediment\ density\ (g/cm^3) \times sediment\ height\ (cm)}$$

The application of HIFEN is 0.04 kg/ha, corresponding to 40 g/ha for winter cereals. The maximum percentage of Thifensulfuron-methyl in the sediment is 1.08% and 75% in the formulated product, thus the actual percentage in the sediment is 1.08 x 0.75 = 0.81. The height of the sediment was assumed to be 5 cm and the sediment density was assumed to be 1.3 g/cm³. The resulting maximum instantaneous PEC_{sed} value is presented in the table 8.9-9.

Table 8.9-9: PEC_{sed} for HIFEN following single application to winter cereals

Crop	Distance (m)	Drift (%)	% of Thifensulfuron-methyl in sediment	Max PEC _{sed} (µg/kg) (based on maximum occurrence)
Winter cereals (wheat, barley, rye, oats, triticale)	1	2.77	0.81	0.014

zRMS comments:

Evaluator agree with Applicant calculations of PEC_{sw}/sed.

Predicted environmental concentrations of active substance in surface water (PEC_{sw}) and sediment (PEC_{sed}) were calculated using the simulation models FOCUS.

Applicant used endpoints in accordance EFSA endpoints (Journal 2015; 13(7):4201)

In opinion of ZRMS-PL calculations at Step 4 PEC_{sw} were accepted only for calculations carried out in accordance to Working Document of the Central Zone in the Authorisation of Plant Protection Products (2018), the following approaches for simulating in Step 4 are recommended for the Core Assessment:

According *Landscape And Mitigation Factors In Aquatic Risk Assessment. Volume 1. Extended Summary and Recommendations*. Report of the FOCUS Working Group on Landscape and Mitigation Factors in Ecological Risk Assessment, EC Document Reference SANCO/10422/2005 v2.0. 169 pp and FOCUS (2007) and Working Document of the Central Zone in the Authorisation of Plant Protection Products (Environmental Fate and Behaviour. Ver.1.rev1. 2018.

Bufferzone	Fractional reduction in			
	Run-off volume	Run-off flux	Erosion volume	Erosion flux
10-12 meters	60%	60%	85%	85%
18-20 meters	80%	80%	95%	95%

For PEC_{sw}/sed calculations at STEP 4, the values used for reduction in run off volume and flux and erosion mass and flux is 0.5 and 0.8 for 5 meters of vegetative buffer strip according to the Austrian Environmental Agency (AGES) and

the values uses for reduction in run off volume and flux and erosion mass and flux is 0.7 and 0.9 respectively for 15 meters of vegetative buffer strip.

The calculation to surface water performed according VFSMOD Step 4 was accepted in PL.

The approach according to the Austrian Environmental Agency (AGES) and VFSMOD should be considered at national level.

This modelling report presents an assessment to obtain predicted environmental concentrations in surface water (PEC_{sw}) and sediment (PEC_{sed}) of active substance thifensulfuron-methyl.

8.10 Fate and behaviour in air (KCP 9.3, KCP 9.3.1)

Table 8.10-1 Summary of atmospheric degradation and behaviour

Compound	Thifensulfuron-methyl
Direct photolysis in air	Not studies – no data requested
Quantum yield of direct phototransformation	Not studied – no data requested
Photochemical oxidative degradation in air	DT50 (h): 3.5 days derived by the Atkinson model (version 1.92) OH (12h) concentration assumed =1.5E6 OH/cm ³
Volatilisation	Not studied Vapour pressure (Pa): 5.19×10^{-9} Pa at 20°C Henry's Law Constant (Pa.m ³ /mol): 3.25×10^{-8} Pa.m ³ /mol at pH5 3.23×10^{-9} Pa.m ³ /mol at pH7
Metabolites	None

The vapour pressure at 20 °C of the active substance Thifensulfuron-methyl is $< 10^{-5}$ Pa. Hence the active substance Thifensulfuron-methyl is regarded as non-volatile. Therefore, exposure of adjacent surface waters and terrestrial ecosystems by the active substance Thifensulfuron-methyl due to volatilization with subsequent deposition should not be considered.

ZRMS comments:

The submitted by Applicant data in dRR were accepted.

Appendix 1 Lists of data considered in support of the evaluation

Appendix 2 Detailed evaluation of the new Annex II studies

Appendix 3 Additional information provided by the applicant (e.g. detailed modelling data)