

Test Material: Sulfometuron methyl

MRID: 49393601

Title: Analytical Method for the Determination of Sulfometuron Methyl and Metabolites in Water Using LC/MS/MS

MRID: 49393602

Title: Independent Laboratory Validation of DuPont-39340 "Analytical Method for the Determination of Sulfometuron Methyl and Metabolites in Water Using LC/MS/MS"

EPA PC Code: 122001

OCSPP Guideline: 850.6100

For CDM Smith

Primary Reviewer: Lynne Binari

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Date: 10/29/14

Analytical method for sulfometuron methyl and its products IN-00581, IN-X0993, and IN-D5803 in water

Reports: ECM: EPA MRID No.: 49393601. Henze, R., and J. Stry. 2013. Analytical Method for the Determination of Sulfometuron Methyl and Metabolites in Water Using LC/MS/MS. DuPont Project ID: DuPont-39340. Report prepared by E. I. du Pont de Nemours and Company, DuPont Crop Protection, Stine-Haskell Research Center, Newark, Delaware, sponsored and submitted by E. I. du Pont de Nemours and Company, Wilmington, Delaware; 81 pages. Final report issued December 3, 2013.
 ILV: EPA MRID No. 49393602. Fiorito, B. 2014. Independent Laboratory Validation of DuPont-39340 "Analytical Method for the Determination of Sulfometuron Methyl and Metabolites in Water Using LC/MS/MS". Alliance Pharma Project No.: 140110. DuPont Project ID: DuPont-39497. Report prepared by Alliance Pharma, Malvern, Pennsylvania, sponsored and submitted by E. I. du Pont de Nemours and Company, Wilmington, Delaware; 133 pages. Final report issued May 20, 2014.

Document No.: MRIDs 49393601 & 49393602

Guideline: 850.6100
 EC SANCO/825/00 rev. 8.1 (p. 11 of MRID 49393602)

Statements: ECM: The study director reported that the development work for this ECM was not required to be conducted in compliance with USEPA Good Laboratory Practice (GLP) standards; however, the work was conducted in a GLP compliant facility according to Standard Operating Procedures (p. 3 of MRID 49393601). Signed and dated Data Confidentiality, GLP, and Authenticity Certification statements were provided (pp. 2-4). A Quality Assurance statement was not provided.
 ILV: The study was conducted in compliance with USEPA GLP standards (p. 3 of MRID 49393602). Signed and dated Data Confidentiality, GLP, Quality Assurance, and Authenticity Certification statements were provided (pp. 2-5).

Classification: This analytical method is classified as Supplemental. The ILV successfully duplicated the method with acceptable performance for all analytes in all test systems, however, the ECM performance data for 0.10 µg/kg (LOQ) fortified IN-00581 in ground water did not meet OCSPP Guideline 850.6100 criteria. The performance data were acceptable for the other three test analytes and were acceptable for IN-00581 in the other test media. In addition, ECM reported recoveries were corrected for any residues detected in the matrix control samples. The ILV test drinking water matrix was not characterized.

PC Code: 122001

Reviewer: Patricia Engel, Physical Scientist

Signature:
Date: 9-27-2018



Reviewer: Dena Barrett, Senior Fate Scientist

Signature:
Date: 9-27-2018



Executive Summary

This analytical method, DuPont-39340, is designed for the quantitative determination of sulfometuron methyl and its products IN-00581, IN-X0993, and IN-D5803 in ground water, surface water, and drinking water using HPLC/MS/MS. The method is quantitative for the analytes at the stated LOQ of 0.10 µg/kg. The LOQ is less than the current lowest toxicological level of concern in water. The independent laboratory validated the method for analysis of sulfometuron methyl, IN-00581, IN-X0993, and IN-D5803 in ground water, surface water, and drinking water after one trial. No major modifications were made by the independent laboratory. The ILV test ground and surface water matrices were characterized but the drinking water matrix was not characterized.

Table 1. Analytical Method Summary

Analyte(s) by Pesticide	MRID		EPA Review	Matrix ¹	Method Date (dd/mm/yyyy)	Registrant	Analysis	Limit of Quantitation (LOQ)
	Environmental Chemistry Method	Independent Laboratory Validation						
Sulfometuron methyl	49393601	49393602	9/27/18	Water	03/12/2013	E. I. du Pont de Nemours and Company	HPLC/MS/MS	0.10 µg/kg
IN-00581								
IN-X0993								
IN-D5803								

¹ For the ECM, the surface, ground, and drinking water matrices were fully characterized (Appendix 4, pp. 76-81 of MRID 49393601). For the ILV, the surface water and ground water matrices were characterized, but not the drinking water (Appendix 2, pp. 131-133 of MRID 49393602).

I. Principle of the Method

Water (20.0 g, ± 1%) was acidified with concentrated formic acid (1.0 µL), then loaded under gravity flow onto a Waters Oasis HLB solid phase extraction (SPE) cartridge (1 g/20 mL) pre-conditioned with methanol and pH 3 water [HPLC grade water:concentrated formic acid (200:0.01, v:v); pp. 10-11, 13-14 of MRID 49393601]. The loaded cartridge was dried under vacuum for 10 minutes to remove water. Residues were eluted with 20 mL of basic acetonitrile [acetonitrile:1.0M ammonia hydroxide (98:2, v:v)]. The eluate was brought to volume (20 mL) with basic acetonitrile. An aliquot (10 mL) was concentrated to *ca.* 2 mL under nitrogen at 25-30°C, 0.5 mL of 0.01M aqueous ammonium acetate was added, and the sample reduced to <0.5 mL. The concentrated sample was amended with 50 µL methanol, brought to 1.0 mL with 0.01M aqueous ammonium acetate, and an aliquot filtered (syringe filter, pore size not specified) for LC/MS/MS analysis.

Samples were analyzed for sulfometuron methyl (DPX-T5648) and its products IN-00581, IN-X0993, and IN-D5803 by HPLC [Phenomenex C-18(2), 2.0 mm x 100 mm, 3 µm, 40°C] using a mobile phase of (A) 0.01M aqueous ammonium acetate and (B) methanol [percent A:B (v:v) at 0-0.3 min. 90:10, 7.0 min. 60:40, 7.1-8.5 min. 1:99, 8.6 min. 90:10] with MS/MS-ESI (AB Sciex API 5000 triple quadrupole MS, electrospray ionization, positive ion mode for sulfometuron methyl, IN-X0993, and IN-D5803, negative ion mode for IN-00581) detection and multiple reaction monitoring (MRM; pp. 9, 14-16 of MRID 49393601). For IN-D5803, ammonia adducts were used instead of the protonated compound, because IN-D5803 did not readily add a proton in the electrospray ion source, but did readily add NH₄⁺. Injection volume was 10 µL. Analytes were identified using two ion transitions; one for quantitation (Q) and one for confirmation (C). Ion transitions monitored were as follows: *m/z* 365.0→150.1 (Q) and *m/z* 365.0→67.0 (C) for sulfometuron methyl, *m/z* 182.0→105.9 (Q) and *m/z* 182.0→61.9 (C) for IN-00581, *m/z* 124.1→67.0 (Q) and *m/z*

124.1→107.0 (C) for IN-X0993, and m/z 233.2→199.0 (Q) and m/z 233.2→77.1 (C) for IN-D5803. An additional confirmation ion transition was reported for sulfometuron methyl (m/z 365.0→77.0), but this transition was not utilized in this ECM or the ILV.

The ILV performed the method as written with minor method modifications and equivalent equipment and instrumentation substitutions (pp. 14, 17-18 of MRID 49393602). Water samples were acidified with 10 μ L concentrated formic acid prior to SPE. A Symmetry C18 (2.1 mm x 100 mm, 3 μ m) HPLC column was substituted, and an AB Sciex Triple Quad 5500 MS was used. Strong background interference was found for the IN-D5803 confirmation ion transition m/z 233.2→77.1, therefore DuPont approved use of ion transition m/z 233.2→135.1 for confirmation (p. 13 of MRID 49393602).

LOQs and LODs for all analytes were the same in the ECM and ILV at 0.10 μ g/kg and 0.03 μ g/kg, respectively (pp. 8, 18 of MRID 49393601; p. 14 of MRID 49393602).

II. Recovery Findings

ECM (MRID 49393601): Mean recoveries and relative standard deviations (RSDs) were within guidelines (mean 70-120%; RSD \leq 20%) for analysis of sulfometuron methyl and its products IN-00581, IN-X0993, and IN-D5803 in drinking (tap) water, ground (well) water, and surface (creek) water at fortification levels of 0.10 μ g/kg (LOQ) and 1.0 μ g/kg (10x LOQ), with the exception of 0.10 μ g/kg (LOQ) IN-00581 in ground water (mean 123% and RSD 27.3% for quantitation ion analysis, mean 125% and RSD 27.8% for confirmation ion analysis; Tables 1-2, pp. 21-28 of MRID 49393601 and DER Attachment 2). The study authors excluded IN-00581 recovery results of 181% for the quantitation ion analysis and 187% for the confirmation ion analysis to yield mean recoveries (n =4) of 108% (RSD 8.6%) and 110% (RSD 1.7%), respectively, but did not provide supporting statistical tests to justify exclusion of the high recovery as an outlier. Recoveries were corrected for any residues detected in the matrix control samples (pp. 16-17; Appendix 2, pp. 58-63). Analytes were identified and quantified using two ion transitions; quantitation ion and confirmation ion recovery results were comparable. The water matrices were characterized (p. 13; Appendix 4, pp. 76-81).

ILV (MRID 49393602): Mean recoveries and relative standard deviations (RSDs) were within guidelines (mean 70-120%; RSD \leq 20%) for analysis of sulfometuron methyl and its products IN-00581, IN-X0993, and IN-D5803 in drinking (tap) water, surface (river) water, and ground water at fortification levels of 0.10 μ g/kg (LOQ) and 1.0 μ g/kg (10x LOQ; Tables 1-12, pp. 27-50 of MRID 49393602). Analytes were identified and quantified using two ion transitions; quantitation ion and confirmation ion recovery results were comparable. The method was validated for all analytes in the three water matrices at both fortification levels after one trial, with minor method and instrument parameter modifications (pp. 13-14, 17-18, 22, 25). The surface water and ground water matrices were characterized, but not the drinking water (Appendix 2, pp. 131-133).

Table 2. Initial Validation Method Recoveries for Sulfometuron methyl and Its Products IN-00581, IN-X0993, and IN-D5803 in Water¹

Analyte	Fortification Level (µg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
Drinking (Tap) Water						
Quantitation ion						
Sulfometuron methyl	0.10 (LOQ)	5	79-93	87	5.3	6.1
	1.0	5	67-85	75	6.7	8.8
IN-00581	0.10 (LOQ)	5	107-120	114	4.9	4.3
	1.0	5	80-91	85	4.5	5.3
IN-X0993	0.10 (LOQ)	5	88-113	102	9.9	9.6
	1.0	5	67-89	79	9.2	11.7
IN-D5803	0.10 (LOQ)	5	92-112	104	7.5	7.2
	1.0	5	90-110	102	8.1	7.9
Confirmation ion						
Sulfometuron methyl	0.10 (LOQ)	5	76-93	84	6.1	7.3
	1.0	5	66-86	76	7.2	9.6
IN-00581	0.10 (LOQ)	5	107-126	115	7.8	6.8
	1.0	5	80-85	83	1.8	2.2
IN-X0993	0.10 (LOQ)	5	93-110	101	7.8	7.8
	1.0	5	72-112	91	18.2	19.9
IN-D5803	0.10 (LOQ)	5	96-128	108	12.2	11.2
	1.0	5	89-102	97	6.1	6.3
Ground (Well) Water						
Quantitation ion						
Sulfometuron methyl	0.10 (LOQ)	5	87-100	91	5.4	6.0
	1.0	5	80-103	90	10.2	11.4
IN-00581	0.10 (LOQ)	5	98-181	123²	33.5	27.3²
	1.0	5	83-114	97	14.0	14.4
IN-X0993	0.10 (LOQ)	5	85-106	95	9.5	10.0
	1.0	5	70-77	74	2.5	3.4
IN-D5803	0.10 (LOQ)	5	99-112	104	5.2	5.0
	1.0	5	95-118	105	9.2	8.7
Confirmation ion						
Sulfometuron methyl	0.10 (LOQ)	5	82-95	87	5.1	5.9
	1.0	5	81-106	92	11.0	11.9
IN-00581	0.10 (LOQ)	5	108-187	125²	34.7	27.8²
	1.0	5	83-113	97	12.6	13.0
IN-X0993	0.10 (LOQ)	5	92-110	99	7.3	7.4
	1.0	5	63-79	72	8.0	11.2
IN-D5803	0.10 (LOQ)	5	92-115	106	9.7	9.2
	1.0	5	101-117	108	6.9	6.4
Surface (Creek) Water						
Quantitation ion						
Sulfometuron methyl	0.10 (LOQ)	5	87-102	97	5.9	6.2
	1.0	5	81-90	83	3.8	4.5
IN-00581	0.10 (LOQ)	5	76-113	98	15.2	15.5
	1.0	5	79-93	84	5.9	7.0
IN-X0993	0.10 (LOQ)	5	95-113	104	7.5	7.2
	1.0	5	84-102	91	8.2	9.0

Analyte	Fortification Level (µg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
IN-D5803	0.10 (LOQ)	5	91-101	97	3.7	3.9
	1.0	5	88-97	92	3.4	3.7
Confirmation ion						
Sulfometuron methyl	0.10 (LOQ)	5	85-99	94	6.1	6.4
	1.0	5	81-96	85	6.4	7.5
IN-00581	0.10 (LOQ)	5	80-115	97	16.1	16.7
	1.0	5	74-90	82	6.1	7.4
IN-X0993	0.10 (LOQ)	5	95-114	105	8.1	7.8
	1.0	5	81-98	86	7.1	8.3
IN-D5803	0.10 (LOQ)	5	75-116	99	15.6	15.7
	1.0	5	81-103	91	8.6	9.5

Data (corrected for residues in matrix control samples) were obtained from Tables 1-2, pp. 21-28 of MRID 49393601 and DER Attachment 2 (standard deviations).

1 Matrix characterizations were provided (Appendix 4, pp. 76-81 of MRID 49393601). The surface water was identified as White Clay Creek, but the primary source was not further described. Primary sources for the well water and tap water were not reported.

2 Values in **red** text are outside the target recovery range of 70-120%. The study authors excluded the recovery results of 181% for the quantitation ion analysis and 187% for the confirmation ion analysis to yield mean recoveries (n =4) of 108% (RSD 8.6%, range 98-118%) and 110% (RSD 1.7%, range 108-112%), respectively (Table 1, p. 21; Table 2, p. 25 of MRID 49393601). However, no supporting statistical tests, such as Grubbs' and Dixon tests, were presented to justify exclusion of the high recovery as an outlier.

Table 3. Independent Validation Method Recoveries for Sulfometuron methyl and its products IN-00581, IN-X0993, and IN-D5803 in Water¹

Analyte	Fortification Level (µg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
Drinking (Tap) Water						
Quantitation ion						
Sulfometuron methyl	0.10 (LOQ)	5	76-107	89	12.4	14
	1.0	5	66-81	75	5.3	7
IN-00581	0.10 (LOQ)	5	86-114	97	11.7	12
	1.0	5	79-98	92	7.5	8
IN-X0993	0.10 (LOQ)	5	86-105	96	7.4	8
	1.0	5	71-94	83	8.3	10
IN-D5803	0.10 (LOQ)	5	87-99	93	4.3	5
	1.0	5	83-104	94	7.5	8
Confirmation ion						
Sulfometuron methyl	0.10 (LOQ)	5	75-106	89	12.1	14
	1.0	5	63-79	72	5.7	8
IN-00581	0.10 (LOQ)	5	82-119	98	14.9	15
	1.0	5	79-100	90	7.5	8
IN-X0993	0.10 (LOQ)	5	81-93	87	5.4	6
	1.0	5	77-88	84	4.9	6
IN-D5803	0.10 (LOQ)	5	87-97	93	4.4	5
	1.0	5	82-103	94	7.5	8
Surface (River) Water						
Quantitation ion						
Sulfometuron methyl	0.10 (LOQ)	5	92-98	94	2.3	2
	1.0	5	77-96	90	7.5	8
IN-00581	0.10 (LOQ)	5	67-74	71	3.4	5

Analyte	Fortification Level (µg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
	1.0	5	114-128	119	5.3	4
IN-X0993	0.10 (LOQ)	5	89-113	100	8.7	9
	1.0	5	84-107	96	8.4	9
IN-D5803	0.10 (LOQ)	5	78-89	82	4.0	5
	1.0	5	70-94	86	9.9	12
Confirmation ion						
Sulfometuron methyl	0.10 (LOQ)	5	90-97	93	2.9	3
	1.0	5	75-95	87	7.6	9
IN-00581	0.10 (LOQ)	5	73-81	75	3.4	4
	1.0	5	111-120	116	3.9	3
IN-X0993	0.10 (LOQ)	5	85-107	94	8.5	9
	1.0	5	87-105	99	7.1	7
IN-D5803	0.10 (LOQ)	5	81-90	84	3.4	4
	1.0	5	70-92	85	8.9	11
Ground Water						
Quantitation ion						
Sulfometuron methyl	0.10 (LOQ)	5	76-84	80	3.6	5
	1.0	5	87-92	90	2.1	2
IN-00581	0.10 (LOQ)	5	85-94	88	3.5	4
	1.0	5	98-109	105	4.0	4
IN-X0993	0.10 (LOQ)	5	91-119	101	11.6	11
	1.0	5	97-116	111	7.8	7
IN-D5803	0.10 (LOQ)	5	89-103	96	5.2	5
	1.0	5	108-117	112	3.5	3
Confirmation ion						
Sulfometuron methyl	0.10 (LOQ)	5	77-83	79	2.7	3
	1.0	5	86-95	90	3.3	4
IN-00581	0.10 (LOQ)	5	90-109	102	7.6	7
	1.0	5	104-114	108	5.3	5
IN-X0993	0.10 (LOQ)	5	80-88	84	3.7	4
	1.0	5	107-113	110	2.3	2
IN-D5803	0.10 (LOQ)	5	83-100	92	5.8	6
	1.0	5	107-115	110	3.2	3

Data (uncorrected recovery results) were obtained from Tables 1-12, pp. 27-50 of MRID 49393602.

1 Matrix characterizations were provided for the surface water and ground water, but not for the drinking water (Appendix 2, pp. 131-133 of MRID 49393602). The surface water was identified as Goose River, but the primary source was not further described. The primary source for the ground water was not reported. The drinking water was tap water from Alliance Pharma, Malvern, Pennsylvania (p. 17 of MRID 49393602).

III. Method Characteristics

LOQs and LODs for all analytes were the same in the ECM and ILV at 0.10 µg/kg and 0.03 µg/kg, respectively (pp. 8, 18 of MRID 49393601; p. 14 of MRID 49393602). The ECM defined the LOQ as the lowest fortification level at which acceptable average recoveries (70-120%, RSD <20%) were achieved, and the fortification level at which analyte peaks were consistently produced at a level *ca.* 10-20 times the signal at the corresponding retention time of the analyte in an untreated matrix control sample (p. 18 of MRID 49393601). The LOD was estimated as *ca.* 3x background noise at the corresponding retention time of the least responsive analyte, or *ca.* one-third of the LOQ.

Table 4. Method Characteristics for Sulfometuron methyl and Its Products IN-00581, IN-X0993, and IN-D5803 in Water

	Sulfometuron methyl	IN-00581	IN-X0993	IN-D5803	
Limit of Quantitation (LOQ)	0.10 µg/kg				
Limit of Detection (LOD)	0.03 µg/kg				
Linearity (calibration curve r^2 and concentration range) ¹	ECM:	Q ion: $r^2 = 0.9961$ C ion: $r^2 = 0.9982$	Q ion: $r^2 = 0.9986$ C ion: $r^2 = 0.9989$	Q ion: $r^2 = 0.9999$ C ion: $r^2 = 0.9993$	Q ion: $r^2 = 0.9999$ C ion: $r^2 = 0.9997$
	ILV:	Q ion: $r^2 = \mathbf{0.994}$ C ion: $r^2 = \mathbf{0.980}$	Q ion: $r^2 = \mathbf{0.993}$ C ion: $r^2 = \mathbf{0.992}$	Q ion: $r^2 = 0.997$ C ion: $r^2 = \mathbf{0.994}$	Q ion: $r^2 = \mathbf{0.992}$ C ion: $r^2 = \mathbf{0.988}$
	Range:	0.50-25 ng/mL			
Repeatable	ECM:	Yes, except for 0.10 µg/kg (LOQ) IN-00581 in ground water.			
	ILV:	Yes			
Reproducible	Yes				
Specific	Yes				

Data were obtained from p. 9; Figure 2, pp. 33-36 of MRID 49393601; pp. 11-14 of MRID 49393602; DER Attachment 2.

¹ ILV calibration curve r^2 values were derived from reported r values ($1/x^2$ weighting; DER Attachment 2). Linearity of provided ECM and ILV standard curves could not be verified by the reviewer because the individual calibration standard data were not provided. Coefficient of determination (r^2) values less than 0.995 are highlighted in **red** text.

IV. Method Deficiencies and Reviewer's Comments

- For the ECM, the following fortifications did not meet OCSPP Guideline 850.6100 criteria for precision and accuracy (mean recoveries for replicates at each spiking level between 70% and 120% and relative standard deviations (RSD) $\leq 20\%$): 0.10 µg/kg (LOQ) fortified IN-00581 in ground water (mean 123% and RSD 27.3% for quantitation ion analysis, mean 125% and RSD 27.8% for confirmation ion analysis; Tables 1-2, pp. 21-28 of MRID 49393601 and DER Attachment 2). The study authors excluded recovery results of 181% for the quantitation ion analysis and 187% for the confirmation ion analysis to yield mean recoveries ($n = 4$) of 108% (RSD 8.6%) and 110% (RSD 1.7%), respectively, but did not provide supporting statistical tests to justify exclusion of the high recovery as an outlier.
- For the ECM, reported recoveries were corrected for any residues detected in the matrix control samples (pp. 16-17; Appendix 2, pp. 58-63 of MRID 49393601). For the ILV, example calculations indicate recoveries were not corrected (pp. 21-22; Tables 1-12, pp. 27-50 of MRID 49393602).

3. For the ECM, no chromatograms for ground water analyses (quantitation or confirmation) were provided. No chromatograms for surface and drinking water confirmation ion analyses were provided. Chromatograms of reagent blank samples were not provided.
4. For the ECM, the study authors reported interferences, under quantitation ion conditions, were <LOD at the retention times of sulfometuron methyl and its products in the matrix control samples (p. 18; Figure 4, pp. 43-52 of MRID 49393601). Low levels of sulfometuron methyl detected in matrix control samples were attributed to a low level of laboratory background contamination. Baseline noise was apparent under IN-X0993 conditions for the lower calibration standards (0.50 and 1.0 ng/mL) and LOQ fortifications in both the surface water and drinking water matrices (Figure 3, pp. 37, 39; Figure 4, pp. 45-46, 51-52 of MRID 49393601).

For the ILV, the study author reported interferences were <30% of the LOQ for all analytes (p. 24 of MRID 49393602). Low levels of sulfometuron methyl were detected in reagent blank samples (Figure 6, p. 80; Figure 7, p. 84; Figure 8, p. 88). Low levels of IN-00581 were detected in drinking and surface water matrix control samples (Figure 9, p. 91; Figure 10, pp. 95, 97). Baseline noise was apparent for the lower calibration standards (0.5 and 1.0 mg/mL) under IN-00581 confirmation ion conditions and IN-X0993 quantitation and confirmation ion conditions (Figure 2, p. 60; Figure 4, pp. 69, 72). Baseline noise was also apparent for IN-00581 in ground water and IN-X0993 in all three water matrices (Figure 6, pp. 79, 81; Figure 7, pp. 83, 85; Figure 8, pp. 87, 89; Figure 9, pp. 91, 93; Figure 10, pp. 95, 97; Figure 11, pp. 99, 101; Figure 12, pp. 103, 105; Figure 13, pp. 107, 109; Figure 14, pp. 111, 113; Figure 15, pp. 115, 117; Figure 16, pp. 119, 121; Figure 17, pp. 123, 125).

5. For both the ECM and ILV, standard curves were provided, but the individual calibration standard data were not reported (Figure 2, pp. 33-36 of MRID 49393601; Figure 5, pp. 75-78 of MRID 49393602).

For the ILV, Figure 2 (p. 58-62 of MRID 49393602) of IN-00581 calibration standards, Figure 3 (pp. 64-68) of IN-D5803 standards, and Figure 4 (pp. 70-74) of IN-X0993 standards are all incorrectly titled as Figure 1 sulfometuron methyl standards.

6. For the ILV, linearity (r^2) of the calibration standards was not always ≥ 0.995 (see Table 4 above).
7. For the ECM, matrix characterizations were provided, but the primary source of each water matrix was not adequately reported (Appendix 4, pp. 76-81 of MRID 49393601). The surface water was identified as White Clay Creek, but the primary source was not further described. Primary sources for the well water and tap water were not reported.

For the ILV, the surface water and ground water matrices were characterized, but not the drinking water (Appendix 2, pp. 131-133 of MRID 49393602). The surface water was identified as Goose River, but the primary source was not further described. The drinking (tap) water was collected at the test facility (p. 17). The primary source for the ground water was not reported.

8. It was reported for the ILV that one analyst could complete a set of twelve samples (two matrix control samples and ten validation samples) in one 8-hour day with LC/MS/MS analysis performed unattended the same day (p. 25 of MRID 49393602).
9. The reported limit of quantitation (LOQ) was determined as the lowest level of method validation (LLMV). Further work could have been done to explore the actual LOQ. This means that concentrations can be reliably quantified at the LOQ (*i.e.*, LLMV), but whether lower concentrations may also be reliably quantified is uncertain. This is a minor deficiency because the LOQ satisfies the requirement that the LOQ is less than the current toxicological levels of concern.

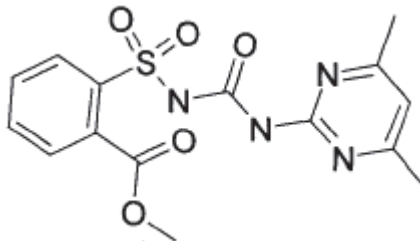
LOQs and LODs for the analytes were the same in the ECM and ILV. The LOQ and LOD were 0.10 µg/kg and 0.03 µg/kg, respectively, for sulfometuron methyl, IN-00581, IN-X0993, and IN-D5803 (p. 9 of MRID 49393601; p. 14 of MRID 49393602). The ECM defined the LOQ as the lowest fortification level at which acceptable average recoveries (70-120%, RSD <20%) were achieved, and the fortification level at which analyte peaks were consistently produced at a level *ca.* 10-20 times the signal at the corresponding retention time of the analyte in an untreated matrix control sample (p. 18 of MRID 49393601). The ECM estimated the LOD as *ca.* 3x background noise at the corresponding retention time of the least responsive analyte, or *ca.* one-third of the LOQ.

V. References

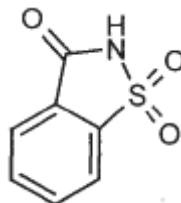
- U.S. Environmental Protection Agency. 2012. Ecological Effects Test Guidelines, OCSPP 850.6100, Environmental Chemistry Methods and Associated Independent Laboratory Validation. Office of Chemical Safety and Pollution Prevention, Washington, DC. EPA 712-C-001.
- 40 CFR Part 136. Appendix B. Definition and Procedure for the Determination of the Method Detection Limit-Revision 1.11, pp. 317-319.

Attachment 1: Chemical Names and Structures**Sulfometuron methyl (DPX-T5648; Trade Name - Oust)**

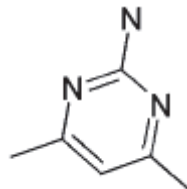
IUPAC Name: Not reported
CAS Name: Methyl 2-[[[(4,6-dimethyl-2-pyrimidinyl)-amino]carbonyl]amino]-sulfonyl]benzoate
CAS Number: 74222-97-2
SMILES String: Not found

**IN-00581 (Saccharin)**

IUPAC Name: Not reported
CAS Name: 1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide
CAS Number: 81-07-2
SMILES String: Not found

**IN-X0993**

IUPAC Name: Not reported
CAS Name: Not reported
CAS Number: Not reported
SMILES String: Not found



IN-D5803

IUPAC Name: Not reported
CAS Name: Not reported
CAS Number: Not reported
SMILES String: Not found

