

Test Material: XDE-848 Benzyl Ester

MRID: 49677775

Title: Method Validation Study for the Determination of Residues of XDE-848 Benzyl Ester and Three Metabolites (X11438848, X12300837 and X11966341) in Soil and Sediment by Liquid Chromatography with Tandem Mass Spectrometry

MRID: 49677776

Title: Independent Laboratory Validation of a Dow AgroSciences Method for the Determination of XDE-848 Benzyl Ester and Three Metabolites (X11438848, X12300837 and X11966341) in Soil

EPA PC Code: 030093

OCSPP Guideline: 850.6100

For CDM Smith

Primary Reviewer: Lisa Muto

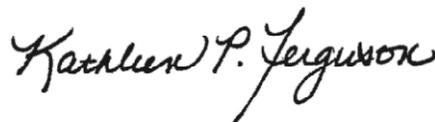
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Date: 2/26/16

Secondary Reviewer: Kathleen Ferguson

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Date: 2/26/16

QC/QA Manager: Joan Gaidos

Signature:



Date: 2/26/16

Analytical method for XDE-848 benzyl ester and its transformation products, X11438848, X12300837 and X11966341, in soil and sediment

Reports: ECM: EPA MRID No.: 49677775. Huang, T-Y, M.J. Walter. 2015. Method Validation Study for the Determination of Residues of XDE-848 Benzyl Ester and Three Metabolites (X11438848, X12300837 and X11966341) in Soil and Sediment by Liquid Chromatography with Tandem Mass Spectrometry. Laboratory Study ID: 140956. Report prepared, sponsored and submitted by Dow AgroSciences LLC, Indianapolis, Indiana; 290 pages. Final report issued August 4, 2015.
ILV: EPA MRID No. 49677776. Austin, R. 2015. Independent Laboratory Validation of a Dow AgroSciences Method for the Determination of XDE-848 Benzyl Ester and Three Metabolites (X11438848, X12300837 and X11966341) in Soil. Dow AgroSciences Protocol No.: 140959. Battelle Study No.: YR/14/026. Report prepared by Battelle UK Ltd., Essex, United Kingdom, and sponsored and submitted by Dow AgroSciences LLC, Indianapolis, Indiana; 87 pages. Final report issued July 30, 2015.

Document No.: MRIDs 49677775 & 49677776

Guideline: 850.6100

Statements: ECM: The study was conducted in accordance with USEPA FIFRA Good Laboratory Practices (GLP; 1998; p. 3 of MRID 49677775). Signed and dated No Data Confidentiality, GLP, and Quality Assurance statements were provided (pp. 2-4). A statement of the authenticity of the study report was included with the quality assurance statement (p. 4).
ILV: The study was conducted in accordance with USEPA and OECD GLP standards (1998), as well as the UK Department of Health (Directive 2004/9/EC; p. 3; Appendix 3, p. 87 of MRID 49677776). Signed and dated No Data Confidentiality, GLP, Quality Assurance and Authenticity statements were provided (pp. 2-4; Appendix 3, p. 87). A statement of the authenticity of the study report was included with the quality assurance statement (p. 4).

Classification: This analytical method is considered unacceptable. The LOQs are greater than the lowest toxicological level of concern in soil for XDE-848 benzyl ester and metabolites. In the ILV, no samples were prepared at 10×LOQ; a minimum of five spiked replicates should be analyzed at each concentration (*i.e.*, minimally, the LOQ and 10×LOQ) for each analyte. In lieu of 10×LOQ, the ILV presents results at 100×LOQ. The sets of representative chromatograms were incomplete in the ECM and ILV. In the ILV, only a soil was tested (no sediment), and it is not known whether the most difficult matrix was selected. A justification for the selection of soil should be provided. Given all the issues found in the study, a new study is required.

PC Code: 030093

Reviewer: José Meléndez **Date:** November 8, 2016

Signature:

Executive Summary

The analytical method, Dow AgroSciences Protocol No. 140956, is designed for the quantitative determination of florpyrauxifen-benzyl (XDE-848, XDE-848 BE; XDE-848 benzyl ester) and the three metabolites X11966341, X12300837, and X11438848 in soil matrices at the LOQ of 0.003 µg/g using LC/MS/MS. The LOQs are greater than the lowest toxicological level of concern in soil for XDE-848 and its three metabolites.¹ The ECM was validated by the ILV in the first trial for all four analytes in one soil matrix with insignificant modifications to the analytical parameters; however, no samples were prepared at 10×LOQ in the ILV. The soil matrices were adequately characterized in the ECM and ILV; however, it could not be determined if the ILV was provided with the most difficult matrix with which to validate the method since three ECM matrices contained higher clay content. Sample recoveries were corrected in the ECM, but residues in the controls were insignificant.

Table 1. Analytical Method Summary¹

Analyte(s) by Pesticide	MRID		EPA Review	Matrix	Method Date (day/month/year)	Registrant	Analysis	Limit of Quantitation (LOQ)
	Environmental Chemistry Method	Independent Laboratory Validation						
Florpyrauxifen-benzyl (X11959130)	49677775	49677776		Soil, Sediment _{2,3}	04/08/2015	Dow AgroSciences LLC	LC/MS/MS	0.003 µg/g (0.003 ppm)
XDE-848 hydroxy acid (X11966341)								
XDE-848 benzyl hydroxy (X12300837)								
XDE-848 acid (X11438848)								

1 Florpyrauxifen-benzyl = [XDE-848; XDE-848 BE; XDE-848 benzyl ester; TSN301734; X11959130; SX-1552; benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylate]; X11966341 = [XDE-848 hydroxy acid; TSN305649; 1552-OHA; 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylic acid]; X12300837 = [XDE-848 hydroxy benzyl ester; TSN305650; 1552-OHBE; benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylate]; and X11438848 = [XDE-848 acid; TSN301691; 1552-Acid; 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylic acid].

2 For the ECM, clay (001; 28% sand, 27% silt, 45% clay; pH 7.8, organic carbon 4.7%), loam (002; 43% sand, 32% silt, 25% clay; pH 7.4, organic carbon 3.6%), sandy loam (003; 81% sand, 6% silt, 13% clay; pH 4.2, organic carbon 2.4%) and sand (004; 97% sand, 2% silt, 1% clay; pH 4.8, organic carbon 0.8%) soils and clay loam (005; 49% sand, 14% silt, 37% clay; pH 8.3, organic carbon 0.4%) and silt loam (006; 53% sand, 40% silt, 7% clay; pH 6.9, organic carbon 8.1%) sediments were used in the study (Table 2, p. 31 of MRID 49677775).

3 For the ILV, sandy loam soil (Soil 13/006 Lufa 2.2 Residues; 74% sand, 13% silt, 13% clay; pH 5.4, organic matter 3.17%) was used in the study (p. 17; Appendix 2, p. 86 of MRID 49677776).

¹ The soil toxicological level of concern was calculated as follows: $[4.69 \times 10^{-5} \text{ lb a.i./acre}] \times [1/6 \text{ inches}] \times [1/1.33 \text{ kg/L}] \times [4.54 (10^5) \text{ mg/lb}] \times [3.94 \text{ inches/dm}] \times [2.47 (10^{-6}) \text{ acres/dm}^2] = 3 \times 10^{-5} \text{ mg a.i./kg soil} = 3 \times 10^{-5} \text{ µg/g}$. Meanwhile, this method's LOQ is greater, at $3 \times 10^{-3} \text{ µg/g}$. Assumptions: a 6-inch soil depth (default value), a soil bulk density of 1.33 kg/L (from the study MRID 49677762), and lowest endpoint $EC_{25} = 4.69 \times 10^{-5} \text{ lb a.i./acre}$, for dicots (for carrots, from the ecotoxicity study MRID 49677762).

I. Principle of the Method

Samples (5 g) of soil/sediment in 50-mL Nalgene centrifuge tubes were fortified, as necessary, then mixed via gently hand-shaking for soil or via vortex (5-10 seconds) for sediment (p. 18; Appendix I, pp. 281, 287-289 of MRID 49677775). The sample was mixed with 20 mL of extraction solution [acetonitrile:0.1N hydrochloric acid (90:10, v:v) for soil; acetonitrile:water:formic acid (90:9.5:0.5, v:v:v) for sediment] via vortex. The sample was shaken for 30 minutes on a flatbed shaker (280 excursions/min.). After centrifugation (5 minutes at 2000 rpm), the solution was decanted into a 125 Nalgene bottle. The extraction process was repeated three more times with 15 mL of extraction solution. After the final extraction, the volume of the sample extract was adjusted to 70 mL with extraction solution. An aliquot (2 mL) of the sample extract was transferred to a 16 x 100 mm culture tube. 1 N HCl (20 μ L) and the keeper [50 μ L of glycerol:methanol (10:90, v:v)] was added to the aliquot, mixing via vortex (5 seconds) between each addition. The sample was evaporated to 200-300 μ L on a Turbo-Vap set at 40°C with 7 psi nitrogen (approximately 15 minutes). Acetonitrile:methanol (50:50, v:v, 500 μ L) and water containing 0.1% formic acid (2 mL) was added to the remaining sample, mixing via vortex (5-10 seconds) between each addition. The sample was purified using an Oasis HLB solid phase extraction (SPE) cartridge (60-mg, 3cc). The SPE column was pre-conditioned with acetonitrile:methanol (50:50, v:v) and water containing 0.1% formic acid (3 mL) with full vacuum for 5 seconds after each elution. The sample was applied to the column (*ca.* 0.5 mL/min rate) with full vacuum for 5 seconds after elution; the eluate was discarded. The vial was rinsed with 1.0 mL of methanol:water (10:90, v:v) and the solution was applied to the column (*ca.* 0.5 mL/min rate), with full vacuum for 5 seconds after elution. After drying the column with full vacuum for 5 minutes, the analytes were eluted with 4 x 1.5-mL aliquots as follows: 2 x 0.5-mL aliquots of acetonitrile:methanol (50:50, v:v) were added to the sample vial for rinsing then applied to the SPE column; and 2 x 0.5-mL aliquots of acetonitrile:methanol (50:50, v:v) were applied directly to the SPE column (the method noted that this was a critical step to remove analytes from the sides of the glass tube). The analytes were eluted via gravity with full vacuum for 5 seconds after each elution. The keeper [50 μ L of glycerol:methanol (10:90, v:v)] and mixed internal standard (100 μ L of 0.01 μ g/mL mixed XDE-848 internal standard) was added to the eluate. After vortexing gently, the sample was evaporated to dryness on a Turbo-Vap set at 40°C with 7 psi nitrogen (approximately 30-40 minutes). The residue was reconstituted with 1000 μ L of acetonitrile:methanol:formic acid (50:50:0.1, v:v:v). After vortexing, 1 mL of acetonitrile:methanol (50:50, v:v) was added to the sample (the method noted that this was a critical step to remove analytes from the sides of the glass tube). After vortexing for 5-10 seconds, 1 mL of water containing 0.1% formic acid was added to the sample. After vortexing for 5-10 seconds, an aliquot of the sample was transferred to a LC/MS/MS vial for analysis.

The method noted that XDE-848 benzyl ester has carryover so a blank injection is required after each sample with concentrations above 5 ng/mL (Appendix I, pp. 289-290 of MRID 49677775). Additionally, the method noted that class A volumetric glassware is to be used unless specifically noted otherwise and samples with concentrations >80% of the highest standard should be diluted.

Samples were analyzed for XDE-848 and its metabolites using an Agilent 1290 Infinity LC system coupled to an AB Sciex API5500 LC/MS/MS (Appendix I, pp. 285-286 of MRID

49677775). The instrumental conditions consisted of a Phenomenex Kinetex 1.7 μ PFP 100A column (100 x 2.1 mm, 1.7- μ m; column temperature ambient, *ca.* 20°C), Phenomenex SecurityGuard ULTRA UHPLC PFP for 2.1 ID columns, a gradient mobile phase of (A) water containing 0.1% formic acid and (B) methanol containing 0.1% formic acid [percent A:B (v:v) at -3.0-0.0 min. 50.0:50.0, 8.0-9.0 min. 0.0:100.0], MS/MS detection in positive electrospray mode MS (MRM; temperature, 500°C), and injection volume 10 μ L. Two parent-daughter ion transitions were monitored per analyte (quantification and confirmation, respectively): m/z 441.0 \rightarrow 65.0 and m/z 441.0 \rightarrow 91.0 for XDE-848 BE; m/z 334.9 \rightarrow 254.0 and m/z 336.9 \rightarrow 256.0 for XDE-848 HA (X11966341); m/z 425.0 \rightarrow 90.9 and m/z 427.0 \rightarrow 90.9 for XDE-848 BH (X12300837); and m/z 349.0 \rightarrow 267.9 and m/z 349.0 \rightarrow 225.1 for XDE-848 Acid (X11438848; Tables 25-40, pp. 87-126; Appendix 1, p. 286). Retention times were observed at *ca.* 5.75, 1.8, 4.9, and 3.0 min. for XDE-848 BE, XDE-848 HA, XDE-848 BH and XDE-848 Acid, respectively (Figures 57-125, pp. 209-277).

In the ILV, the sample processing of the ECM was performed exactly as written (pp. 13-14; Appendix 1, pp. 79-80, 82-85 of MRID 49677776). Samples were analyzed for XDE-848 and its metabolites using an Agilent 1290 Infinity LC system coupled to an AB Sciex QTRAP 6500 LC/MS/MS. All instrumental parameters were the same, except for the following: gradient of mobile phase [percent A:B (v:v) at 0.00 min. 50:50, 8.00-10.00 min. 0:100, 10.10-13.00 min. 50:50], MS/MS detection in positive Turbo Spray IonDrive mode MS (MRM; temperature, 500°C), and injection volume 30 μ L. Two parent-daughter ion transitions were monitored per analyte (quantification and confirmation, respectively): m/z 441 \rightarrow 65 and m/z 441 \rightarrow 91 for XDE-848 BE; m/z 335 \rightarrow 254 and m/z 337 \rightarrow 256 for X11966341; m/z 425 \rightarrow 91 and m/z 427 \rightarrow 91 for X12300837; and m/z 349 \rightarrow 268 and m/z 349 \rightarrow 225 for X11438848 (transitions were generally the same from the ECM). Retention times were observed at *ca.* 6.4, 2.1, 5.6, and 3.4 min. for XDE-848 BE, X11966341, X12300837, and X11438848, respectively (Figures 26-37, pp. 66-77; Appendix 1, p. 84). The ILV study author noted that the increase in the injection volume was due to poor sensitivity at the lower injection volume (p. 17). The ILV study author also noted that the critical steps (SPE elution and reconstitution) were noted as critical in the ECM (p. 15). None of the minor ILV modifications to the instrumental parameters had an effect on the outcome of the study.

LOQ/LOD

The LOQ and LOD in the ECM and ILV were 0.003 μ g/g and 0.9 ng/g, respectively, for XDE-848 benzyl ester and the three metabolites of XDE-848 benzyl ester (pp. 18, 24; Tables 17-24, pp. 83-86 of MRID 49677775; pp. 12, 18 of MRID 49677776).

II. Recovery Findings

ECM (MRID 49677775): Mean recoveries and relative standard deviations (RSDs) were within guidelines (mean 70-120%; RSD \leq 20%) for analysis of XDE-848 (XDE-848 BE; XDE-848 benzyl ester) and its three metabolites, X11966341, X12300837, and X11438848, in four soil and two sediment matrices at fortification levels of 0.003 $\mu\text{g/g}$ (LOQ), 0.03 $\mu\text{g/g}$ (10 \times LOQ) and 0.3 $\mu\text{g/g}$ (100 \times LOQ; Tables 41-48, pp. 127-134). For all analytes, two ion transitions were monitored using LC/MS/MS; performance data (recovery results) of the quantitative and confirmatory results were comparable. The ECM recovery data was not separated by soil/sediment matrix in the study report for calculations (see Reviewer's Comment #5). The recovery ranges for all combined soils or sediments were fairly narrow (generally 20%); therefore, it appears that no new conclusions/trends would have been produced from separation of recovery data based on soil matrix. The ECM calculations allowed for recovery data to be corrected for residues found in the control samples; however, only insignificant residues (\leq 10% of the LOD) were quantified in control samples (Tables 25-40, pp. 87-126; Figures 17-25, pp. 169-177). Mean recoveries and RSDs for samples fortified at 0.0009 $\mu\text{g/g}$ (LOD) were acceptable (70-120%; RSD \leq 20%) for all analyses, except for XDE-848 BE in soils (RSD 21%; n = 8 for soil matrices and n = 4 for sediment matrices; data for each soil/sediment matrix combined in reviewer calculations; Tables 25-40, pp. 87-126; DER Attachment 2). The soil/sediment matrices were well characterized at and obtained from the Sample Management Group of Dow AgroSciences LLC (sources not further specified; p. 19; Table 2, p. 31). Clay (001; 28% sand, 27% silt, 45% clay; pH 7.8, organic carbon 4.7%), loam (002; 43% sand, 32% silt, 25% clay; pH 7.4, organic carbon 3.6%), sandy loam (003; 81% sand, 6% silt, 13% clay; pH 4.2, organic carbon 2.4%) and sand (004; 97% sand, 2% silt, 1% clay; pH 4.8, organic carbon 0.8%) soils and clay loam (005; 49% sand, 14% silt, 37% clay; pH 8.3, organic carbon 0.4%) and silt loam (006; 53% sand, 40% silt, 7% clay; pH 6.9, organic carbon 8.1%) sediments were used in the study.

ILV (MRID 49677776): Mean recoveries and relative standard deviations (RSDs) were within guidelines for analysis of XDE-848 (XDE-848 BE; XDE-848 benzyl ester) and its three metabolites, X11966341, X12300837, and X11438848, in one soil matrix at fortification levels of 0.003 $\mu\text{g/g}$ (LOQ) and 0.3 $\mu\text{g/g}$ (100 \times LOQ; uncorrected recovery results; Tables 10-17, pp. 27-34; Figure 17, p. 57). No samples were prepared at 10 \times LOQ. For all analytes, two ion transitions were monitored using LC/MS/MS; performance data (recovery results) of the quantitative and confirmatory results were comparable. Recoveries from samples fortified at 0.009 $\mu\text{g/g}$ (LOD) ranged (ions/matrices combined) from 100-119% for all analytes (n = 1 for each matrix/analyte; Tables 10-17, pp. 27-34; DER Attachment 2). The soil matrix was well characterized by Agvise Laboratories, Northwood, North Dakota (soil matrices were well characterized (USDA texture classification; p. 17; Appendix 2, p. 86). Sandy loam soil (Soil 13/006 Lufa 2.2 Residues; 74% sand, 13% silt, 13% clay; pH 5.4, organic matter 3.17%) was used in the study. The method was validated in the first trial for all analytes with insignificant modifications to the analytical parameters (p. 18).

Table 2. Initial Validation Method Recoveries for XDE-848 (XDE-848 BE; XDE-848 Benzyl Ester) and Its Three Metabolites, X11966341, X12300837, and X11438848, in Four Soils and Two Sediments^{1,2,3}

Analyte	Fortification Level (µg/g)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
Four Soils (Clay, Loam, Sandy Loam and Sand)						
Quantitation ion transition						
XDE-848 (XDE-848 BE; XDE-848 Benzyl Ester)	0.0009 (LOD)	8	70-122	95	16	17
	0.003 (LOQ)	40	83-114	97	6.67	6.88
	0.03	24	94-106	100	3.26	3.28
	0.3	40	95-107	101	2.89	2.88
X11966341	0.0009 (LOD)	8	72-122	95	20	21
	0.003 (LOQ)	40	73-103	88	8.66	9.86
	0.03	24	75-100	89	7.88	8.85
	0.3	40	80-107	92	6.49	7.01
X12300837	0.0009 (LOD)	8	80-111	100	12	12
	0.003 (LOQ)	40	81-104	95	5.85	6.14
	0.03	24	92-110	98	4.10	4.18
	0.3	40	93-106	99	3.24	3.28
X11438848	0.0009 (LOD)	8	81-108	93	9	9
	0.003 (LOQ)	40	83-108	95	5.19	5.48
	0.03	24	88-103	95	4.47	4.71
	0.3	40	86-108	98	4.90	5.01
Confirmation ion transition						
XDE-848 (XDE-848 BE; XDE-848 Benzyl Ester)	0.0009 (LOD)	8	77-106	94	9	10
	0.003 (LOQ)	40	86-108	97	4.79	4.92
	0.03	24	93-106	100	3.39	3.37
	0.3	40	95-107	101	2.42	2.39
X11966341	0.0009 (LOD)	8	70-122	86	17	20
	0.003 (LOQ)	40	74-107	88	8.62	9.79
	0.03	24	75-103	90	7.65	8.51
	0.3	40	80-108	93	7.15	7.73
X12300837	0.0009 (LOD)	8	95-108	100	5	5
	0.003 (LOQ)	40	89-107	96	3.49	3.64
	0.03	24	92-107	98	4.08	4.15
	0.3	40	89-107	99	3.58	3.63
X11438848	0.0009 (LOD)	8	82-122	97	13	14
	0.003 (LOQ)	40	85-106	95	5.54	5.81
	0.03	24	86-105	95	4.76	5.02
	0.3	40	85-109	98	5.12	5.23

Analyte	Fortification Level (µg/g)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
Two Sediments (Clay Loam and Silt Loam)						
Quantitation ion transition						
XDE-848 (XDE-848 BE; XDE-848 Benzyl Ester)	0.0009 (LOD)	4	76-106	92	16	17
	0.003 (LOQ)	20	79-104	92	5.83	6.32
	0.03	12	89-107	98	4.39	4.50
	0.3	20	93-108	99	3.82	3.85
X11966341	0.0009 (LOD)	4	90-122	100	15	15
	0.003 (LOQ)	20	82-106	93	6.07	6.54
	0.03	12	86-100	93	4.60	4.97
	0.3	20	83-103	95	5.27	5.52
X12300837	0.0009 (LOD)	4	88-106	99	8	8
	0.003 (LOQ)	20	85-106	95	5.00	5.26
	0.03	12	92-104	98	3.53	3.59
	0.3	20	93-105	99	3.37	3.40
X11438848	0.0009 (LOD)	4	85-105	95	9	9
	0.003 (LOQ)	20	80-104	92	6.69	7.24
	0.03	12	88-100	95	3.34	3.51
	0.3	20	89-105	98	5.01	5.10
Confirmation ion transition						
XDE-848 (XDE-848 BE; XDE-848 Benzyl Ester)	0.0009 (LOD)	4	86-106	97	9	9
	0.003 (LOQ)	20	76-105	94	7.77	8.27
	0.03	12	87-104	99	4.23	4.29
	0.3	20	96-109	100	3.52	3.51
X11966341	0.0009 (LOD)	4	71-90	78	9	11
	0.003 (LOQ)	20	77-109	94	8.89	9.47
	0.03	12	84-101	94	5.60	5.98
	0.3	20	82-104	96	5.57	5.80
X12300837	0.0009 (LOD)	4	85-106	95	9	10
	0.003 (LOQ)	20	86-104	95	4.46	4.70
	0.03	12	91-103	99	4.12	4.17
	0.3	20	95-104	99	2.45	2.48
X11438848	0.0009 (LOD)	4	81-110	96	13	13
	0.003 (LOQ)	20	78-108	91	7.27	8.01
	0.03	12	87-101	95	4.22	4.45
	0.3	20	91-107	98	4.73	4.85

Data (recovery results corrected for residues found in the controls; Figures 17-25, pp. 169-177) were obtained from Tables 25-40, pp. 87-126 (LOD results) and Tables 41-48, pp. 127-134 (Summary Results) of MRID 49677775 and

DER Attachment 2 (LOD calculations). Means, s.d. and RSDs for LOD samples were reviewer-calculated (see DER Attachment 2). Results were not separated based on soil/sediment texture (see Reviewer's Comment #5).

- 1 Florpyrauxifen-benzyl = [XDE-848; XDE-848 BE; XDE-848 benzyl ester; TSN301734; X11959130; SX-1552; benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylate]; X11966341 = [XDE-848 hydroxy acid; TSN305649; 1552-OHA; 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylic acid]; X12300837 = [XDE-848 hydroxy benzyl ester; TSN305650; 1552-OHBE; benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylate]; and X11438848 = [XDE-848 acid; TSN301691; 1552-Acid; 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylic acid].
- 2 The soil matrices were well characterized (USDA texture classification; Table 2, p. 31). Clay (001; 28% sand, 27% silt, 45% clay; pH 7.8, organic carbon 4.7%), loam (002; 43% sand, 32% silt, 25% clay; pH 7.4, organic carbon 3.6%), sandy loam (003; 81% sand, 6% silt, 13% clay; pH 4.2, organic carbon 2.4%) and sand (004; 97% sand, 2% silt, 1% clay; pH 4.8, organic carbon 0.8%) soils and clay loam (005; 49% sand, 14% silt, 37% clay; pH 8.3, organic carbon 0.4%) and silt loam (006; 53% sand, 40% silt, 7% clay; pH 6.9, organic carbon 8.1%) sediments were used in the study.
- 3 Two parent-daughter ion transitions were monitored per analyte (quantification and confirmation, respectively): m/z 441.0 \rightarrow 65.0 and m/z 441.0 \rightarrow 91.0 for XDE-848 BE; m/z 334.9 \rightarrow 254.0 and m/z 336.9 \rightarrow 256.0 for XDE-848 HA (X11966341); m/z 425.0 \rightarrow 90.9 and m/z 427.0 \rightarrow 90.9 for XDE-848 BH (X12300837); and m/z 349.0 \rightarrow 267.9 and m/z 349.0 \rightarrow 225.1 for XDE-848 Acid (X11438848; Tables 25-40, pp. 87-126; Appendix 1, p. 286)..

Table 3. Independent Validation Method Recoveries for XDE-848 (XDE-848 BE; XDE-848 Benzyl Ester) and Its Three Metabolites, X11966341, X12300837, and X11438848, in Soil^{1,2}

Analyte	Fortification Level (µg/g)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
Sandy Loam Soil						
Quantitation ion transition						
XDE-848 (XDE-848 BE; XDE-848 Benzyl Ester)	0.0009 (LOD)	1	109	--	--	--
	0.003 (LOQ)	5	111-122	116	4.4	3.8
	0.3	5	101-111	106	3.7	3.5
X11966341	0.0009 (LOD)	1	100	--	--	--
	0.003 (LOQ)	5	97-109	105	4.5	4.3
	0.3	5	98-107	104	3.5	3.4
X12300837	0.0009 (LOD)	1	110	--	--	--
	0.003 (LOQ)	5	113-118	115	1.9	1.7
	0.3	5	101-106	104	1.9	1.8
X11438848	0.0009 (LOD)	1	107	--	--	--
	0.003 (LOQ)	5	104-113	109	3.4	3.1
	0.3	5	98-107	103	3.3	3.2
Confirmation ion transition						
XDE-848 (XDE-848 BE; XDE-848 Benzyl Ester)	0.0009 (LOD)	1	111	--	--	--
	0.003 (LOQ)	5	113-120	117	3.1	2.7
	0.3	5	100-109	105	3.5	3.4
X11966341	0.0009 (LOD)	1	114	--	--	--
	0.003 (LOQ)	5	101-109	107	3.4	3.2
	0.3	5	100-108	104	3.9	3.8
X12300837	0.0009 (LOD)	1	106	--	--	--
	0.003 (LOQ)	5	109-118	112	3.8	3.4
	0.3	5	101-108	105	2.6	2.5
X11438848	0.0009 (LOD)	1	119	--	--	--
	0.003 (LOQ)	5	99-112	108	5.5	5.1
	0.3	5	99-107	103	3.0	2.9

Data (uncorrected recovery results; Figure 17, p. 57) were obtained from Tables 10-17, pp. 27-34 (LOD results) and Tables 18-25, pp. 35-36 of MRID 49677776 and DER Attachment 2 (LOD calculations).

1 Florpyrauxifen-benzyl = [XDE-848; XDE-848 BE; XDE-848 benzyl ester; TSN301734; X11959130; SX-1552; benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylate]; X11966341 = [XDE-848 hydroxy acid; TSN305649; 1552-OHA; 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylic acid]; X12300837 = [XDE-848 hydroxy benzyl ester; TSN305650; 1552-OHBE; benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylate]; and X11438848 = [XDE-848 acid; TSN301691; 1552-Acid; 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylic acid].

- 2 The soil matrix was well characterized (USDA texture classification; p. 17; Appendix 2, p. 86). Sandy loam soil (Soil 13/006 Lufa 2.2 Residues; 74% sand, 13% silt, 13% clay; pH 5.4, organic matter 3.17%) was used in the study.
- 3 Two parent-daughter ion transitions were monitored per analyte (quantification and confirmation, respectively): m/z 441 \rightarrow 65 and m/z 441 \rightarrow 91 for XDE-848 BE; m/z 335 \rightarrow 254 and m/z 337 \rightarrow 256 for X11966341; m/z 425 \rightarrow 91 and m/z 427 \rightarrow 91 for X12300837; and m/z 349 \rightarrow 268 and m/z 349 \rightarrow 225 for X11438848 (transitions were generally the same from the ECM).

III. Method Characteristics

In the ECM and ILV, the established LOQ and LOD were 0.003 $\mu\text{g/g}$ and 0.9 ng/g , respectively, for XDE-848 and the three metabolites of XDE-848 (pp. 18, 24, 28; Tables 17-24, pp. 83-86 of MRID 49677775; pp. 12, 18 of MRID 49677776). Following the method of Keith, L. H., *et al.* (see section **V. References** below), the LOD and LOQ for determination of XDE-848 and its metabolites in soil were calculated in the ECM using the standard deviation from the 0.003 $\mu\text{g/g}$ recovery results. The LOD was calculated as three times the standard deviation ($3s$), and the LOQ was calculated as ten times the standard deviation ($10s$) of the recovery results. The calculated values of the ECM support the LOQ and LOD established for the study and are presented in **Table 4** below. In the ILV, the LOQ and LOD were reported from the ECM without justification or calculation.

Table 4. Method Characteristics

		XDE-848 (XDE-848 BE)	X11966341	X12300837	X11438848
Limit of Quantitation (LOQ)	Established	0.003 µg/g			
	Calculated (ECM)	0.00144-0.00233 µg/g	0.00182-0.00266 µg/g	0.00105-0.00175 µg/g	0.00156-0.00218 µg/g
Limit of Detection (LOD)	Established	0.0009 µg/g			
	Calculated (ECM)	0.000431-0.000699 µg/g	0.000545-0.000799 µg/g	0.000314-0.000526 µg/g	0.000467-0.000653 µg/g
Linearity (Least squares calibration curve r and concentration range)	ECM ¹	$r^2 = 0.9994-1.0000$ (Q & C)	$r^2 = 0.9990-0.9998$ (Q) $r^2 = 0.9988-0.9998$ (C)	$r^2 = 0.9990-1.0000$ (Q) $r^2 = 0.9992-1.0000$ (C)	$r^2 = 0.9968-1.0000$ (Q) $r^2 = 0.9972-0.9998$ (C)
		0.05-20.0 ng/mL			
	ILV ¹	$r^2 = 0.9998$ (Q & C)	$r^2 = 0.9994$ (Q) $r^2 = 0.9992$ (C)	$r^2 = 0.9992$ (Q) $r^2 = 0.9990$ (C)	$r^2 = 0.9984$ (Q & C)
		0.03-4.0 ng/mL	0.075-10 ng/mL		
Repeatable	ECM ²	Soil	Yes at LOQ (n = 40), 10×LOQ (n = 24) and 100×LOQ (n = 40). Four soil matrices; recovery results were not separated by matrix.		
		Sediment	Yes at LOQ (n = 20), 10×LOQ (n = 12) and 100×LOQ (n = 20). Two sediment matrices; recovery results were not separated by matrix.		
	ILV ³	Yes at LOQ and 100×LOQ (n = 5). No at 10×LOQ, no samples were prepared. One soil matrix.			
Reproducible	Yes at LOQ and 100×LOQ (n = 5). No at 10×LOQ, no samples were prepared.				
Specific	ECM	Yes, only minor interferences (<5% of the LOQ) at the retention time of the analytes were observed in the matrix controls. Residues in the matrix controls were quantified as <LOQ. No representative chromatograms were provided for the reagent blank and fortifications at the LOD or 10×LOQ, only calibrants, controls, LOQ and 100×LOQ. Peaks were well defined and distinct from the baseline.			
	ILV	Yes, only minor interferences (<10% of the LOQ) at the retention time of the analytes were observed in the matrix controls. Residues in the matrix controls were quantified as <LOD. No representative chromatograms were provided for the reagent blank and fortifications at the LOD or 100×LOQ, only calibrants, controls and LOQ.			

Data were obtained from pp. 18, 24, 28; Tables 17-24, pp. 83-86; Tables 17-24, pp. 83-86 (Correlation Coefficients); Tables 25-40, pp. 87-126 (Control residues and LOD results); Tables 25-40, pp. 87-126 (Individual Recovery Results); Tables 41-48, pp. 127-134 (Summary Recovery Results); Figures 34-125, pp. 186-277 (Chromatograms) of MRID 49677775; pp. 12, 18; Tables 10-17, pp. 27-34 (LOD results); Tables 2-9, pp. 23-26 (Correlation Coefficients); Tables 10-17, pp. 27-34 (Individual Recovery Data); Tables 18-25, pp. 35-36 (Summary Recovery Results); Figures 26-37, pp. 66-77 (Chromatograms) of MRID 49677776 and DER Attachment 2. Q = Quantitative HPLC analysis; C = Confirmatory HPLC analysis.

* Florpyrauxifen-benzyl = [XDE-848; XDE-848 BE; XDE-848 benzyl ester; TSN301734; X11959130; SX-1552; benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylate]; X11966341 = [XDE-848 hydroxy acid; TSN305649; 1552-OHA; 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylic acid]; X12300837 = [XDE-848 hydroxy benzyl ester; TSN305650; 1552-OHBE; benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylate]; and X11438848 = [XDE-848 acid; TSN301691; 1552-Acid; 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylic acid].

1 ECM and ILV standard curves were weighted $1/x$ for XDE-848, X11966341, X12300837, and X11438848. ECM r^2 values are reviewer-generated for the analytes from reported r values of 0.9984-1.0000 (Q) and 0.9986-1.0000 (C; analytes combined; calculated from data in Tables 17-24, pp. 83-86 and Figures 9-16, pp. 161-168 of MRID 49677775; see DER Attachment 2). ILV r^2 values are reviewer-generated for the analytes from reported r values of 0.9992-0.9999 (Q & C; analytes/ions combined; calculated from data in Tables 2-9, pp. 23-26 of MRID 49677776; see DER Attachment 2).

2 For the ECM, clay (001; 28% sand, 27% silt, 45% clay; pH 7.8, organic carbon 4.7%), loam (002; 43% sand, 32% silt, 25% clay; pH 7.4, organic carbon 3.6%), sandy loam (003; 81% sand, 6% silt, 13% clay; pH 4.2, organic carbon 2.4%) and sand (004; 97% sand, 2% silt, 1% clay; pH 4.8, organic carbon 0.8%) soils and clay loam (005; 49% sand, 14% silt, 37% clay; pH 8.3, organic carbon 0.4%) and silt loam (006; 53% sand, 40% silt, 7% clay; pH 6.9, organic carbon 8.1%) sediments were used in the study (Table 2, p. 31 of MRID 49677775).

3 For the ILV, sandy loam soil (Soil 13/006 Lufa 2.2 Residues; 74% sand, 13% silt, 13% clay; pH 5.4, organic matter 3.17%) was used in the study (p. 17; Appendix 2, p. 86 of MRID 49677776).

IV. Method Deficiencies and Reviewer's Comments

1. In the ILV, no samples were prepared at 10×LOQ (Tables 18-25, pp. 35-36 of MRID 49677776). OCSPP guideline requires that a minimum of five spiked replicates were analyzed at each concentration (*i.e.*, minimally, the LOQ and 10× LOQ) for each analyte.
2. In the ECM and ILV, representative chromatograms were not complete. In the ECM, representative chromatograms were not provided for the reagent blank and fortifications at the LOD or 10×LOQ, only calibrants, controls, LOQ and 100×LOQ (Figures 34-125, pp. 186-277 of MRID 49677775). A reagent blank was included in the validation (p. 22). In the ILV, representative chromatograms were not provided for the reagent blank and fortifications at the LOD or 100×LOQ, only calibrants, controls and LOQ (Figures 26-37, pp. 66-77 of MRID 49677776). A reagent blank was included in the validation (p. 15).
3. In the ILV, only one soil matrix was tested: sandy loam soil (Soil 13/006 Lufa 2.2 Residues; 74% sand, 13% silt, 13% clay; pH 5.4, organic matter 3.17%) was used in the study (p. 17; Appendix 2, p. 86 of MRID 49677776). It was not clear whether the ILV was provided, with the most difficult matrix with which to validate the method. In the ECM, soil and sediment matrices with higher clay were used, such as clay (001; 45% clay) and loam (25% clay) soils and clay loam (37% clay) sediment (Table 2, p. 31 of MRID 49677775).

Although the soil matrices were well characterized in the ECM and ILV, the specific soil source of each of the matrices was not reported (p. 17 of MRID 49677775; p. 13 of MRID 49677776).

4. In the ECM, sample recoveries were corrected. The ECM calculations allowed for recovery data to be corrected for residues found in the control samples; however, only insignificant residues ($\leq 10\%$ of the LOD) were quantified in control samples (Tables 25-40, pp. 87-126; Figures 17-25, pp. 169-177).
5. The ECM recovery data was not separated by soil/sediment matrix in the study report. The soil matrices and sediment matrices represented a range of soil characteristics, including % clay, pH and % organic carbon. The study author calculated statistics based on $n = 40$ for LOQ and 100×LOQ and $n = 24$ for 10×LOQ for soil, and $n = 20$ for LOQ and 100×LOQ and $n = 12$ for 10×LOQ for sediment. The number of samples per analyte/matrix were $n = 10$ for LOQ and 100×LOQ and $n = 6$ for 10×LOQ. The overall recovery range analytes/matrices/ions combined was 73-114% for all analytes at LOQ, 10×LOQ and 100×LOQ. For each analyte, the recovery ranges for all combined soils or sediments were fairly narrow, generally 20% although a few were up to 30%. Therefore, it appears that no new conclusions or trends would have been produced or observed from separation of recovery data based on soil matrix.
6. The toxicological level of concern was not reported for the analytes in soil. An LOQ above toxicological levels of concern results in an unacceptable method classification².

² The toxicological level of concern in soil was calculated by the EPA reviewer as follows: $[4.69 \times 10^{-5} \text{ lb a.i./acre}] \times [1/6 \text{ inches}] \times [1/1.33 \text{ kg/L}] \times [4.54 (10^5) \text{ mg/lb}] \times [3.94 \text{ inches/dm}] \times [2.47 (10^{-6}) \text{ acres/dm}^2] = 3 \times 10^{-5} \text{ mg a.i./kg}$

The LOD was reported as 0.9 ng/g, as well as 0.001 µg/g, in the ECM (p. 18, 24, 28; Tables 17-24, pp. 83-86 of MRID 49677775).

7. Isotopic internal standards or dechlorinated standards [$U\text{-}^{13}\text{C}$ -labeled in the phenyl ring], were used to determine isotopic crossover, as well as to facilitate analyses in the occurrence of matrix effects (pp. 19, 26-27 of MRID 49677775).
8. The ILV reported that no communications occurred between the ILV laboratory and the study director (p. 17 of MRID 49677776).
9. In the ECM, the stability of the calibration standards, stock solutions and sample extracts were studied. The calibration standards, stock solutions and spiking solutions of all analytes were stable for up to 158 days under refrigeration storage (pp. 24-25; Tables 49-60, pp. 135-140 of MRID 49677775). The final extracts of all analytes were stable for up to 7 days for matrices 003-006 and for up to 20 days for matrices 001-002 under refrigeration storage (pp. 25-26; Tables 61-64, pp. 141-144).

In the ECM and ILV, matrix effects were also studied (pp. 26-27; Tables 65-72, pp. 145-152 of MRID 49677775; pp. 16-17; Tables 26-29, pp. 37-40 of MRID 49677776). Matrix effects were determined to be significant (>20%) for some matrices/ions in the ECM; the use of internal standards was recommended. In the ILV, matrix effects were determined to be significant in some matrices (up to -35%), and the use of internal standards were considered necessary to reduce matrix effects.

10. It was reported for the ILV that the analytical procedure for one set of 19 samples (five calibration standards, two controls, one LOD sample, five LOQ samples, five 100×LOQ samples and one reagent blank) required approximately 6.5 hours for laboratory preparation (p. 15 of MRID 49677776). The LC/MS/MS was conducted unattended (8 hours or overnight). The interpretation of data required approximately 4 hours. The overall time to complete a set of samples (14 samples, not including calibration standards) was 1.5 calendar days.
11. The method noted that XDE-848 benzyl ester has carryover so a blank injection is required after each sample with concentrations above 5 ng/mL (Appendix I, pp. 289-290 of MRID 49677775). Additionally, the method noted that class A volumetric glassware is to be used unless specifically noted otherwise and samples with concentrations >80% of the highest standard should be diluted.

V. References

Keith, L.H.; Crummett, W.; Deegan, J., Jr.; Libby, R.A.; Taylor, J. K.; Wentler, G. *Anal. Chem.*

soil = 3×10^{-5} µg/g. Meanwhile, this method's LOQ is greater, at 3×10^{-3} µg/g. Assumptions: a 6-inch soil depth (default value), a soil bulk density of 1.33 kg/L (from the study MRID 49677762), and lowest endpoint EC_{25} = 4.69×10^{-5} lb a.i./acre for dicots (for carrots, from the ecotoxicity study MRID 49677762).

1983, 55, 2210-2218 (p. 26 of MRID 49677775).

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.

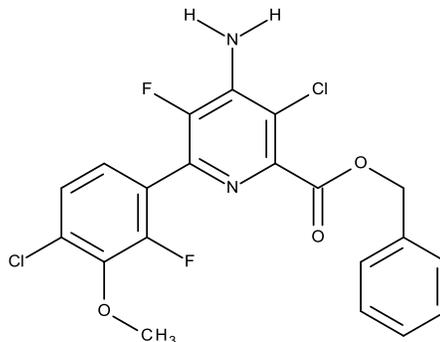
Attachment 1: Chemical Names and Structures**Florpyrauxifen-benzyl (XDE-848 Benzyl Ester, Rinskor™, XR-848-BE, XR-848 Benzyl, X11959130, TSN301734)**

IUPAC Name: Benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylate

CAS Name: Phenylmethyl ester 3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoro-2-pyridinecarboxylic acid

CAS Number: 1390661-72-9

SMILES String: [H]N([H])c1c(c(nc1Cl)C(=O)OCc2ccccc2)c3ccc(c(c3F)OC)Cl)F

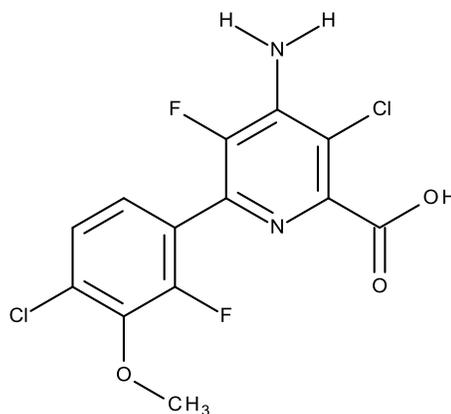
**XDE-848 acid (X11433848, TSN304667)**

IUPAC Name: 4-Amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoropyridine-2-carboxylic acid

CAS Name: --

CAS Number: --

SMILES String: [H]N([H])c1c(c(nc1Cl)C(=O)O)c2ccc(c(c2F)OC)Cl)F



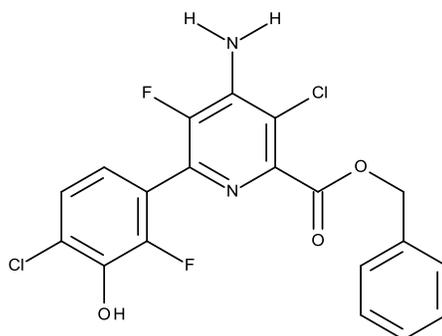
XDE-848 Hydroxy Benzyl Ester (X12300837; TSN305650; XDE-848 BH; Benzyl hydroxyl; 1552-OHBE; OHBE)

IUPAC Name: Benzyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylate

CAS Name: --

CAS Number: --

SMILES String: [H]N([H])c1c(c(nc(c1Cl)C(=O)OCc2ccccc2)c3ccc(c(c3F)O)Cl)F

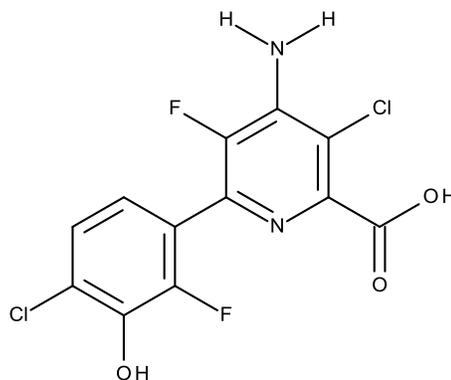
**XDE-848 Hydroxy Acid (X11966341; TSN305649; XDE-848 HA; Hydroxy acid; 1552-OHA; OHA)**

IUPAC Name: 4-Amino-3-chloro-6-(4-chloro-2-fluoro-3-hydroxyphenyl)-5-fluoropyridine-2-carboxylic acid

CAS Name: --

CAS Number: --

SMILES String: [H]N([H])c1c(c(nc(c1Cl)C(=O)O)c2ccc(c(c2F)O)Cl)F



Attachment 2: Calculations Spreadsheets

Chemical: XDE-848 (Florpyrauxifen-benzyl)

PC: 030093

MRIDs: 49677775/49677776

Guideline: 850.6100

ECM Recoveries at LOD of XDE-848 and its Products

Soil

XDE-848 BE								
Fortified (µg a.i./g)	Found (µg/L)	Recovery (%)	Mean (%)	SD ¹ (%)	RSD ² (%)	Max	Min	n =
0.0009	Quantiation ion							
	0.0008	86						
	0.0011	122						
	0.0009	97						
	0.0010	110						
	0.0006	70						
	0.0008	90						
	0.0008	87						
	0.0009	98	95	16	17	122	70	8
	Confirmation ion							
	0.0008	91						
	0.0009	95						
	0.0009	100						
	0.0010	106						
	0.0009	100						
	0.0009	95						
	0.0008	86						
	0.0007	77	94	9	9	106	77	9
	X11966341							
Fortified (µg a.i./g)	Found (µg/L)	Recovery (%)	Mean (%)	SD ¹ (%)	RSD ² (%)	Max	Min	n =
0.0009	Quantiation ion							
	0.0008	83						
	0.0007	80						
	0.0007	79						
	0.0007	72						
	0.0011	122						
	0.0010	111						
	0.0008	91						
	0.0011	122	95	20	21	122	72	8
	Confirmation ion							
	0.0007	72						
	0.0006	70						
	0.0011	122						
	0.0008	92						
	0.0008	83						
	0.0008	87						
	0.0007	73						
	0.0008	87	90	20	22	122	70	9
	X12300837							
Fortified (µg a.i./g)	Found (µg/L)	Recovery (%)	Mean (%)	SD ¹ (%)	RSD ² (%)	Max	Min	n =
0.0009	Quantiation ion							
	0.0010	110						

	0.0010	111						
	0.0010	108						
	0.0008	85						
	0.0007	80						
	0.0009	105						
	0.0009	103						
	0.0009	97	100	12	12	111	80	8
Confirmation ion								
	0.0009	95						
	0.0009	100						
	0.0010	108						
	0.0009	99						
	0.0009	95						
	0.0009	102						
	0.0010	106						
	0.0009	99	100	5	5	108	95	9
X11438848								
Fortified (µg a.i./g)	Found (µg/L)	Recovery (%)	Mean (%)	SD ¹ (%)	RSD ² (%)	Max	Min	n =
0.0009	Quantitation ion							
	0.0010	108						
	0.0009	102						
	0.0008	93						
	0.0008	88						
	0.0008	90						
	0.0008	88						
	0.0009	96						
	0.0007	81	93	9	9	108	81	8
Confirmation ion								
	0.0011	122						
	0.0010	107						
	0.0009	95						
	0.0008	92						
	0.0007	82						
	0.0008	90						
	0.0008	85						
	0.0009	101	95	13	14	122	81	9

Results from Tables 25-40, pp. 87-126 of MRID 49677775.

Sediment

XDE-848 BE									
Fortified (µg a.i./g)	Found (µg/L)	Recovery (%)	Mean (%)	SD ¹ (%)	RSD ² (%)	Max	Min	n =	
0.0009	Quantiation ion								
	0.0010	106							
	0.0007	81							
	0.0009	105							
	0.0007	76							
				92	16	17	106	76	4
	Confirmation ion								
	0.0009	101							
	0.0010	106							
	0.0008	86							
0.0009	95								
			97	9	9	106	86	4	
X11966341									
Fortified (µg a.i./g)	Found (µg/L)	Recovery (%)	Mean (%)	SD ¹ (%)	RSD ² (%)	Max	Min	n =	
0.0009	Quantiation ion								
	0.0008	92							
	0.0009	97							
	0.0011	122							
	0.0008	90							
				100	15	15	122	90	4
	Confirmation ion								
	0.0007	72							
	0.0008	90							
	0.0006	71							
0.0007	80								
			78	9	11	90	71	4	
X12300837									
Fortified (µg a.i./g)	Found (µg/L)	Recovery (%)	Mean (%)	SD ¹ (%)	RSD ² (%)	Max	Min	n =	
0.0009	Quantiation ion								
	0.0009	98							

	0.0008	88						
	0.0010	106						
	0.0009	103						
			99	8	8	106	88	4
Confirmation ion								
	0.0009	99						
	0.0008	86						
	0.0010	106						
	0.0008	89						
			95	9	10	106	86	4

X11438848

Fortified (µg a.i./g)	Found (µg/L)	Recovery (%)	Mean (%)	SD ¹ (%)	RSD ² (%)	Max	Min	n =
0.0009	Quantitation ion							
	0.0008	91						
	0.0009	98						
	0.0008	85						
	0.0009	105						
			95	9	9	105	85	4
Confirmation ion								
	0.0008	91						
	0.0009	103						
	0.0007	81						
	0.0010	110						
			96	13	13	110	81	4

Results from Tables 25-40, pp. 87-126 of MRID 49677775.

Chemical: XDE-848 (Florpyrauxifen-benzyl)
 PC: 030093
 MRIDs: 49677775/49677776
 Guideline: 850.6100

ECM Recoveries at LOD of XDE-848 and its Products

Fortified (µg a.i./g)	XDE-848 BE		X11966341		X12300837		X11438848	
	Found (µg/g)	Recovery (%)	Found (µg/g)	Recovery (%)	Found (µg/g)	Recovery (%)	Found (µg/g)	Recovery (%)
0.0009	Quantiation ion							
	0.00098	109	0.000897	100	0.00099	110	0.00097	107
	Confirmation ion							
	0.00100	111	0.001030	114	0.00095	106	0.00107	119

Results from Tables 10-17, pp. 27-34 of MRID 49677776.

Chemical: XDE-848
 PC: 030093
 MRIDs: 49677775/49677776
 Guideline: 850.6100

(Florpyrauxifen-benzyl)

ECM Calibration Curve Correlation Coefficients r (1/x weighting) converted to r2

Analyte	Water				
	First Ion Transition (Q)		Second Ion Transition (C)		
	Reported r	Calculated r2	Reported r	Calculated r2	
XDE-848 BE	1.0000	1.0000	1.0000	1.0000	High
	0.9997	0.9994	0.9997	0.9994	Low
X11966341	0.9999	0.9998	0.9999	0.9998	High
	0.9995	0.9990	0.9994	0.9988	Low
X12300837	1.0000	1.0000	1.0000	1.0000	High
	0.9995	0.9990	0.9996	0.9992	Low
X11438848	1.0000	1.0000	0.9999	0.9998	High
	0.9984	0.9968	0.9986	0.9972	Low

Results (r values) from Tables 17-24, pp. 83-86 and Figures 9-16, pp. 161-168 of MRID 49677775.

ILV Calibration Curve Correlation Coefficients r (1/x weighting) converted to r2

Analyte	Water				
	First Ion Transition (Q)		Second Ion Transition (C)		
	Reported r	Calculated r2	Reported r	Calculated r2	
XDE-848 BE	0.9999	0.9998	0.9999	0.9998	
X11966341	0.9997	0.9994	0.9996	0.9992	
X12300837	0.9996	0.9992	0.9995	0.9990	
X11438848	0.9992	0.9984	0.9992	0.9984	

Results (r values) from Tables 2-9, pp. 23-26 of MRID 49677802.