

**Bicyclopyrone; PC Code 018986;  
NOA449280; and SYN503780, CSCD656832, CSCD642512, CSCC163768, and CSAA806573  
ENVIRONMENTAL CHEMISTRY METHOD REVIEW REPORT**

**Residue Method for the Determination of NOA449280 and Metabolites SYN503780,  
CSCC163768, CSCD656832, CSCD642512 and CSAA806573 in soil.**

**Data Requirement:** EPA Guideline: 850.6100  
OECD Data Point: IIA 4.5

**Reports:** **Analytical Method:** MRID 47841953. Oppiliart, S. 2009. NOA449280 – Validation of Analytical Method GRM030.04A for the Determination of Residues of NOA449280 and Metabolites SYN503780, CSCD656832, CSCD642512, CSCC163768 and CSAA806573 in Soil. Report Number: TK0014608-REG. Study Number: S09-02700. Syngenta Task Number: TK0014608. Unpublished study prepared by Eurofins|ADME Bioanalyses 75 chemin de Sommières 30310 Vergèze, France. Submitted by Syngenta Crop Protection, LLC, Greensboro, NC.

**Independent Method Validation:** MRID 47841950. Hargreaves, S.L. and Mclean, N. 2009. NOA449280: Residue Analytical Method GRM030.04A for the Determination of NOA449280 and its Metabolites SYN503780, CSCD656832, CSCD642512, CSCC163768, CSAA806573 in Soil Final Determination by LC-MS/MS. Task no. T000993-08. Unpublished study prepared ALS Laboratory Group 9936 – 67<sup>th</sup> Avenue Edmonton, Alberta T6E 0P5 Canada. Submitted by Syngenta Crop Protection, LLC, Greensboro, NC.

**Independent Method Validation:** MRID 47841952. Hagan, M. 2009. NOAA449280 – Validation of Draft Method GRM030.04A for the Determination of NOAA 449280, SYN503780, CSCC163768, CSCD656832, CSCD642512 and CSAA806573 in Soil. Report Number: 09SYN256.REP. ALS Study Number: ALS09SYN01.PRO. Syngenta Study Number: T001384-09. Unpublished study prepared by ALS Laboratory Group 5424 - 97 Street Edmonton, Alberta T6E 5C1 CANADA. Submitted by Syngenta Crop Protection, LLC, Greensboro, NC.

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**Statements:** The study was conducted in compliance with GLP practices  
**Classification:** This analytical method is classified as **Fully Reliable** (EPA classification: Acceptable) for the determination of NOA449280 and metabolites SYN503780, CSCC163768, CSCD656832, CSCD642512 and CSAA806573 in soil. Additional analytical method validation data and ILV data for the parent and the major degradate SYN503780 have been submitted separately in MRIDs 47841949, 47841951 and 47842137, and have also been classified as **Fully Reliable** (EPA classification: Acceptable).

**PC Code:** 018986

**Primary Reviewer:** Paul Mastradone, Ph.D.  
Chemist (USEPA)

**Signature:**   
**Date:** June 30, 2014

**Secondary Reviewer:** Cheryl Sutton, Ph.D.  
Environmental Scientist (USEPA)

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**Date:** June 30, 2014

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**EXECUTIVE SUMMARY**

This analytical method, GRM030.04A, is designed for the quantitative determination of NOA449280 and metabolites SYN503780, CSCC163768, CSCD656832, CSCD642512 and CSAA806573 in soil. Fortified soil samples are extracted by heating and refluxing with 50:50 v/v acetonitrile/1M NH<sub>4</sub>OH. Aliquots are then evaporated to remove the acetonitrile. Aliquots are then subjected to solid phase extraction procedures. Final determination is by liquid chromatography with triple quadrupole mass spectrometric procedures. (LC-MS/MS)

**Table 1. Analytical Method Summary**

Analyte(s) by Pesticide	MRID		EPA Review	Matrix	Method Date	Registrant	Analysis	Limit of Quantitation (LOQ)
	Environmental Chemistry Method	Independent Laboratory Validation						
NOA449280 SYN503780 CSCC163768 CSCD656832 CSCD642512 CSAA806573	47841953 <sup>a</sup>	47841952 47841950 <sup>b</sup>	none	soil	10/23/2009	Syngenta	LC/MS-MS	>0.001 mg kg <sup>-1</sup>

<sup>a</sup>Although titled as a validation study it appears that MRID 47841953 presents the initial use of residue method GRM030.04A. <sup>b</sup>Although titled as an ILV, MRID 47841950 reports the same data as in the initial analytical method validation. Thus, it is not an independent validation of the method.



## **I. PRINCIPLE OF THE METHOD**

In order to verify method performance and allow recovery corrections to be made (if appropriate), fortified control samples should be included with each sample set. To each pre-weighed control soil sample, add the appropriate amount of standard solution containing NOA449280, SYN503780, CSCD656832, CSCD642512, CSCC163768 and CSAA806573 in ultrapure water. Let each sample stand for at least five minutes after fortification to allow the spiking solution to soak into the soil before proceeding with the extraction procedure. At least one untreated control and two fortified control samples should be analyzed with each sample set.

### **Extraction**

- a) Weigh a representative amount of soil (10 g) into a round bottom flask (100 mL size). Fortify samples as required at this point. Add 50:50 v/v acetonitrile:1 M NH<sub>4</sub>OH (50 mL) and record the weight of the flask and contents on a suitable balance. This allows correction for any loss of solvent due to evaporation during reflux.
- b) Place the flasks in a suitable electric heating mantle and securely attach a water-cooled reflux condenser to each flask. Heat at reflux for 1 hour then allow the samples to cool to room temperature with the condensers still attached.
- c) Carefully remove the condensers and flasks from the heating mantle and check the weight of the flask and contents. Any losses due to evaporation should be corrected for by addition of ultrapure water. Swirl the flask and contents to mix thoroughly.
- d) Decant the sample into a clean plastic centrifuge tube (50 mL size) and centrifuge at a speed that visibly separates the supernatant from the soil (*e.g.*, 4000 rpm) for 5 minutes. The sample concentration is 0.2 g/mL

### **Solid Phase Extraction (SPE) Procedure**

Note: This procedure has been developed using Chromabond HR-P SPE cartridges. Other manufacturers' styrene/divinylbenzene cartridges may be used provided they can be shown to be equivalent.

- a) Take one Chromabond HR-P SPE cartridge (500 mg, 3 mL) for each sample to be analysed and place on a suitable vacuum manifold (*e.g.* IST Vacmaster). Add 50:50 v/v acetonitrile:ultra pure water (2.5 mL) and allow to percolate through each cartridge under gravity or draw through under vacuum to the level of the top frit at a rate of approximately 1 mL/min, discarding the column eluate. Do not allow the cartridges to become dry. Add another 2.5 mL of 50:50 v/v acetonitrile:ultra pure water and continue to elute at the same rate, again discarding the column eluate. Do not allow the cartridges to become dry.
- b) Place suitable collection tubes (*e.g.* 10 mL glass test tubes) under each port, as required, in the manifold rack. Load 2.0 mL aliquots of the samples from Section



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3.4 (d) onto the SPE cartridges and allow to percolate through under gravity or under low vacuum, at a rate of approximately 1 - 2 mL/min, to the level of the top frit. Do not allow cartridges to become dry. Collect the eluate, as NOA449280, SYN503780, CSCD656832, CSCD642512, CSCC163768 and CSAA806573 are not retained. Potential interfering sample co-extractives are retained on the cartridge.

c) Add 0.5 mL of methanol to collect any analyte remaining on the SPE cartridge, and continue to collect the eluate. Remove the excess solvent from the cartridges by application of positive pressure or vacuum, collecting the column eluate.

d) Evaporate the samples to less than 1.0 mL under a stream of clean, dry air in a sample concentrator with the temperature set to 40 °C. This should take approximately 20-30 minutes. Although there is no information to suggest that losses occur if samples are left at dryness for extended periods it is recommended that samples are removed immediately after the solvent has evaporated.

e) Adjust final volume to 1.0 mL with methanol and mix well by ultrasonication briefly.

f) Transfer the sample to a suitable autosampler vial ready for final determination by LC-MS/MS. The final sample concentration is 0.4 g/mL.

#### **Alternative Solid Phase Extraction (SPE) Procedure**

Some soil types have exhibited problems from interfering co-extractives, making accurate quantification difficult at the LOQ for CSCD656832 in particular. An SPE procedure using Strata-X SPE cartridges has been included as an alternative. This procedure has been successfully validated (Reference 3).

Note: This procedure has been developed using Phenomenex Strata-X SPE cartridges. Other manufacturers' cartridges may be used (*e.g.*, Waters Oasis HLB), provided they can be shown to be equivalent.

a) Transfer aliquots from Section 3.4 (d) (2 mL, equivalent to 0.4 g) into graduated plastic centrifuge tubes (15 mL size) and place under a stream of air in a sample concentrator set at 40°C. Evaporate the samples to 1 mL ± 0.1 mL then adjust the final volume to 4 mL with ultra pure water. Ultrasonicate the samples briefly to mix the sample thoroughly.

b) Add concentrated formic acid (200 µL) to each sample. Cap the tubes and shake gently to ensure thorough mixing. Check that the pH is < pH 2 using suitable indicator paper. It is important to ensure that the sample is sufficiently acidic so that the carboxylic acids are fully protonated. In the ionised form at higher pH, the metabolites will not be retained on the SPE cartridge, resulting in low

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recovery.

c) Take one Phenomenex Strata-X SPE cartridge (60 mg, 3 mL) for each sample to be analysed and place on a suitable vacuum manifold (e.g. IST Vacmaster). Add methanol (2 mL) and allow to percolate through each cartridge under gravity or draw through under vacuum to the level of the top frit at a rate of approximately 1 mL/min, discarding the column eluate. Do not allow the cartridges to become dry. Add ultra pure water (2 mL) to the top of each cartridge and allow to percolate through under gravity or draw through under vacuum to the level of the top frit at the same rate, again discarding the column eluate. Do not allow the cartridges to become dry.

d) Load the samples from Section 3.6 (b) onto the SPE cartridges and allow to percolate through under gravity or under low vacuum, at a rate of approximately 1 - 2 mL/min, to the level of the top frit. Do not allow cartridges to become dry. NOA449280, SYN503780, CSCD656832, CSCD642512, CSCC163768 and CSAA806573 are retained on the SPE cartridges.

e) On completion of loading, wash the empty sample tubes with ultra pure water containing 2% v/v formic acid (2 mL) and add the rinse to the column reservoir. Allow to percolate through under gravity or draw through under vacuum to the level of the top frit at the same rate, again discarding the column eluate. Do not allow the cartridges to become dry.

f) Wash SPE cartridges with a further portion of 2% v/v formic acid in ultra pure water (2 mL). Allow to percolate through under gravity or draw through under vacuum to the level of the top frit at the same rate, again discarding the column eluate.

g) Briefly apply a high vacuum for approximately 5 - 10 seconds to remove excess 2% formic acid in ultra pure water from the cartridges but do not dry for extended periods. Extended periods of drying the cartridge may result in low recovery of NOA449280 especially.

h) Place suitable collection tubes (e.g. 10 mL glass test tubes) under each port, as required, in the manifold rack. Add 95:5 v/v methanol/formic acid (2 mL) onto the cartridges and allow the mixture to solvate the cartridges for 5 minutes with the tap closed. Elute under gravity or draw through under low vacuum at a rate of approximately 1 - 2 mL/min to the level of the top frit collecting the column eluate.

i) Elute with a further portion of 95:5 v/v methanol/formic acid (3 mL) under gravity or draw through under low vacuum at a rate of approximately 1 - 2 mL/min to the level of the top frit collecting the column eluate. Apply a high vacuum for approximately 5 - 10 seconds to collect the excess solvent from the SPE



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cartridges. NOA449280, SYN503780, CSCD656832, CSCD642512, CSCC163768 and CSAA806573 are eluted in this step.

j) Evaporate the samples to dryness under a stream of clean, dry air in a sample concentrator with the temperature set to 40 °C. This should take approximately 20 - 30 minutes. Although there is no information to suggest that losses occur if samples are left at dryness for extended periods it is recommended that samples are removed immediately the solvent has evaporated.

k) Add acetonitrile (100 µL) to the dried residue and ultrasonicate carefully. Add ultra pure water (0.9 mL) and again ultrasonicate thoroughly to ensure the sample is completely dissolved and thoroughly mixed.

l) Transfer the sample to a suitable autosampler vial ready for final determination by LC-MS/MS. The final sample concentration is 0.4 g/mL.

**II. RECOVERY FINDINGS:**

**Table 2. Initial Validation Method Recoveries for Analytes in Sandy Loam soil <sup>a</sup>**

Analyte	Fortification Level (mg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
NOA449280 Primary transition	0.001	5	72-84	78	n/a	7
	0.01	5	92-101	98	n/a	3
SYN503780 Primary transition	0.001	5	86-98	90	n/a	5
	0.01	5	90-99	90	n/a	3
CSCC163768 Primary transition	0.001	5	67-103	85	n/a	18
	0.01	5	74-99	91	n/a	11
NCSCD656832 Primary transition	0.001	5	80-101	93	n/a	9
	0.01	5	80-101	85	n/a	15
CSCD642512 Primary transition	0.001	5	72-99	85	n/a	15
	0.01	5	78-109	96	n/a	12
CSAA806573 Primary transition	0.001	5	80-95	89	n/a	7
	0.01	5	95-105	100	n/a	4
NOA449280 Confirmatory transition	0.001	5	78-87	83	n/a	4
	0.01	5	91-102	96	n/a	4
SYN503780 Confirmatory transition	0.001	5	101-112	106	n/a	5
	0.01	5	87-97	91	n/a	4
CSCC163768 Confirmatory transition	0.001	5	69-93	79	n/a	13
	0.01	5	73-100	92	n/a	12
CSCD656832 Confirmatory transition	0.001	5	78-100	87	n/a	12
	0.01	5	78-99	92	n/a	9
CSCD642512	0.001	5	76-101	85	n/a	13

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Confirmatory transition	0.01	5	76-98	91	n/a	10
CSCD806573 Confirmatory transition	0.001	5	77-100	88	n/a	10
	0.01	5	100-109	103	n/a	4

<sup>a</sup> Table derived from data from MRID 47841953 NOA449280-Validation of Analytical Method GRM030,04A for the Determination of Residues of NOAA449280 and Metabolites SYN503780, CSCD656832, CSCD64512, CSCC163768 and CSAA806573 in Soil...Method Validation

**Table 3. Initial Validation Method Recoveries for Analytes in Loamy Silt soil<sup>a</sup>**

Analyte	Fortification Level (mg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
NOA449280 Primary transition	0.001	5	93-109	102	n/a	6
	0.01	5	94-105	100	n/a	5
SYN503780 Primary transition	0.001	5	101-112	106	n/a	5
	0.01	5	87-97	91	n/a	4
CSCC163768 Primary transition	0.001	5	68-91	78	n/a	14
	0.01	5	67-95	87		13
NCSCD656832 Primary transition	0.001	5	80-93	86	n/a	6
	0.01	5	69-94	87	n/a	12
CSCD642512 Primary transition	0.001	5	67-97	87	n/a	14
	0.01	5	69-93	87	n/a	12
CSAA806573 Primary transition	0.001	5	86-94	90	n/a	3
	0.01	5	90-96	94	n/a	3
NOA449280 Confirmatory transition	0.001	5	86-101	94	n/a	7
	0.01	5	101-112	106	n/a	4
SYN503780 Confirmatory transition	0.001	5	93-111	101	n/a	7
	0.01	5	89-96	92	n/a	3
CSCC163768 Confirmatory transition	0.001	5	80-99	89	n/a	9
	0.01	5	67-92	86	n/a	13
CSCD656832 Confirmatory transition	0.001	5	77-85	81	n/a	4
	0.01	5	71-95	88	n/a	11
CSCD642512 Confirmatory transition	0.001	5	67-97	87	n/a	14
	0.01	5	69-93	87	n/a	12
CSAA806573 Confirmatory transition	0.001	5	86-101	95	n/a	7
	0.01	5	91-98	95	n/a	3

<sup>a</sup> Table derived from data from MRID 47841953 NOA449280-Validation of Analytical Method GRM030,04A for the Determination of Residues of NOAA449280 and Metabolites SYN503780, CSCD656832, CSCD64512, CSCC163768 and CSAA806573 in Soil (Method Validation)



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**Table 4. Method Recoveries Laboratory Validation for Analytes in Iowa soil<sup>a</sup>**

Analyte	Fortification Level (mg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
NOA449280 Primary transition	0.001	5	88-100	93	n/a	8.5
	0.01	5	88-95	98	n/a	6.7
SYN503780 Primary transition	0.001	5	95-103	95	n/a	6.7
	0.01	5	98-100	98	n/a	2.0
CSCC163768 Primary transition	0.001	5	104-109	105	n/a	3.2
	0.01	5	104-106	105	n/a	0.8
NCSCD656832 Primary transition	0.001	5	99-108	103	n/a	3.2
	0.01	5	98-101	100	n/a	2.6
CSCD642512 Primary transition	0.001	5	101-109	105	n/a	3.6
	0.01	5	96-101	99	n/a	2.0
CSAA806573 Primary transition	0.001	5	88-101	95	n/a	5.1
	0.01	5	95-99	97	n/a	1.5
NOA449280 Confirmatory transition	0.001	5	95-103	98	n/a	3.2
	0.01	5	92-97	94	n/a	2.0
SYN503780 Confirmatory transition	0.001	5	87-105	96	n/a	7.0
	0.01	5	97-99	98	n/a	1.0
CSCC163768 Confirmatory transition	0.001	5	102-110	107	n/a	3.4
	0.01	5	98-105	102	n/a	7.3
CSCD656832 Confirmatory transition	0.001	5	99-108	105	n/a	4.1
	0.01	5	94-101	98	n/a	2.8
CSCD642512 Confirmatory transition	0.001	5	101-109	103	n/a	3.3
	0.01	5	95-105	101	n/a	4.0
CSCD806573 Confirmatory transition	0.001	5	96-100	98	n/a	2.0
	0.01	5	97-104	100	n/a	3.0

<sup>a</sup> Table derived from data presented in MRID 47841952 and MRID 47841950.

**Table 5. Method Recoveries Laboratory Validation for Analytes in Nebraska soil<sup>a</sup>**

Analyte	Fortification Level (mg/kg)	Number of Tests	Recovery Range (%)	Mean Recovery (%)	Standard Deviation (%)	Relative Standard Deviation (%)
NOA449280 Primary transition	0.001	5	81-99	88	n/a	9.2
	0.01	5	92-95	94	n/a	1.5
SYN503780 Primary transition	0.001	5	87-103	98	n/a	6.8
	0.01	5	96-100	99	n/a	1.5
CSCC163768 Primary transition	0.001	5	81-110	107	n/a	3.4
	0.01	5	101-104	102		1.1



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NCSCD656832 Primary transition	0.001	5	89-105	94	n/a	6.8
	0.01	5	98-101	99	n/a	1.3
CSCD642512 Primary transition	0.001	5	75-100	90	n/a	10.7
	0.01	5	98-105	101	n/a	2.7
CSAA806573 Primary transition	0.001	5	86-102	96	n/a	2.0
	0.01	5	96-101	99	n/a	2.5
NOA449280 Confirmatory transition	0.001	5	80-95	91	n/a	6.8
	0.01	5	91-95	94	n/a	1.6
SYN503780 Confirmatory transition	0.001	5	87-109	101	n/a	8.7
	0.01	5	98-101	100	n/a	1.3
CSCC163768 Confirmatory transition	0.001	5	102-110	107	n/a	3.4
	0.01	5	98-105	102	n/a	2.7
CSCD656832 Confirmatory transition	0.001	5	99-106	99	n/a	5.4
	0.01	5	99-102	101	n/a	1.2
CSCD642512 Confirmatory transition	0.001	5	89-105	97	n/a	6.1
	0.01	5	97-107	103	n/a	3.6
CSAA806573 Confirmatory transition	0.001	5	86-107	96	n/a	9.2
	0.01	5	98-104	101	n/a	2.3

<sup>a</sup> Table derived from data presented in MRID 47841952 and MRID 47841950.

### III. METHOD CHARACTERISTICS

**Table 6. Method Characteristics**

	NOA449280	SYN503780	CSCC163768	CSCD656832	CSCD642512	CSAA806573
Limit of Quantitation (LOQ) <sup>a</sup>	0.001 mg kg <sup>-1</sup>	0.001 mg kg <sup>-1</sup>	0.001 mg kg <sup>-1</sup>	0.001 mg kg <sup>-1</sup>	0.001 mg kg <sup>-1</sup>	0.001 mg kg <sup>-1</sup>
Limit of Detection (LOD) primary ion <sup>b</sup>	0.5 µg kg <sup>-1</sup>	0.5µg kg <sup>-1</sup>	0. 5µg kg <sup>-1</sup>	0.5 µg kg <sup>-1</sup>	0.5 µg kg <sup>-1</sup>	0.5µg kg <sup>-1</sup>
Limit of Detection (LOD) confirmatory ion	0.5 µg kg <sup>-1</sup>	0.5 µg kg <sup>-1</sup>	0.5 µg kg <sup>-1</sup>	0.5 µg kg <sup>-1</sup>	0.5 µg kg <sup>-1</sup>	0.5 µg kg <sup>-1</sup>
Linearity (calibration curve r <sup>2</sup> and concentration range)	r <sup>2</sup> = 0.99 0.2ng/ mL– 10ng/mL	r <sup>2</sup> = 0.99 0.2ng/ mL– 10ngm/mL/	r <sup>2</sup> = 0.99 0.2/ mL– 10ng/mL	r <sup>2</sup> = 0.99 0.2ng/ mL– #10ng/mL	r <sup>2</sup> = 0.99 0.2ng/ mL– #100ng/mL	r <sup>2</sup> = 0.99 0.2ng/ mL– #10ngm/mL
Repeatable	Yes	[Yes]	Yes	Yes	Yes	Yes
Reproducible	Yes	Yes	Yes	Yes	Yes	Yes
Specific	Yes	Yes	Yes	Yes	Yes	Yes

<sup>a</sup> The limit of quantitation of the method is defined as the lowest analyte concentration in a sample at which the methodology has been validated and a mean recovery of 70-120% with a relative standard deviation of ≤ 20% has been obtained.

<sup>b</sup>The limit of detection for this method is defined as the lowest analyte concentration detectable above the mean amplitude of the background noise in an untreated sample at the corresponding retention time. An estimate of the LOD can be taken as 3x background noise.

**IV. METHOD DEFICIENCIES AND REVIEWER'S COMMENTS:**

The study submitted as an ILV (MRID47841952) is, in fact, a repackaging of the data from the MRID 47841950. As such, it is not considered to be an independent validation of the methodology. Data provided in MRID 47841953 were for two different soils than data reported in the other two MRIDs.

These studies are not clearly titled with respect to their content. It appears the original method development study is titled as a validation study (MRID 47841953). Additionally another study is titled as a validation study (MRID 47841952) but is a repackaging of data from a study titled as a residue analytical method study (MRID 47841950). This makes review and validation of the information presented both confusing and difficult. Studies should be clearly titled so that the reviewer can tell which is the initial analytical method study and which are the two independent method validations associated with that initial method study.

The independent laboratory validation study indicates that an alternative solid extraction procedure may be necessary for some degradates due to interference from co-extractants (MRID 47841950).

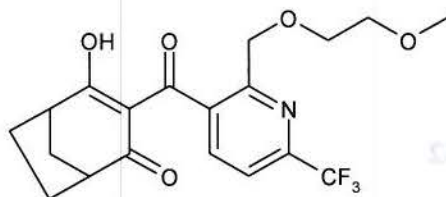


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**Attachment 1: Chemical Names and Structures:**

**Figure 1                      NOA449280**

Compound Code Number : **NOA449280**  
CAS Number : **352010-68-5**  
IUPAC Name : **4-hydroxy-3-[2-(2-methoxy-ethoxymethyl)-6-(trifluoro-methyl)-pyridine-3-carbonyl]-bicyclo[3.2.1]oct-3-en-2-one**  
Molecular Formula : **C<sub>19</sub>H<sub>20</sub>F<sub>3</sub>NO<sub>5</sub>**  
Molecular Weight : **399.4**



**Figure 2                      SYN503780**

Compound Code Number : **SYN503780**  
CAS Number : **380355-55-5**  
IUPAC Name : **2-(2-methoxy-ethoxymethyl)-6-trifluoromethyl-nicotinic acid**  
Molecular Formula : **C<sub>11</sub>H<sub>12</sub>F<sub>3</sub>NO<sub>4</sub>**  
Molecular Weight : **279.2**



**Figure 3                      CSCC163768**

**Bicyclopyrone; PC Code 018986;  
NOA449280; and SYN503780, CSCD656832, CSCD642512, CSCC163768, and CSAA806573  
ENVIRONMENTAL CHEMISTRY METHOD REVIEW REPORT**

Compound Code Number : **CSCC163768**  
CAS Number : **Not in registry**  
IUPAC Name : **6-(trifluoromethyl)pyridine-2,3-dicarboxylic acid**  
Molecular Formula : **C<sub>8</sub>H<sub>4</sub>F<sub>3</sub>NO<sub>4</sub>**  
Molecular Weight : **235.1**



**Figure 4**                      **CSCD656832**

Compound Code Number : **CSCD656832**  
CAS Number : **Not in registry**  
IUPAC Name : **6-(trifluoromethyl)pyridin-3-ol-2-carboxylic acid**  
Molecular Formula : **C<sub>7</sub>H<sub>4</sub>F<sub>3</sub>NO<sub>3</sub>**  
Molecular Weight : **207.1**



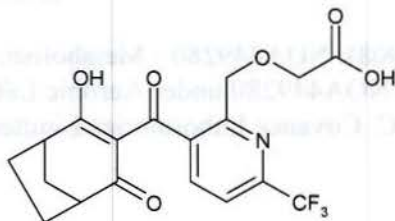
**Figure 5**                      **CSCD642512**

Compound Code Number : **CSCD642512**  
CAS Number : **Not in registry**  
IUPAC Name : **Not known**



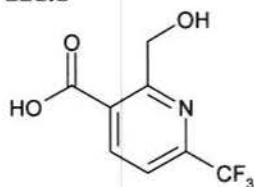
**Bicycloprone; PC Code 018986;  
NOA449280; and SYN503780, CSCD656832, CSCD642512, CSCC163768, and CSAA806573  
ENVIRONMENTAL CHEMISTRY METHOD REVIEW REPORT**

Molecular Formula :  $C_{18}H_{16}F_3NO_6$   
Molecular Weight : 399.3



**Figure 6 CSAA806573**

Compound Code Number : **CSAA806573**  
CAS Number : **Not in registry**  
IUPAC Name : **Not known**  
Molecular Formula :  $C_8H_6F_3NO_3$   
Molecular Weight : 221.1



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**Bicyclopyrone; PC Code 018986;  
NOA449280; and SYN503780, CSCD656832, CSCD642512, CSCC163768, and CSAA806573  
ENVIRONMENTAL CHEMISTRY METHOD REVIEW REPORT**

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