

Repeatability and Reproducibility of the Oasis™ GCB/WAX for PFAS Analysis Cartridges in Soil/Solid Samples for EPA Method 1633

Margot Lee, Chelsea Plummer

Waters Corporation

Abstract

In January 2024, EPA Method 1633 was finalized. EPA Method 1633 is the first method to incorporate the determination of 40 PFAS compounds across many challenging environmental sample matrices outside of drinking water including non-potable waters (ground water, surface water, and wastewater) as well as soil, biosolids, and tissue by LC-MS/MS analysis. EPA Method 1633 requires use of both weak anion exchange (WAX) solid phase extraction with graphitized carbon black (GCB) cleanup and is a performance-based method allowing for modifications as long as acceptance criteria for recoveries and %RSDs are met.

This application note highlights the extraction of soil samples in EPA Method 1633 using the Oasis GCB/WAX for PFAS Analysis, a dual-phase solid-phase extraction cartridge. The results meet the method's acceptance criteria and demonstrate the reproducibility of the cartridges.

Benefits

- Oasis GCB/WAX for PFAS Analysis, a dual-phase cartridge is reproducible and repeatable for EPA Method

1633 soil samples in inter-batch assays

- Reduction of manual steps, overall sample preparation time by use of the dual-phase SPE cartridge
- Acceptance criteria for recoveries and %RSDs are met for EPA Method 1633 for soil samples

Introduction

With EPA Method 1633 finalized, this introduces the first comprehensive US EPA method focused outside of drinking water for PFAS determination.¹ As the method incorporates a wide variety of matrices including ground water, surface water, wastewater, soil, biosolids, and tissue, their sample preparation to ensure reproducibility, sensitivity, and robustness is critical. In EPA Method 1633, the sample preparation incorporates two sorbents, GCB and WAX.

For soil sample analysis, the GCB is packed on top of the WAX sorbent to replicate the EPA Method 1633 where the GCB is used to clean the sample prior to WAX SPE. However, the method is performance-based and gives requirements for establishing equivalency.¹ Oasis GCB/WAX for PFAS Analysis cartridges can alternatively be used and have been tested and shown to meet the acceptance criteria for multiple non-potable water sources as described previously.² Oasis GCB/WAX is a dual-phase, or bilayer cartridge which combines both sorbents into a single device benefitting the user by removing total manual steps in the sample preparation workflow and reducing time by up to 20% compared to use of loose GCB and a WAX cartridge. Additionally, Oasis GCB/WAX for PFAS Analysis undergoes a QC-batch release test for common PFAS to ensure cleanliness during the SPE process reducing the risk of false positives.

This application note uses Oasis GCB/WAX for PFAS Analysis on soil samples showing that the acceptance criteria for EPA Method 1633 is met across three separate product lots of GCB/WAX with six replicates within each lot. This demonstrates not only robustness of the SPE product in EPA 1633 workflows, but and the repeatability and reproducibility inter-batch of GCB/WAX cartridges ensures confidence in out-of-the-box performance of the cartridges for use with complex matrices, like those in EPA Method 1633.



Figure 1. Oasis GCB/WAX dual phase cartridge

for PFAS Analysis.

Experimental

LC-MS Analysis

| | |
|---------------------|--|
| UPLC: | ACQUITY™ UPLC™ I-Class Plus FTN, 50 µL Extension Loop |
| MPA: | 2 mM ammonium acetate in water |
| MPB: | 2 mM ammonium acetate in acetonitrile |
| Columns: | Analytical column: ACQUITY Premier BEH™ C ₁₈ 2.1 x 50 mm, 1.7 µm p/n: 186009452 Isolator column: Atlantis™ Premier BEH C18 AX 2.1 x 50 mm, 5.0 µm p/n: 186009407 |
| Column temperature: | 35 °C |
| Sample temperature: | 8 °C |
| Injection volume: | 2 µL |
| Wash solvent: | 50:50 MeOH: H ₂ O |

| | |
|--------------------------|--|
| Purge solvent: | 10:90 MeOH: H ₂ O |
| MS: | Xevo TQ-XS 01 |
| Capillary voltage: | 0.5 kV |
| Desolvation temperature: | 350 °C |
| Desolvation flow: | 900 L/hr |
| Vials: | 700 µL Polypropylene Screw Cap Vials p/n: 186005219 |

UPLC Gradient Table

| Time (min) | Flow (mL/min) | % MPA | % MPB | Curve |
|------------|---------------|-------|-------|---------|
| 0 | 0.3 | 95 | 5 | initial |
| 0.5 | 0.3 | 75 | 25 | 6 |
| 3 | 0.3 | 50 | 50 | 6 |
| 6.5 | 0.3 | 15 | 85 | 6 |
| 7 | 0.3 | 5 | 95 | 6 |
| 8.5 | 0.3 | 5 | 95 | 6 |
| 9 | 0.3 | 95 | 5 | 6 |
| 11 | 0.3 | 95 | 5 | 6 |

Results and Discussion

High repeatability inter-batch from soil samples using dual-phase Oasis GCB/WAX for PFAS Analysis cartridges.

Recoveries and RSD% meet acceptance criteria of EPA Method 1633.

| Name | %Rec replicate 1 | %Rec replicate 2 | %Rec replicate 3 | %Rec replicate 4 | %Rec replicate 5 | %Rec replicate 6 | Mean recovery | 1633 Recovery acceptance criteria |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------|---|
| PFBA | 110.3 | 106.3 | 131.3 | 107.5 | 106.4 | 103.3 | 111 | 70-140 |
| PFPeA | 102.6 | 106.9 | 127.1 | 107.8 | 99.1 | 104.9 | 108 | 70-140 |
| PFHxA | 106.3 | 102 | 133 | 100.2 | 106.1 | 95.4 | 107 | 70-135 |
| PFHpA | 99.1 | 103.6 | 120.5 | 103.2 | 96.1 | 95.7 | 104 | 70-140 |
| PFOA | 106.1 | 106.2 | 133.2 | 104.9 | 98.2 | 102.3 | 113 | 70-140 |
| PFNA | 104.4 | 113 | 137 | 118.8 | 116.5 | 102.2 | 115 | 65-145 |
| PFUnDA | 93.8 | 124.9 | 145.6 | 102.4 | 131.8 | 131.6 | 123 | 70-145 |
| PFDoDA | 106.9 | 97.4 | 129.9 | 101.9 | 103.7 | 111 | 108 | 70-145 |
| PFDA | 119.8 | 113.4 | 121.1 | 101.6 | 119.5 | 109.9 | 114 | 70-145 |
| PFTriDA | 100.6 | 87.7 | 114.4 | 101.3 | 100.6 | 105.1 | 102 | 55-160 |
| PFTreDA | 107.6 | 91.5 | 162.9 | 106.8 | 102.2 | 98.1 | 112 | 70-145 |
| PFBS | 104.9 | 99.6 | 116.8 | 97.3 | 88.2 | 84.1 | 98 | 60-145 |
| PFPeS | 102.9 | 112.6 | 124.6 | 100.4 | 95.5 | 98.2 | 99 | 65-140 |
| PFHxS | 97.9 | 109.3 | 117.1 | 94.5 | 101.3 | 87.7 | 101 | 65-145 |
| PFHpS | 116.6 | 112.4 | 118.4 | 90.8 | 88.8 | 95.6 | 104 | 70-140 |
| PFOS | 106.9 | 110.4 | 135.8 | 93.5 | 109.9 | 97.6 | 109 | 70-135 |
| PFNS | 107.5 | 117.8 | 111.7 | 88.9 | 92.2 | 93 | 102 | 70-140 |
| PFDS | 119.3 | 114.3 | 120.3 | 88.6 | 107.7 | 97.1 | 108 | 50-150 |
| PFDoDS | 93.7 | 87.4 | 95.8 | 81 | 114.3 | 88.5 | 89 | 40-140 |
| GenX | 111.4 | 103.6 | 144.7 | 118.6 | 103.2 | 111.5 | 116 | 70-140 |
| ADONA | 115.7 | 103.5 | 133.9 | 116.1 | 112 | 108.1 | 115 | 70-155 |
| 9CIPF3ONS | 105.3 | 104.8 | 138.5 | 115.7 | 112.8 | 99.2 | 113 | 65-135 |
| 11CIPF3OUdS | 106.7 | 97.7 | 123.3 | 103.7 | 119.5 | 100.4 | 109 | 50-135 |
| 4_2 FTS | 105.6 | 95.8 | 107.4 | 94 | 117.5 | 94.8 | 103 | 70-135 |
| 6_2 FTS | 132.1 | 138.2 | 163.9 | 133.8 | 122.9 | 129.7 | 137 | 60-160 |
| 8_2 FTS | 113.1 | 92.5 | 110.5 | 85.3 | 100.8 | 109.8 | 102 | 70-140 |
| FOSA | 113 | 103.6 | 129.2 | 109.1 | 104.1 | 104.6 | 105 | 70-140 |
| NMeFOSA | 138.5 | 151.6 | 171.1 | 132.4 | 125.9 | 130.4 | 142 | 65-145 |
| NEtFOSA | 138.5 | 138 | 181.8 | 125.2 | 118.7 | 139.9 | 132 | 70-135 |
| NMeFOSAA | 104.4 | 104 | 154.6 | 111.5 | 98.4 | 107.7 | 113 | 60-145 |
| NEtFOSAA | 121.9 | 110.8 | 127.1 | 125.9 | 96.6 | 118.8 | 117 | 60-150 |
| NMeFOSE | 110.8 | 110.5 | 144.9 | 109.9 | 105.5 | 115.5 | 116 | 70-140 |
| NEtFOSE | 119.2 | 116 | 159.6 | 118.4 | 109.1 | 121.8 | 124 | 70-135 |
| 3:3 FTCA | 90.1 | 99.7 | 117.6 | 91.5 | 97.3 | 92 | 98 | 45-155 |
| 5:3 FTCA | 106.6 | 99.9 | 126.7 | 100.5 | 103 | 100.5 | 100 | 70-135 |
| 7:3 FTCA | 103.8 | 90.1 | 117.5 | 96.5 | 102.7 | 93.8 | 90 | 70-145 |
| PFMPA | 106.6 | 105.6 | 123.8 | 101 | 92.1 | 99.1 | 107 | 70-140 |
| PFMBA | 106.8 | 101.4 | 129.8 | 104.4 | 97.7 | 99.2 | 107 | 55-145 |
| Cholic acid | 96.9 | 116.8 | 121.7 | 114.9 | 109.3 | 87.7 | 108 | Not listed |
| PFEESA | 100.3 | 98.8 | 127.9 | 101.5 | 91.9 | 97.4 | 103 | 70-140 |
| NFDHA | 103 | 102.5 | 129.8 | 100.6 | 97 | 87.2 | 103 | 45-145 |
| M4 PFBA | 83.1 | 111.1 | 85.7 | 119.4 | 91.2 | 106.9 | 100 | 8-130 |
| M5_PFPeA | 83 | 112.7 | 85.3 | 117.1 | 96.6 | 108.4 | 101 | 35-130 |
| M5_PFHxA | 85.2 | 118.5 | 83.7 | 117.4 | 103.6 | 108.8 | 103 | 40-130 |
| M4_PFHpA | 90.7 | 114.5 | 87.5 | 119 | 113.3 | 104.6 | 107 | 40-130 |
| M8_PFOA | 94.7 | 121.9 | 86.1 | 125 | 113.3 | 101.6 | 107 | 40-130 |
| M9_PFNA | 82.2 | 109.8 | 84.1 | 117.9 | 108.3 | 94.1 | 99 | 40-130 |
| M6_PFDA | 86.2 | 115.2 | 90.9 | 125.8 | 105.6 | 95 | 103 | 40-130 |
| M7_PFUnDA | 80.5 | 104.4 | 79 | 121.9 | 101.6 | 88.5 | 96 | 40-130 |
| M_PFDODA | 85.4 | 109 | 81.1 | 113.1 | 112.1 | 91.6 | 99 | 40-130 |
| M2_PFTreDA | 71.8 | 85.8 | 60.9 | 94.9 | 105.6 | 85.6 | 84 | 20-130 |
| M3_PFBS | 73.4 | 110.7 | 81.5 | 117.4 | 90.3 | 105 | 99 | 40-135 |
| M3_PFHxS | 81.6 | 117.4 | 89.3 | 126.2 | 102 | 105.7 | 104 | 40-130 |
| M8_PFOS | 83.9 | 90.7 | 85 | 137.2 | 100.7 | 115.6 | 102 | 40-130 |
| M2_42FTS | 84.6 | 122 | 106.7 | 143.1 | 97.7 | 114.5 | 111 | 40-165 |
| M2_62FTS | 91.2 | 115.5 | 91.3 | 127.5 | 118.1 | 110.8 | 109 | 40-215 |
| M2_82FTS | 77.3 | 119.6 | 89.2 | 154.2 | 108.1 | 93.1 | 107 | 40-275 |
| M8_FOSA | 80 | 92 | 76.5 | 112 | 102.7 | 106.2 | 95 | 40-130 |
| M3_GenX | 81.8 | 112.5 | 78.1 | 104.6 | 96.2 | 95.9 | 95 | 40-130 |
| D3_NMeFOSAA | 73.2 | 82.7 | 62.9 | 99.2 | 95.8 | 95.3 | 85 | 40-135 |
| D5_NEtFOSAA | 67.9 | 80.6 | 67.1 | 85.2 | 90.9 | 95.2 | 81 | 40-150 |
| dNMeFOSA | 44.9 | 42.2 | 28.9 | 56.5 | 56.4 | 53.8 | 47 | 10-130 |
| dNEtFOSA | 40 | 42.6 | 27.6 | 60.7 | 55.4 | 50.1 | 46 | 10-130 |
| d7 NMeFOSE | 73.5 | 74 | 51.1 | 94 | 93.2 | 91.2 | 80 | 20-130 |
| d9 NEtFOSE | 68 | 69.7 | 46.3 | 86 | 86 | 84.3 | 73 | 15-130 |
| M3 PFBA_NIS | 77.8 | 76 | 68.6 | 71.8 | 65.1 | 73.1 | 72 | 50-200 |
| M2 PFHxA_NIS | 76.1 | 72 | 68.9 | 73.3 | 65.3 | 73.5 | 72 | 50-200 |
| M4 PFOA_NIS | 73.4 | 71 | 69.5 | 71.4 | 66.5 | 76.6 | 71 | 50-200 |
| M5 PFNA_NIS | 76.9 | 77 | 68.3 | 73.6 | 69.4 | 77.2 | 74 | 50-200 |
| M2 PFDA_NIS | 76 | 72.5 | 66.2 | 68.5 | 67.9 | 75.4 | 71 | 50-200 |
| 18O2 PFHxS_NIS | 79.7 | 72.5 | 68.7 | 72.2 | 68 | 72.9 | 72 | 50-200 |
| M4 PFOS_NIS | 73.8 | 82.9 | 70.5 | 68.8 | 68 | 64.9 | 71 | 50-200 |

Figure 2. Demonstration of Oasis GCB/WAX for PFAS Analysis performance repeatability requiring no protocol optimization, with recovery

within 1633 acceptance criteria. Green displays values within 1633 acceptance criteria.

**Not listed: EPA 1633 does not provide acceptance criteria for this compound. Note: 2/6 replicates excluded for NEtFOSA (2/3 sample set excluded 140% mean recovery meets specification(70-130%).*

| Name | %Rec replicate 1 | %Rec replicate 2 | %Rec replicate 3 | %Rec replicate 4 | %Rec replicate 5 | %Rec replicate 6 | Mean N=6 %RSD total | 1633 % RSD acceptance criteria (≤) |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------------------|--|
| PFBA | 110.3 | 106.3 | 131.3 | 107.5 | 106.4 | 103.3 | 9 | 17 |
| PFPeA | 102.6 | 106.9 | 127.1 | 107.8 | 99.1 | 104.9 | 9 | 26 |
| PFHxA | 106.3 | 102 | 133 | 100.2 | 106.1 | 95.4 | 12 | 23 |
| PFHpA | 99.1 | 103.6 | 120.5 | 103.2 | 96.1 | 95.7 | 9 | 21 |
| PFOA | 106.1 | 106.2 | 133.2 | 104.9 | 98.2 | 102.3 | 12 | 23 |
| PFNA | 104.4 | 113 | 137 | 118.8 | 116.5 | 102.2 | 11 | 24 |
| PFUnDA | 93.8 | 124.9 | 145.6 | 102.4 | 131.8 | 131.6 | 16 | 26 |
| PFDoDA | 106.9 | 97.4 | 129.9 | 101.9 | 103.7 | 111 | 11 | 26 |
| PFDA | 119.8 | 113.4 | 121.1 | 101.6 | 119.5 | 109.9 | 7 | 25 |
| PFTriDA | 100.6 | 87.7 | 114.4 | 101.3 | 100.6 | 105.1 | 8 | 26 |
| PFTreDA | 107.6 | 91.5 | 162.9 | 106.8 | 102.2 | 98.1 | 23 | 24 |
| PFBS | 104.9 | 99.6 | 116.8 | 97.3 | 88.2 | 84.1 | 12 | 25 |
| PFPeS | 102.9 | 112.6 | 124.6 | 100.4 | 95.5 | 98.2 | 10 | 29 |
| PFHxS | 97.9 | 109.3 | 117.1 | 94.5 | 101.3 | 87.7 | 10 | 28 |
| PFHpS | 116.6 | 112.4 | 118.4 | 90.8 | 88.8 | 95.6 | 13 | 27 |
| PFOS | 106.9 | 110.4 | 135.8 | 93.5 | 109.9 | 97.6 | 14 | 27 |
| PFNS | 107.5 | 117.8 | 111.7 | 88.9 | 92.2 | 93 | 12 | 27 |
| PFDS | 119.3 | 114.3 | 120.3 | 88.6 | 107.7 | 97.1 | 12 | 31 |
| PFDoDS | 93.7 | 87.4 | 95.8 | 81 | 114.3 | 88.5 | 12 | 40 |
| GenX | 111.4 | 103.6 | 144.7 | 118.6 | 103.2 | 111.5 | 13 | 27 |
| ADONA | 115.7 | 103.5 | 133.9 | 116.1 | 112 | 108.1 | 9 | 50 |
| 9CIPF3ONS | 105.3 | 104.8 | 138.5 | 115.7 | 112.8 | 99.2 | 12 | 27 |
| 11CIPF3OUdS | 106.7 | 97.7 | 123.3 | 103.7 | 119.5 | 100.4 | 10 | 19 |
| 4_2 FTS | 105.6 | 95.8 | 107.4 | 94 | 117.5 | 94.8 | 9 | 26 |
| 6_2 FTS | 132.1 | 138.2 | 163.9 | 133.8 | 122.9 | 129.7 | 10 | 19 |
| 8_2 FTS | 113.1 | 92.5 | 110.5 | 85.3 | 100.8 | 109.8 | 11 | 26 |
| FOSA | 113 | 103.6 | 129.2 | 109.1 | 104.1 | 104.6 | 9 | 19 |
| NMeFOSA | 138.5 | 151.6 | 171.1 | 132.4 | 125.9 | 130.4 | 12 | 28 |
| NEtFOSA | 138.5 | 138 | 181.8 | 125.2 | 118.7 | 139.9 | 16 | 19 |
| NMeFOSAA | 104.4 | 104 | 154.6 | 111.5 | 98.4 | 107.7 | 18 | 31 |
| NEtFOSAA | 121.9 | 110.8 | 127.1 | 125.9 | 96.6 | 118.8 | 10 | 31 |
| NMeFOSE | 110.8 | 110.5 | 144.9 | 109.9 | 105.5 | 115.5 | 12 | 19 |
| NEtFOSE | 119.2 | 116 | 159.6 | 118.4 | 109.1 | 121.8 | 14 | 17 |
| 3:3 FTCA | 90.1 | 99.7 | 117.6 | 91.5 | 97.3 | 92 | 10 | 32 |
| 5:3 FTCA | 106.6 | 99.9 | 126.7 | 100.5 | 103 | 100.5 | 10 | 28 |
| 7:3 FTCA | 103.8 | 90.1 | 117.5 | 96.5 | 102.7 | 93.8 | 9 | 39 |
| PFMPA | 106.6 | 105.6 | 123.8 | 101 | 92.1 | 99.1 | 10 | 25 |
| PFMBA | 106.8 | 101.4 | 129.8 | 104.4 | 97.7 | 99.2 | 11 | 33 |
| Cholic acid | 96.9 | 116.8 | 121.7 | 114.9 | 109.3 | 87.7 | 12 | Not listed |
| PFEESA | 100.3 | 98.8 | 127.9 | 101.5 | 91.9 | 97.4 | 12 | 20 |
| NFDHA | 103 | 102.5 | 129.8 | 100.6 | 97 | 87.2 | 14 | 27 |
| M4 PFBA | 83.1 | 111.1 | 85.7 | 119.4 | 91.2 | 106.9 | 15 | Not listed |
| M5_PFPeA | 83 | 112.7 | 85.3 | 117.1 | 96.6 | 108.4 | 14 | Not listed |
| M5_PFHxA | 85.2 | 118.5 | 83.7 | 117.4 | 103.6 | 108.8 | 15 | Not listed |
| M4_PFHpA | 90.7 | 114.5 | 87.5 | 119 | 113.3 | 104.6 | 13 | Not listed |
| M8_PFOA | 94.7 | 121.9 | 86.1 | 125 | 113.3 | 101.6 | 14 | Not listed |
| M9_PFNAA | 82.2 | 109.8 | 84.1 | 117.9 | 108.3 | 94.1 | 15 | Not listed |
| M6_PFDA | 86.2 | 115.2 | 90.9 | 125.8 | 105.6 | 95 | 15 | Not listed |
| M7_PFUnDA | 80.5 | 104.4 | 79 | 121.9 | 101.6 | 88.5 | 17 | Not listed |
| M_PFDODA | 85.4 | 109 | 81.1 | 113.1 | 112.1 | 91.6 | 15 | Not listed |
| M2_PFTreDA | 71.8 | 85.8 | 60.9 | 94.9 | 105.6 | 85.6 | 19 | Not listed |
| M3_PFBs | 73.4 | 110.7 | 81.5 | 117.4 | 90.3 | 105 | 18 | Not listed |
| M3_PFHxS | 81.6 | 117.4 | 89.3 | 126.2 | 102 | 105.7 | 16 | Not listed |
| M8_PFOS | 83.9 | 90.7 | 85 | 137.2 | 100.7 | 115.6 | 20 | Not listed |
| M2_42FTS | 84.6 | 122 | 106.7 | 143.1 | 97.7 | 114.5 | 18 | Not listed |
| M2_62FTS | 91.2 | 115.5 | 91.3 | 127.5 | 118.1 | 110.8 | 14 | Not listed |
| M2_82FTS | 77.3 | 119.6 | 89.2 | 154.2 | 108.1 | 93.1 | 26 | Not listed |
| M8_FOSA | 80 | 92 | 76.5 | 112 | 102.7 | 106.2 | 15 | Not listed |
| M3_GenX | 81.8 | 112.5 | 78.1 | 104.6 | 96.2 | 95.9 | 14 | Not listed |
| D3_NMeFOSAA | 73.2 | 82.7 | 62.9 | 99.2 | 95.8 | 95.3 | 17 | Not listed |
| D5_NEtFOSAA | 67.9 | 80.6 | 67.1 | 85.2 | 90.9 | 95.2 | 14 | Not listed |
| dNMeFOSA | 44.9 | 42.2 | 28.9 | 56.5 | 56.4 | 53.8 | 23 | Not listed |
| dNEtFOSA | 40 | 42.6 | 27.6 | 60.7 | 55.4 | 50.1 | 26 | Not listed |
| d7 NMeFOSE | 73.5 | 74 | 51.1 | 94 | 93.2 | 91.2 | 21 | Not listed |
| d9 NEtFOSE | 68 | 69.7 | 46.3 | 86 | 86 | 84.3 | 21 | Not listed |
| M3 PFBA_NIS | 77.8 | 76 | 68.6 | 71.8 | 65.1 | 73.1 | 7 | Not listed |
| M2 PFHxA_NIS | 76.1 | 72 | 68.9 | 73.3 | 65.3 | 73.5 | 5 | Not listed |
| M4 PFOA_NIS | 73.4 | 71 | 69.5 | 71.4 | 66.5 | 76.6 | 5 | Not listed |
| M5 PFNA_NIS | 76.9 | 77 | 68.3 | 73.6 | 69.4 | 77.2 | 5 | Not listed |
| M2 PFDA_NIS | 76 | 72.5 | 66.2 | 68.5 | 67.9 | 75.4 | 6 | Not listed |
| 18O2 PFHxS_NIS | 79.7 | 72.5 | 68.7 | 72.2 | 68 | 72.9 | 6 | Not listed |
| M4 PFOS_NIS | 73.8 | 82.9 | 70.5 | 68.8 | 68 | 64.9 | 9 | Not listed |

Figure 3. Demonstration of Oasis GCB/WAX for PFAS Analysis performance repeatability requiring no protocol optimization, with %RSD

within 1633 acceptance criteria. Green displays values within 1633 acceptance criteria.

**Not listed: EPA 1633 does not provide % RSD criteria for this compound.*

Conclusion

This study demonstrates the reproducibility of the dual-phase Oasis GCB/WAX for PFAS Analysis cartridges for determination of 40 PFAS and standards using the ACQUITY UPLC I-Class System and Xevo TQ-XS mass spectrometer. The cartridges are suitable for PFAS analysis in accordance with EPA 1633 guidelines for recovery and % RSD. The GCB/WAX cartridges show excellent repeatability across multiple replicates across soil samples. The data demonstrates Oasis GCB/WAX for PFAS Analysis cartridges are ideally suited for PFAS analysis from complex matrices, such as soils and solid samples like those described in EPA Method 1633. Out of the box performance is expected lot to lot and within lot for SPE when using Oasis GCB/WAX for PFAS Analysis.

References

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