

Tables

Table 6-1. Analytical parameter and sample summary

| Analytical Parameter | Method Type | Method Number | Number of Samples | | | | |
|----------------------|-----------------------|---------------|-------------------|------------------------------|-----|----|-----|
| | | | Primary | Quality Control ^a | | | |
| | | | | MB | LCS | MS | REP |
| Total organic carbon | carbonaceous analyzer | EPA 9060 | 100 | 5 | 5 | 5 | 5 |
| Dioxin/furans | HRGC/HRMS | EPA 1613B | 100 | 5 | 5 | 0 | 0 |

^a Quality control samples include method blanks (MBs), laboratory control samples (LCSs), matrix spikes (MSs), and laboratory replicates (REPs)
EPA – U.S. Environmental Protection Agency
HRGC – High-resolution gas chromatography
HRMS – High-resolution mass spectrometry

Table 6-2. Sample analytical methods, preservation requirements, and sample containers

| Matrix | Quantity | Analytical Parameters/ Method | Sample Preservation | Holding Time* | Sample Container(s) |
|--------|----------|-----------------------------------|------------------------|---|--|
| Soil | 105 | Dioxin/Furans/EPA Method 1613B | Cool to 4°C ∇ 2°C | Extract within 14 days of collection; analyze within 40 days of extraction | One 8-oz wide-mouth glass jar with Teflon-lined lid |
| | 105 | TOC/SW-846 9060 | Cool to 4°C ∇ 2°C | 14 days from collection | One 8-oz wide-mouth glass jar with Teflon-lined lid |

*Holding times for frozen (to -18°C) archived samples are: 1 year for dioxins/furans; 6 months for TOC.

KEY:

°C = Degrees Celsius.

EPA = EPA, *Method 1613B: Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS*, October 1994.

oz = Ounce.

SW = *Test Methods for Evaluating Solid Waste, Physical Chemical Methods*, 3rd edition, SW-846, 1986.

Table 6-3. Dioxin/furan analytes and method detection limits for EPA Method 1613B

| Dioxins/Furans | Minimum Level Defined by EPA Method 1613B for 20 g dry sample size (ng/kg) | Modified Method Detection Limit prorated for 20 g dry sample size (ng/kg) |
|---------------------|--|---|
| TCDD | 0.1 | 0.025 |
| 2,3,7,8-TCDD | 0.1 | 0.025 |
| PeCDD | 0.5 | 0.065 |
| 1,2,3,7,8-PeCDD | 0.5 | 0.065 |
| HxCDD | 0.5 | 0.095 |
| 1,2,3,4,7,8-HxCDD | 0.5 | 0.095 |
| 1,2,3,6,7,8-HxCDD | 0.5 | 0.09 |
| 1,2,3,7,8,9-HxCDD | 0.5 | 0.085 |
| HpCDD | 0.5 | 0.085 |
| 1,2,3,4,6,7,8-HpCDD | 0.5 | 0.085 |
| OCDD | 1.0 | 0.42 |
| TCDF | 0.1 | 0.025 |
| 2,3,7,8-TCDF | 0.1 | 0.025 |
| PeCDF | 0.5 | 0.048 |
| 1,2,3,7,8-PeCDF | 0.5 | 0.048 |
| 2,3,4,7,8-PeCDF | 0.5 | 0.048 |
| HxCDF | 0.5 | 0.06 |
| 1,2,3,4,7,8-HxCDF | 0.5 | 0.046 |
| 1,2,3,6,7,8-HxCDF | 0.5 | 0.06 |
| 1,2,3,7,8,9-HxCDF | 0.5 | 0.047 |
| 2,3,4,6,7,8-HxCDF | 0.5 | 0.06 |
| HpCDF | 0.5 | 0.05 |
| 1,2,3,4,6,7,8-HpCDF | 0.5 | 0.05 |
| 1,2,3,4,7,8,9-HpCDF | 0.5 | 0.044 |
| OCDF | 1.0 | 0.14 |

g = gram
 kg = kilogram
 ng = nanogram

Table 7-1. Measurement quality objectives

| Analytical Parameter | Reporting Unit | Reporting Limit | Precision | | Accuracy | |
|----------------------|----------------|-----------------|---|--|-------------------------------------|---------------------------------|
| | | | Laboratory Duplicate RPD (percent) ^a | Laboratory Triplicate RSD (percent) ^a | Control Standard Recovery (percent) | Matrix Spike Recovery (percent) |
| Total organic carbon | Percent | 0.1 | 20 | 20 | 75 -125 | 75 -125 |
| PCDD/PCDF | ng/kg | 1 – 10 | NA | NA | See table 7-2 | NA |

^aThe relative percent difference (RPD) and relative standard deviation (RSD) will be less than or equal to the indicated percentage for values that are greater than 5 times the reporting limit, and ± 2 times the reporting limit for values that are less than or equal to 5 times the reporting limit.

ngkg – nanograms per kilogram.

RPD – relative percent difference.

RSD – relative standard deviation.

NA – not applicable.

Table 7-2. Laboratory control sample acceptance criteria for dioxin/furans analysis

| Compound | Laboratory control standard recovery (percent) |
|---------------------|--|
| 2,3,7,8-TCDD | 67-158 |
| 2,3,7,8-TCDF | 75-158 |
| 1,2,3,7,8-PeCDD | 70-142 |
| 1,2,3,7,8-PeCDF | 80-134 |
| 2,3,4,7,8-PeCDF | 68-160 |
| 1,2,3,4,7,8-HxCDD | 70-164 |
| 1,2,3,6,7,8-HxCDD | 76-134 |
| 1,2,3,7,8,9-HxCDD | 64-162 |
| 1,2,3,4,7,8-HxCDF | 72-134 |
| 1,2,3,6,7,8-HxCDF | 84-130 |
| 1,2,3,7,8,9-HxCDF | 78-130 |
| 2,3,4,6,7,8-HxCDF | 70-156 |
| 1,2,3,4,6,7,8-HpCDD | 70-140 |
| 1,2,3,4,6,7,8-HpCDF | 82-132 |
| 1,2,3,4,7,8,9-HpCDF | 78-138 |
| OCDD | 78-144 |
| OCDF | 63-170 |

Table 7-3. Labeled compound recovery acceptance criteria for dioxin/furans analysis

| Compound | Labeled compound recovery (percent) |
|--|-------------------------------------|
| ¹³ C ₁₂ -2,3,7,8-TCDD | 25-164 |
| ¹³ C ₁₂ -2,3,7,8-TCDF | 24-169 |
| ¹³ C ₁₂ -1,2,3,7,8-PeCDD | 25-181 |
| ¹³ C ₁₂ -1,2,3,7,8-PeCDF | 24-185 |
| ¹³ C ₁₂ -2,3,4,7,8-PeCDF | 21-178 |
| ¹³ C ₁₂ -1,2,3,4,7,8-HxCDD | 32-141 |
| ¹³ C ₁₂ -1,2,3,6,7,8-HxCDD | 28-130 |
| ¹³ C ₁₂ -1,2,3,4,7,8-HxCDF | 26-152 |
| ¹³ C ₁₂ -1,2,3,6,7,8-HxCDF | 26-123 |
| ¹³ C ₁₂ -1,2,3,7,8,9-HxCDF | 29-147 |
| ¹³ C ₁₂ -2,3,4,6,7,8-HxCDF | 28-136 |
| ¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDD | 23-140 |
| ¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDF | 28-143 |
| ¹³ C ₁₂ -1,2,3,4,7,8,9-HpCDF | 26-138 |
| ¹³ C ₁₂ -OCDD | 17-157 |
| ³⁷ Cl ₄ -2,3,7,8-TCDD | 35-197 |