3M Company
St. Paul, Minnesota

Fluorochemical (FC) Data Assessment Report

3M Company

Cottage Grove, Minnesota Facility

April 2006

WESTON SOLUTIONS

06P-0186-1

FLUOROCHEMICAL (FC) DATA ASSESSMENT REPORT FOR THE 3M COTTAGE GROVE, MN FACILITY

April 2006

Prepared for

3M Company

by

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ES. EXECUTIVE SUMMARY

The 3M Company (3M) Cottage Grove, Minnesota facility has been in operation since 1947. The facility currently manufactures a range of products, some of which include adhesive products, specialty paper, industrial polymers, abrasives, and reflective road sign materials and also engages in research and development. 3M has worked cooperatively with the Minnesota Pollution Control Agency (MPCA) since the early 1980s in assessing and addressing the facility's past on-site waste disposal issues.

3M has expressed its intention to voluntarily assess the presence of fluorochemicals associated with the manufacturing operations at the Cottage Grove facility. The fluorochemicals (FCs) include the following compounds:

- Perfluorooctanoic acid (PFOA) – An 8-carbon (C8) carboxylate.
- Perfluorooctane sulfonate (PFOS) – An 8-carbon (C8) sulfonate.
- Perfluorohexane sulfonate (PFHS) – A 6-carbon (C6) sulfonate.
- Perfluorobutane sulfonate (PFBS) – A 4-carbon (C4) sulfonate.

In December 2004, 3M submitted to the MPCA the *Facility-wide Fluorochemical (FC) Investigation Work Plan* (FC Work Plan) to assess these FCs at its Cottage Grove, Minnesota plant. The MPCA approved the Work Plan with modifications in January 2005.

FC ASSESSMENT

Activities conducted under the FC Work Plan were initiated with a file review in January 2005. This review was conducted to collect information on the historic 3M Cottage Grove facility waste generation, waste disposal, or treatment both on-site and off-site. The field assessment commenced in March 2005 and was completed in August 2005. It consisted of the following:

- **Groundwater and Additional Assessment** – In March and May 2005, field data and groundwater samples were collected from 21 existing monitoring wells, six production wells, and two water supply wells at the 3M Cottage Grove facility. One monitoring well (MW-6) could not be sampled due to an obstruction in the well borehole. A sample of water from the tap at Bldg. 116 (cafeteria) was collected after granular activated carbon (GAC) treatment unit.

Additionally, the four pumping wells at the former 3M Woodbury disposal site (Woodbury Site) and the combined discharge from these wells, which provide non-contact process water for the 3M Cottage Grove facility, were sampled once per month for three months in March, April, and May 2005. At the same time, the discharge from the 3M Cottage Grove non-contact process water retention pond also was sampled.

- **Soil Assessment** – In May 2005, the soil assessment included 16 soil borings installed to depths ranging from 25 to 70 feet below ground surface (ft bgs) and 112 composite soil samples collected at 5-ft intervals from the soil borings.

  Fifty (50) surface soil samples were collected from two shallow depths at 25 locations in drainageways, areas where FCs were handled, and other general site locations.

- **Sediment and Surface Water** – In August 2005, a sediment and surface water assessment was conducted at the 3M Cottage Grove facility and the Mississippi River. Twenty (20) sediment samples and nine surface water samples were collected from the east and west coves and the Mississippi River. Six sediment samples, colocated with six surface water samples, were collected from the 0-10 cm depth interval at locations upstream, adjacent, and downstream of the facility in the Mississippi River. Sediment samples were collected from three locations in the east and west coves and upstream of each cove. One surface water sample was collected from each cove. Also, one surface water sample was collected upstream of the east cove but the drainageway upstream of the west cove was dry.

- **Fish** - In August 2005, fish sampling was performed at three reaches of the Mississippi River, one upstream, one adjacent to the plant, and one downstream. A total of 62 fish were collected including 11 smallmouth bass, 30 channel catfish and 21 bluegill sunfish. Whole body or filet tissue samples were prepared from the collected specimens for chemical analyses.

- **File Review and Interviews** – A file review and interviews with retired and current employees were conducted to collect information on the historical waste generation, waste disposal, or treatment both on-site and off-site.

All of the samples collected under this FC assessment program were submitted to Exygen Research in State College, Pennsylvania, for analyses of PFOA, PFOS, PFHS, and PFBS.

A subset of the soil samples were also selected for grain size distribution and total organic carbon (TOC) analyses.

RESULTS OF THE FC ASSESSMENT AND DATA NEEDS

The findings from the file review relative to waste disposal locations utilized by the facility were submitted to the MPCA in June 2005. This review indicated that, other than on-site, there were three key off-site areas where wastes were disposed. These included: the former Oakdale disposal site (Oakdale Site), the Woodbury Site, and the Washington County Landfill. The Oakdale Site is being assessed by 3M under a related but separate work plan. The Woodbury Site has been assessed under the FC Work Plan covered by this Data Assessment Report. The MPCA is addressing the Washington County Landfill under its Closed Landfill Program.

It was found that the facility personnel interviews corroborated information from the file review and provided additional details. A new item discussed during the personnel interviews was the possible existence and location of a former on-site sludge disposal pit. No documentation of this pit was evident in the file review and it has not been assessed. This former on-site sludge disposal pit has been designated as D9 for future assessment purposes.

Groundwater -The highest FC concentrations were detected in groundwater samples from monitoring wells MW-12 downgradient of the D5 – Former Solids Burn Pit Area, MW-14 downgradient of the D8 – Former Waste Disposal Area, and MW-101 downgradient of the D1 – Former HF Tar Neutralization Pit. In these areas, PFOA concentrations ranged from 150 to 1,863 ppb and PFOS from 80 to 324 ppb.

The highest FC concentrations detected in groundwater samples collected from pumping wells were detected at pumping well PW-6 (155 ppb PFOA). PW-6 is downgradient of the D8 Area. Groundwater elevation data collected from the monitoring wells in March 2005 show that the influence of the pumping wells is most significant in the central plant area and is reduced with increasing distance from this area.

With respect to groundwater at the 3M Cottage Grove facility, the following data needs (additional information that will be useful for assessment) have been identified:

- The file review and personnel interviews indicated that there may be a former sludge disposal pit, which had not been assessed previously. This is located between the wastewater treatment plant and the D2 Area and will be referred to as the D9 Area. Groundwater quality and movement in the area of the D9 sludge disposal pit has not been characterized.
- The potential movement of groundwater to surface water, particularly downgradient of the D8, D5, and D2 Areas, has not been characterized.

Of the four pumping wells at the Woodbury Site, pumping well R4 contained the highest FC concentrations (19.7-23.3 ppb PFHS, 5.72-11 ppb PFBS, 2.78-3.12 ppb PFOA, and 1.83-2.29 ppb PFOS). At pumping wells R1 and R3, detected concentrations of PFBS and PFHS ranged from 0.337 to 3.47 ppb and 1.03 to 2.61 ppb, respectively. PFOA and PFOS were detected in these wells at concentrations ranging from 0.153 to 2.33 ppb and 0.0562 to 0.144 ppb, respectively. No FCs were detected at pumping well R2. Additionally, FCs were detected in the pumping well combined discharge at comparable concentrations to the discharge from the Cottage Grove non-contact process water retention pond. Thus, the pumping wells at the Woodbury Site have been characterized and no further assessment of the Woodbury Site appears to be warranted at this time.

Soil - The highest concentrations of FCs in soils were found in the D2 and D1 Areas. In the D2 – Former Sludge Disposal Area, the highest FC concentrations (up to 12,350 ppb PFOS[1]) were found in the sludge. Lower concentrations (ranging from 4.39 to 794 ppb PFOS) were detected in the underlying native soil, which occurs below approximately 20 to 25 ft bgs.

In the D1 – Former HF Tar Neutralization Pit Area, the highest FC concentrations (up to 4,520 ppb PFOA) were detected in the 5 to 30 ft bgs depth range in borings constructed just outside the suspected location of the pit structure and decreased below 30 ft bgs in the native soils (ranging from 53.9 to 375 ppb).

In the D5 – Former Solids Burn Pit Area, concentrations of PFOS (up to 2,310 ppb) and PFOA (up to 1,375 ppb) were detected in soil samples to a depth of approximately 15 ft

[1] For reference, the Minnesota Department of Health (MDH) has established Soil Reference Values for industrial sites of 200,000 ug/kg (ppb) PFOA and 40,000 ppb PFOS.

bgs in the one soil boring constructed in this area. Lower concentrations were detected at lower depths (34.5 and 46.8 ppb PFOS and 21.8 and 42.5 ppb PFOA).

In the D8 – Former Waste Disposal Area, concentrations of PFOA (up to 543 ppb) and PFOS (up to 983 ppb) were detected in subsurface soils to a depth of 15 ft bgs and at a surface soil sample location downgradient of this area.

At the Fire Training Area, PFOS was detected at concentrations up to 1,820 ppb primarily in shallow soils to a depth of 5 ft bgs, with significantly lower concentrations detected at lower depths.

At the Building 15 (location of the former electrochemical fluorination cells) Area, PFOS was detected at concentrations up to 833/904(duplicate) ppb in shallow soils (0–5 ft bgs) and 1,865 ppb at a depth of 20 to 25 ft bgs. At the Former Wastewater Pond, PFOS was detected at a concentration of 805 ppb at a depth of 15 to 20 ft bgs and there was no visual evidence of historic sludges at this boring.

Surface soil samples (0-6 and 6-24 in bgs) collected in the vicinity of buildings where FCs were managed (Buildings 7, 16, and 25) generally indicated higher concentrations of FCs than samples collected in the vicinity of buildings where FCs were not managed (Buildings 22, 102, and 112), the incinerator complex, and the D6 – Former Ash Disposal Area.

The following data needs have been identified for soils at the 3M Cottage Grove facility:

- D5 – Former Solids Burn Pit Area. This area, which is approximately 2 acres in size, has not been defined with respect to the horizontal extent and concentrations of FCs. Historic records did not show specific limits or boundaries for this area. Only one boring was located in this area and soil samples from this boring exhibited concentrations of FCs primarily at 0 to 15 ft bgs.

- D8 – Former Waste Disposal Area. Due to access issues, this area is not defined with respect to the horizontal extent of any remaining waste burial, which was not previously removed.

- D9 - Former Sludge Disposal Pit. This newly identified area has not been assessed or characterized and will be referred to as the D9 Area.

Sediment – FCs were detected in sediment. Generally, upstream levels were less than downstream.

PFOA sediment concentrations in the east cove (11.7 to 28.7 ppb) are comparable to the west cove (4.11 to 38.7 ppb). PFOS sediment concentrations in the east cove (24.2 to 267 ppb) are higher than at the west cove (15.2 to 91.1 ppb). Higher PFOS concentrations were detected in the shallow sediments (0-10 cm) of the east cove than in the deeper sediments (10-20 cm).

In the Mississippi River, average sediment concentrations at sample location R1, R2, and R4 were NQ or ND. The average sediment concentrations (8.28 and 13.2 ppb, respectively) of PFOS and PFOA were detected at sample location R3, which is adjacent to the operating plant portion of the property.

Surface Water - The average concentrations of FCs in the east cove water sample were greater than the concentrations detected in the west cove water sample. In the Mississippi River, PFOA and PFOS concentrations were ND or NQ at the R1 through R4 sampling locations. The only quantifiable concentrations of PFOS and PFOA (0.098 and 0.132 ppb, respectively) in the water samples were detected at downstream location R5. With respect to sediment and surface water, the following data needs have been identified:

- Concentrations, if any, of FCs in groundwater entering the river (pore water) are not known.
- Distribution, if any, of FCs in surface waters and sediment extending across the river are not known.

Fish - The analytical results indicate that FCs have been detected in fish samples (whole body and filet) collected from three reaches of the Mississippi River in the immediate vicinity of the Cottage Grove facility. The FCs were detected in each of the three species sampled: Channel catfish, Bluegill sunfish, and Smallmouth bass.

The following conclusions have been identified for Mississippi River fish:

- The current data set represents one limited round of fish sampling conducted in the Mississippi River.
- Pending analytical work being performed on additional fish samples by the MPCA, further discussions may be warranted relative to additional data needs.

RECOMMENDATIONS

Substantial characterization has been completed at the 3M Cottage Grove facility as part of the work conducted in 2005. However, data needs were identified and should be addressed in order to define the most effective path forward. These additional field activities are presented in the following recommendations:

Groundwater

- Based on accessibility, install a total of three to five groundwater monitoring wells, if feasible (based on physical constraints and access considerations), downgradient of the D2 and D5 areas toward the river.
- Install two to three groundwater monitoring wells around the perimeter of the Former Sludge Disposal Pit (D9 Area) to determine groundwater quality and flow direction.
- Define the hydraulic capture and effect of pumping wells PW5 and PW6 by collecting water level and drawdown data from existing monitoring wells.

Soil

- D5 – Former Solids Burn Pit Area. Install an additional three to five soil borings to 25 ft bgs to further characterize the extent of FCs in this area.
- D8 – Former Waste Disposal Area. Review information on past survey and remediation activities conducted in this area. Based on a review of this information and accessibility constraints, determine if a geophysical survey would be necessary to further define the horizontal extent of any remaining waste burial at this location.
- D9- Former Sludge Disposal Pit. Install two to four soil borings to 25 ft bgs to characterize the extent of FCs, if any, in this area.

Pore Water/Surface Water/Sediment

- Collect pore water samples using shallow hand-driven well points at approximately 25 locations in the Mississippi River along the facility shoreline to assess possible groundwater discharge through bottom sediments and into the river.
  - 20 equally spaced sampling locations along approximately 4,000 ft of shoreline between the D8 Area and the east cove. Conduct a groundwater flow net analysis to define the most effective locations for these samples.
  - Five locations in the reach between the west cove and monitoring well MW-14 to detect any groundwater discharge.
- Collect paired surface water/sediment samples at the following sampling locations:
  - Pore water sampling locations (25 samples).
  - East and west coves and associated drainageways (up to 6 samples).
- Collect surface water samples along a transect across the Mississippi River in Reach 3/5 area (estimate 10-15 sampling nodes).

Fish/Aquatic Biota

- Review pending MPCA fish sampling results. Discuss with MPCA, Minnesota Department of Health (MDH), and Minnesota Department of Natural Resources (MDNR) plans for additional fish sampling in the river to determine the path forward.

Table ES-1 provides a summary of the recommended Phase 2 FC assessment, which would be performed under the existing Health and Safety Plan (HASP) and FC Work Plan. The results of the Phase 2 FC assessment will be documented in the Phase 2 FC Data Assessment Report.

Table ES-1
Summary (by Media) of the Phase 2 FC Assessment
3M Cottage Grove, MN Facility

Media	No. of Samples/Locations/Description of Activity
1. Groundwater (Up to 8 samples*)	a. Install 3 to 5 groundwater monitoring wells downgradient of D2 and D5. Collect up to 5 groundwater samples. b. Install 2 to 3 groundwater monitoring wells around the perimeter of the Former Sludge Disposal Pit (D9 Area). Collect up to 3 groundwater samples. c. Conduct hydraulic study of pumping wells PW-5 and PW-6 which will be coordinated with the upcoming scheduled shutdown of PW-6 for incinerator maintenance.
2. Soil (Up to 45 samples*)	a. Up to 45 sub-surface soil samples collected from 5 to 9 soil borings as follows: – Up to 25 soil samples at D5 Area - Former Solids Burn Pit Area. One composite soil sample for each 5 ft interval (3 to 5 borings to 25 ft). – Up to 20 soil samples at D9 Area - Former Sludge Disposal Pit. One composite soil sample for each 5 ft interval (2 to 4 borings to 25 ft). b. Based on a review of past information and accessibility constraints,determine if a geophysical survey of the D8 - Former Waste Disposal Area would be necessary.
3. Pore Water (Approx. 25 samples*)	a. 25 pore water samples in the Mississippi River as follows: – Conduct groundwater flow net analysis to locate pore water stations. – 20 water samples between the D8 Area and the east cove. – 5 water samples in the reach between the west cove and MW-14.
4. Surface Water (At least 46 samples*)	a. At least 46 surface water samples collected as follows: – 25 surface water samples at pore water sampling locations (paired with sediment) in the Mississippi River. – Up to 6 surface water samples at the east and west coves and associated drainageways (paired with sediment). b. Up to 15 surface water samples along a transect across the Mississippi River in Reach 3/5 area.
5. Sediment (At least 31 samples*)	a. At least 31 sediment samples collected as follows: – 25 sediment samples at pore water sampling locations (paired with surface water) in the Mississippi River. – Up to 6 samples at the east and west coves and associated drainageways (paired with surface water).

* Actual number will be based upon conditions encountered in the field.

1. INTRODUCTION

1.1 BACKGROUND

The 3M Company (3M) Cottage Grove, Minnesota facility, formerly the 3M Chemolite facility, has been in operation since 1947. The facility currently manufactures a range of products some of which include adhesive products, specialty paper, industrial polymers, abrasives, and reflective road sign materials and also engages in research and development of a proprietary nature.

3M expressed its intention to voluntarily assess the presence of fluorochemicals associated with the manufacturing operations at the Cottage Grove facility. The fluorochemicals (FCs) include the following compounds:

- Perfluorooctanoic acid (PFOA) – An 8-carbon (C8) carboxylate.
- Perfluorooctane sulfonate (PFOS) – An 8-carbon (C8) sulfonate.
- Perfluorohexane sulfonate (PFHS) – A 6-carbon (C6) sulfonate.
- Perfluorobutane sulfonate (PFBS) – A 4-carbon (C4) sulfonate.

In December 2004, 3M prepared the *Facility-wide Fluorochemical (FC) Investigation Work Plan* (FC Work Plan) to assess these FCs at its Cottage Grove, Minnesota plant. The Work Plan presented a systematic approach to collect data in various environmental media related to FC manufacturing operations. In a letter to 3M dated January 31, 2005, the MPCA approved the Work Plan with modifications.

During 2005, 3M implemented the FC site-related investigative program of its Cottage Grove, Minnesota facility in accordance with the MPCA-approved FC Work Plan. This document is the Data Assessment Report for the facility-wide FC assessment.

It is important to note that groundwater sampling for FCs at four monitoring wells (MW-4, MW-7, MW-101, and PZ-14) and the tap at Bldg. 116 is conducted on a semiannual basis in accordance with 3M's Letter of Intent (LOI) to the United States Environmental

Protection Agency (U.S. EPA) dated March 13, 2003. This periodic sampling is reported to the U.S. EPA under the LOI program. The data collected under the LOI program from 2003 through 2005 are included in this report to supplement the data collected under the FC Work Plan.

Additionally, wastewater treatment plant (WWTP) effluent sampling for FCs was conducted on a monthly basis in 2003 and 2004 and quarterly in 2005 in accordance with a facility National Pollutant Discharge Elimination System (NPDES) permit and the LOI program. This sampling is reported to the MPCA and U.S. EPA under the NPDES and LOI programs. The data collected under the LOI and NPDES programs from 2003 through 2005 are included in this report to supplement the data collected under the FC Work Plan.

1.2 PURPOSE OF THE FLUOROCHEMICAL (FC) ASSESSMENT

The purpose of the FC assessment is to:

- Characterize the presence of these FCs at the site in various media and in the adjacent Mississippi River.
- Identify through a file review and interviews, historic off-site disposal locations of facility waste streams.
- Prepare this Data Assessment Report.

2. ENVIRONMENTAL SETTING

2.1 SITE LOCATION AND DESCRIPTION

The 3M Cottage Grove, Washington County, Minnesota facility is located approximately two miles southeast of the City of Cottage Grove (see Figure 2-1) and is approximately 1700 acres in size. The industrial, developed portion of the site is approximately 200 acres.

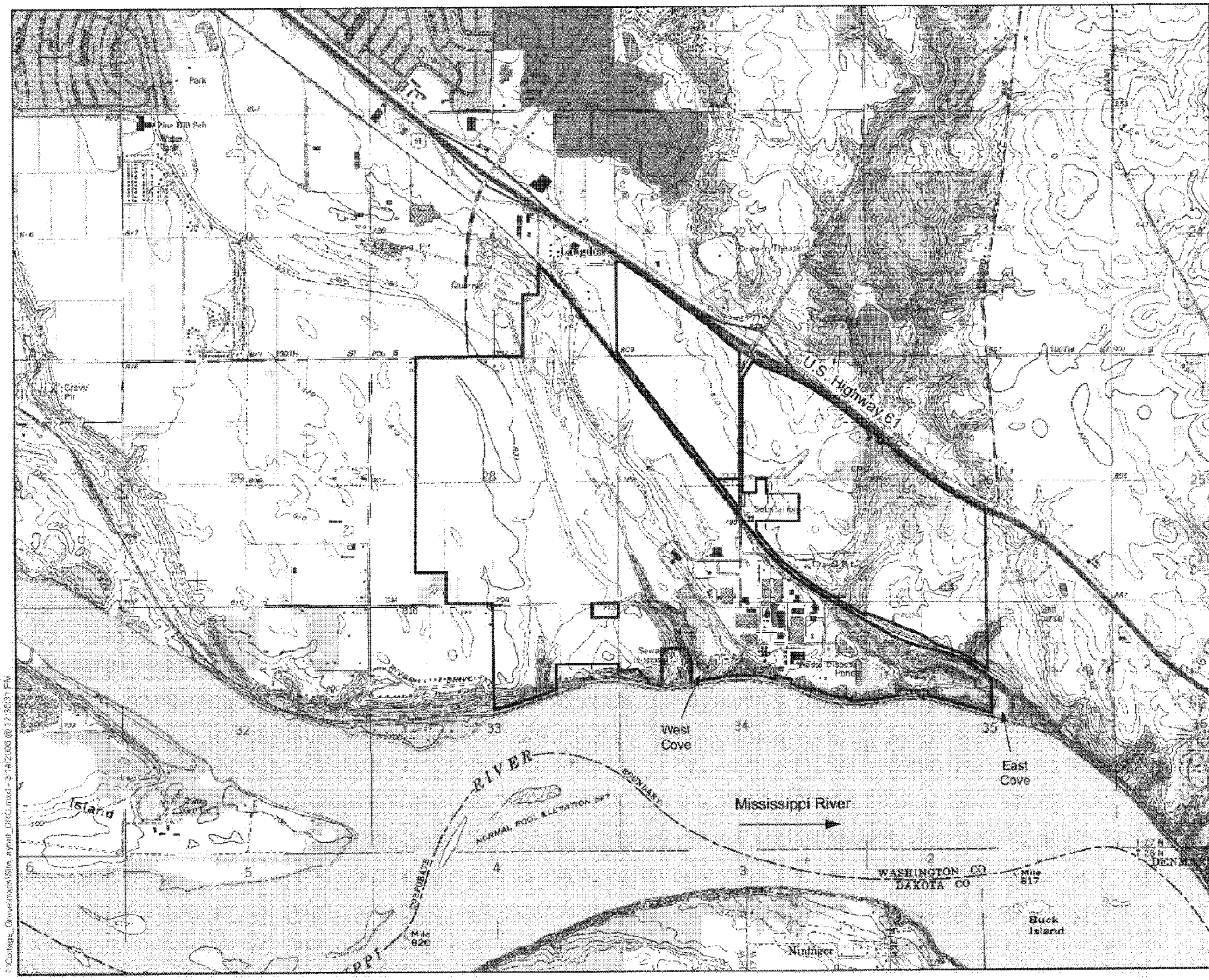
Bordering the site to the south is the Mississippi River; to the west is farmland and some residences; to the north is U.S. Highway 61 and farmland with some residences; and to the east are residential areas, a golf course, woodland, and farmland.

The plant operations and developed portion of the site are located on the southern part of the property adjacent to the river as shown in Figure 2-2. There are some groundwater monitoring and production wells on the northern portion of the property, but no industrial or production operations occur there. The Eagles Point Wastewater Treatment Plant (WWTP) is located along the Mississippi River west of the developed portion of the site. It is operated by the Metropolitan Council Environmental Services (MCES). Additionally, there is a parcel on the interior portion of the property that is owned by Cogentrix, which operates a cogeneration plant. This electrical power generation plant provides steam to the 3M Cottage Grove facility.

The property is bisected by a railroad right-of-way. There is another railroad right-of-way along the bank of the Mississippi River.

2.2 LAND USE AND DEMOGRAPHICS

The 3M Cottage Grove facility is located in Washington County. As indicated in Section 2.1, the area immediately surrounding the facility is comprised predominantly of farmland and woodland, with some residences primarily to the west and east of the facility, and a wastewater treatment plant (Eagles Point) to the southwest.



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Legend

☐ Property Lines

Source: St. Paul Park, MN
USGS Quadrangle 1967
Revised 1993

0 1,000 2,000 Feet

Figure 2-1
Site Location Map
3M Cottage Grove, MN

Figure 2-2
Site Layout

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In recent years, Washington County has experienced significant economic and population growth. The continued expansion of the Twin Cities metropolitan area has caused a spread of developed areas in the cities of Cottage Grove, Woodbury, and Oakdale. Cottage Grove is the nearest city to the 3M plant approximately 2 miles to the northwest. Woodbury and Oakdale are approximately 7 and 10 miles north of the City of Cottage Grove, respectively.

While much of Washington County has retained its rural atmosphere, the county comprises various areas consisting of farmland, woodlands, residential neighborhoods, and office and retail complexes along Interstate 94 near Woodbury and Oakdale (2004, *www.co.washington.mn.us*).

2.3 TOPOGRAPHY AND DRAINAGE

The 3M Cottage Grove property is located on a flat to gently undulating bluff overlooking the main channel of the Mississippi River. Relief over most of the property is only on the order of tens of feet, ranging in elevation from a high of 822 feet above mean sea level (msl) on the northern portion to 780 feet msl on the southern portion at the edge of the bluff.

As shown in Figure 2-1, the southern portion of the site has been deeply incised by streams and drainage both east and west of the plant operations area, and along the Mississippi River, relief is quite steep with land surface elevations ranging from approximately 780 feet msl at the top of the bluff to approximately 700 feet msl at the riverbank. The western drainageway terminates at a cove (west cove), which flows to the Mississippi River. The eastern drainageway originates from a pond north of U.S. Highway 61, and follows a southerly direction until it approaches the plant operations area where it receives the NPDES-permitted discharges from the plant's wastewater treatment and cooling water system. The drainageway terminates at a cove (east cove), which drains to the Mississippi River.

2.4 GEOLOGY

As shown on cross section A-A' (Figure 2-3), the 3M Cottage Grove facility is directly underlain by fill material and unconsolidated glacio-fluvial deposits of probable Quaternary age. The location of the cross section is shown in Figure 2-4. In the northern portion of the property, unconsolidated deposits range from a few feet to a few tens of feet in thickness, are dry, and are unimportant as potential sources of water supply. The unconsolidated deposits increase in thickness from north to south across the site and are over 100 feet thick near the Mississippi River where a buried bedrock valley exists.

The boring for monitoring well MW-11 encountered talus slope materials at approximately 135 feet below ground surface (bgs) (drill cuttings were identified as Oneota Dolomite) and drilled into the Jordan Sandstone at a depth of 168 feet bgs. Thus, south of the paleo-bluff, unconsolidated glacio-fluvial materials exceed 135 feet in thickness, and at least locally, become important sources of groundwater supply.

An erosional unconformity lies between the base of the unconsolidated deposits and the bedrock beneath the facility. The youngest bedrock in subcrop at the facility is the Shakopee and Oneota Dolomites of the Prairie du Chien Group (early Ordovician age). Inspection of well completion logs for monitoring and production wells at the facility indicates that these formations underlie much of the northern portion of the property, through the central plant area south to a paleo-bluff (the boundary of the buried bedrock valley) as shown in Figure 2-3. The bedrock surface closely mimics the present-day topography and the cliff line of the bedrock paleo-bluff appears to be located parallel to the Mississippi River.

Underlying the Shakopee and Oneota Formations is the Jordan Sandstone. Several production wells at the site tap this formation for water supply. The St. Lawrence Formation (a confining layer – shale unit) is present at the base of the Jordan Sandstone, approximately 200 feet below the central portion of the site.

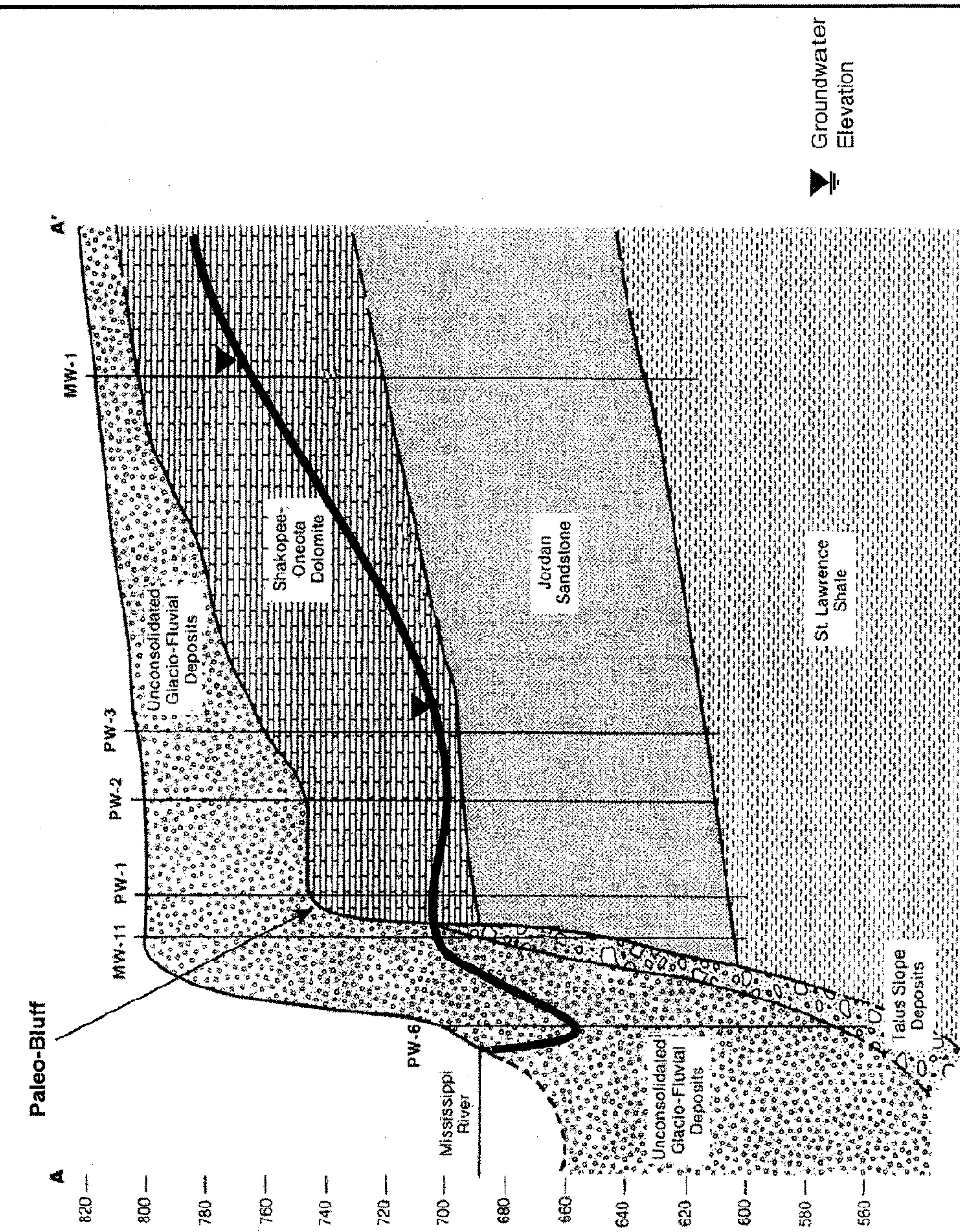
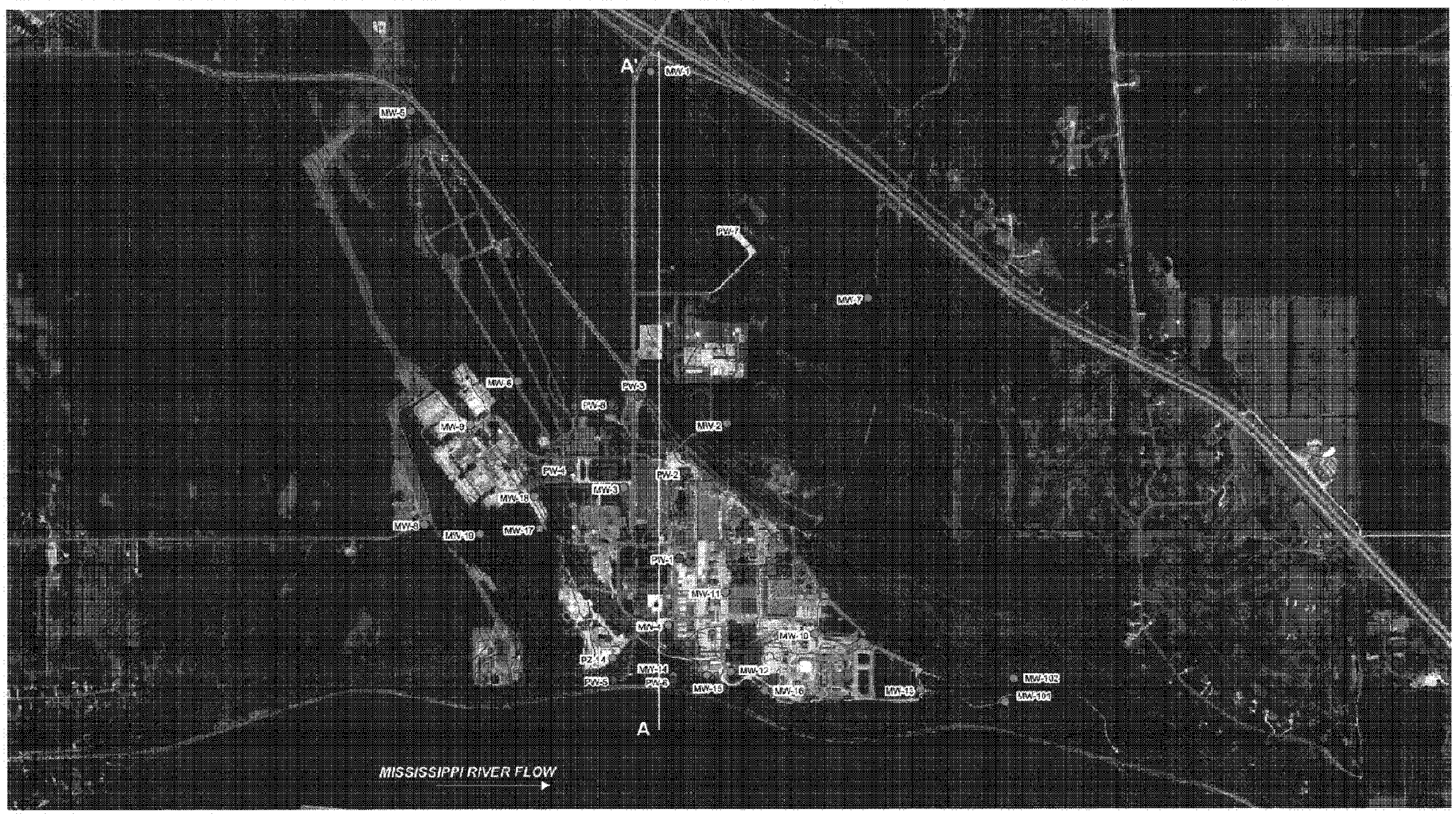


FIGURE 2-3 GENERALIZED STRATIGRAPHIC CROSS SECTION A-A'
3M COTTAGE GROVE, MN FACILITY

04P-1456-3



Legend:

- Monitoring Well
- Production Well
- Topographic Contours
- A —— A' Cross Section

Note: Well Locations are Approximate

N, E, S, W

0 500 1,000
Feet

Map Source:
U.S. Department of Agriculture, Farm Services Agency, Aerial Photography Field Office;
National Agricultural Imagery Program (NAIP) Digital Orthorectified Images (DOQ), Minnesota, 2003

FIGURE 2-4
CROSS SECTION A-A' LOCATION
3M COTTAGE GROVE, MN FACILITY

2.5 WATER USAGE AND HYDROGEOLOGY

All site production and monitoring wells are completed in the upper water-bearing stratigraphic units at the site. The upper water-bearing units consist of the Shakopee-Oneota Dolomites, Jordan Sandstone, and unconsolidated deposits. Due to the presence of the paleo-bluff, the Jordan Sandstone and Shakopee-Oneota Dolomites are hydraulically connected to the unconsolidated deposits near the Mississippi River. Literature indicates that the underlying St. Laurence Shale is not considered an aquifer but rather a confining unit because it has low vertical permeability to groundwater (Lindholm, et al., 1974).

There are six production wells (PW-1 through PW-6) that supply water for industrial and sanitary purposes at the facility. The six production wells were installed during the period 1947 to 1970. Wells PW-1 through PW-4 are drilled into the Jordan Sandstone. Wells PW-5 and PW-6 are completed entirely in the unconsolidated deposits near the Mississippi River.

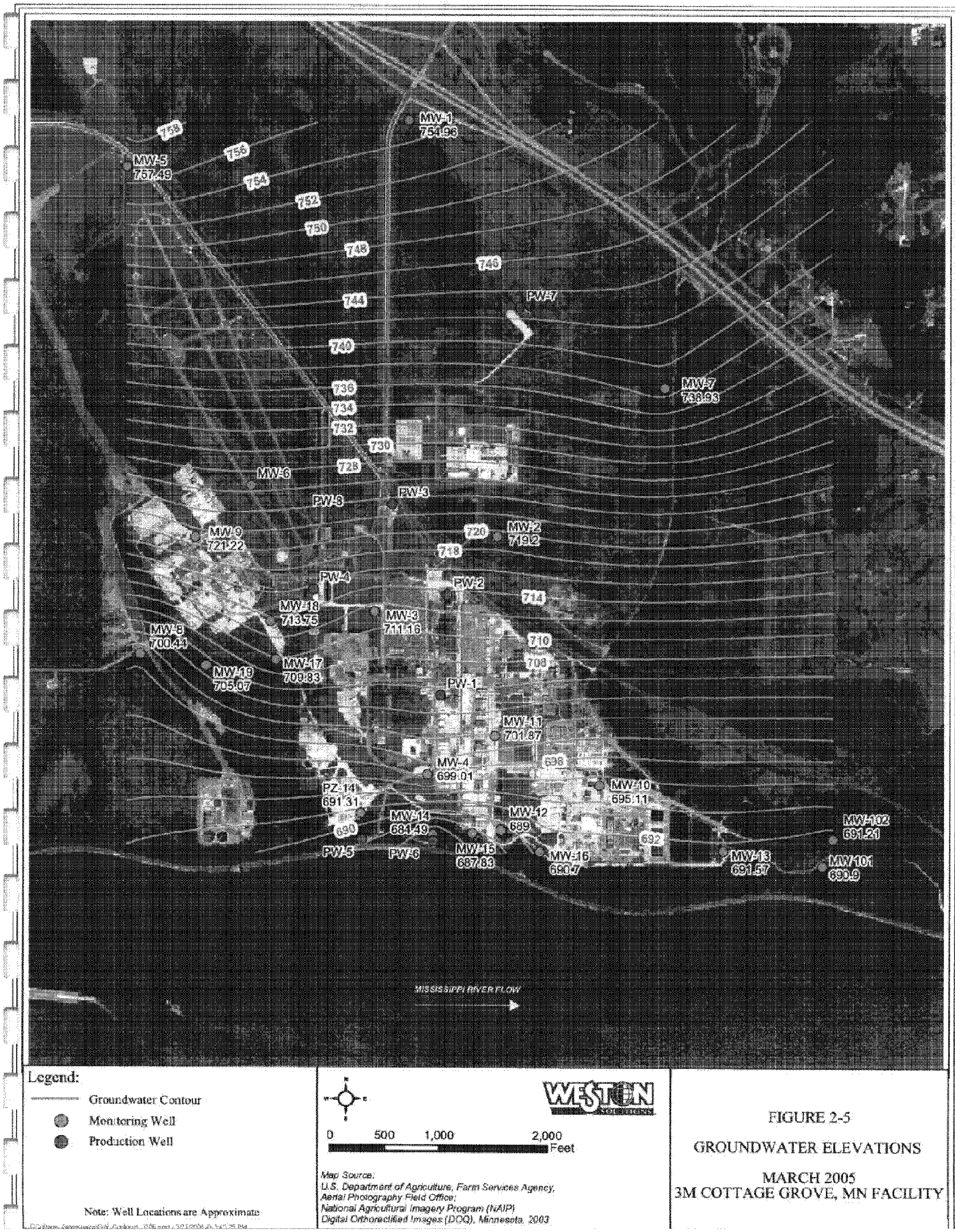
The groundwater from four of the production wells (PW-2 through PW-5) is blended on a continuous basis in a water supply distribution system for various site needs, including production and sanitation. Bottled water or water treated by granular activated carbon (GAC) is supplied for drinking. The remaining two production wells are utilized independently on a periodic basis for site-wide fire protection (PW-1) and non-contact cooling for the site incinerator (PW-6). All groundwater used for production processes is treated after use at the on-site wastewater treatment facility, prior to an NPDES-permitted discharge to the eastern drainageway (east cove) leading to the Mississippi River. The on-site groundwater obtained for non-contact cooling is supplemented by groundwater from the 3M Woodbury Site located north of the plant which is conveyed to the facility by underground piping. Once utilized for cooling, the non-contact cooling water is discharged to an on-site cooling water pond prior to permitted discharge to the eastern drainageway where it is combined with the wastewater treatment discharge.

Two additional wells (PW-7 and PW-8) are used for water supply on an as needed basis. PW-7 is located at the Trap Range and PW-8 is located adjacent to a guard house at the plant entrance.

There are also eight groundwater monitoring wells (MW-1 through MW-8) that were installed during a 3M study between 1974 and 1975 in order to maintain an ongoing record of groundwater levels. Monitor well PZ-14 was subsequently added for this activity. A ninth monitor well (MW-9) was installed on the west side of the plant to monitor groundwater conditions at the former coal storage pile area located north of the incinerator facility. An old production well was discovered in 1981 on the east side of the plant near the wastewater treatment facility and was redesignated as monitor well MW-10. During the 1980s, monitoring wells MW-11 through MW-16 were installed to monitor several past waste disposal areas and an ammonium sulfate release near the WWTP. In the late 1990s monitoring wells MW-17, MW-18, and MW-19 were installed to monitor groundwater conditions at the closed ash/sludge landfill south of the incinerator. Monitoring wells MW-101 and MW-102 were installed in 2002 at a former disposal area (D1 Area) to assess the area southeast of the production area. Figure 2-4 shows the locations of the monitoring and production wells which are known to exist at the facility.

Groundwater elevation data indicate a natural southerly groundwater gradient toward the Mississippi River from the 3M property. Figure 2-5 depicts the configuration of the water table surface at the plant in March 2005. Groundwater levels have been measured and contoured several times and the water table surface configurations have remained relatively consistent.

Pumping of the production wells, which commenced in 1947, has depressed the groundwater table below the active portion of the plant property with hydraulic gradients directed towards the production wells.



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3. SUMMARY OF FIELD ACTIVITIES

The FC assessment field activities were conducted in accordance with the FC Work Plan and Health and Safety Plan (HASP) (Appendix B to the FC Work Plan). Field procedures were consistent with MPCA site characterization and sampling guidance. Any deviations from the FC Work Plan are identified in the following sections of this Data Assessment Report.

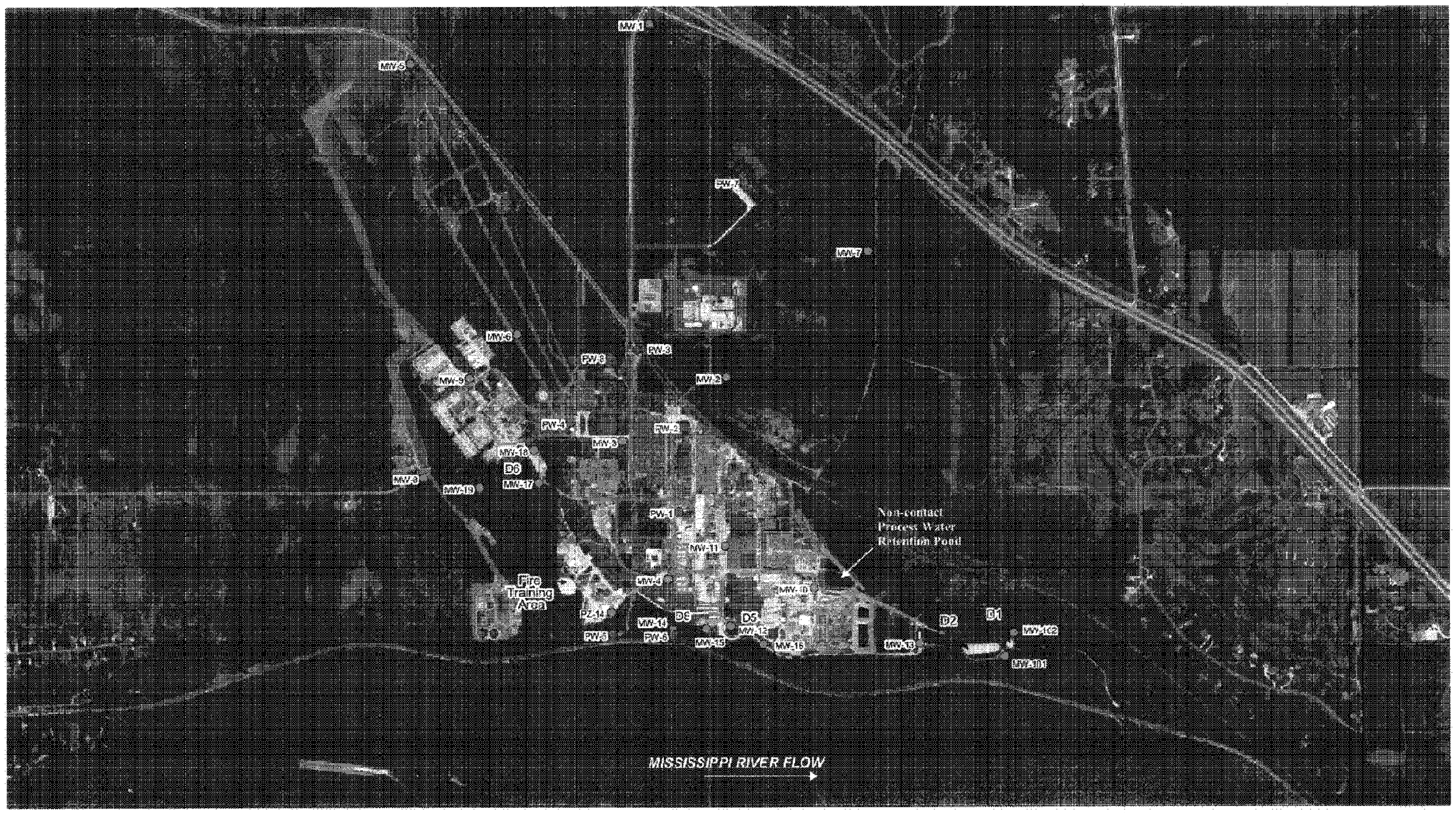
3.1 DESCRIPTION OF THE GROUNDWATER ASSESSMENT

3.1.1 Background

The FC Work Plan specified that groundwater sampling would be conducted at all 22 active monitoring wells, six production and two water supply wells at the 3M Cottage Grove facility, as well as the tap at the Bldg 116 cafeteria. Additionally, sampling of four 3M Woodbury disposal site (Woodbury Site) pumping wells, the combined discharge from these wells, and the discharge from the non-contact process water retention pond at the 3M Cottage Grove facility would be conducted on a monthly basis for three months. The Woodbury Site is owned by 3M and is approximately five miles north of the 3M Cottage Grove facility. Water is pumped from the four production wells at the Woodbury Site through an underground pipeline to the 3M Cottage Grove plant for use as non-contact process water. Once through the plant, the water is discharged to a retention pond.

3.1.2 On-site Groundwater Sampling

Groundwater sampling was conducted at the 3M Cottage Grove facility from March 11 through March 17, 2005 and on May 16, 2005. Figure 3-1 shows the groundwater monitoring well and production well locations at the facility and Table 3-1 presents a groundwater sampling summary. Water levels were recorded onto well evacuation/sampling forms for each of the monitoring wells. A copy of the well evacuation/sampling forms is provided in Appendix A. After measuring water levels, the wells were purged and sampled in accordance with the MPCA-approved FC Work Plan.



Legend:
- Monitoring Well
- Production Well
- Potential Source Area

Note: Well Locations are Approximate

N W E S

0 500 1,000
Feet

WESTON SOLUTIONS

Map Source:
U.S. Department of Agriculture, Farm Services Agency, Aerial Photography Field Office;
National Agricultural Imagery Program (NAIP) Digital Orthorectified Images (DOQ), Minnesota, 2003

FIGURE 3-1
WELL LOCATIONS
3M COTTAGE GROVE, MN FACILITY

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WESTON SOLUTIONS
Restoring Resource Efficiency

Table 3-1 Groundwater Sampling Summary – On-site Wells
3M Cottage Grove, MN Facility

Sampling Location	Well Depth (ft bgs)	Measured Well Depth (ft toc)	Depth to Water (ft toc)	Well Diameter (in)	Volume Purged (gal)	Pump Rate[a] (gpm)	Date Sampled
MW-1[b]	200	92.64	67.71	6	585	-	03/16/05
MW-2[b]	192	92.00	85.91	6	8 - Dry	-	03/15/05
MW-3	210	196.75	99.40	6	440	-	03/16/05
MW-4[b]	200	133.20	108.25	6	425	-	03/16/05
MW-5	210	208.70	51.57	6	695	-	03/16/05
MW-6[b]	219	103.20	Dry[d]	6	NS	-	03/16/05
MW-7	146	140.24	55.07	6	375	-	03/16/05
MW-8[c]	173	172.45	65.45	6	490	-	05/16/05
MW-9	104	107.95	47.17	4	120	-	03/15/05
MW-10	237	241.50	93.73	8	1,182	-	03/16/05
MW-11	200	186.60	102.90	4	165	-	03/12/05
MW-12	141	141.03	93.63	4	35 - Dry	-	03/15/05
MW-13	134	134.00	92.03	4	97	-	03/12/05
MW-14	64	59.00	26.85	4	24 - Dry	-	03/16/05
MW-15	186	186.54	96.08	4	192	-	03/12/05
MW-16	140	141.10	93.78	4	103	-	03/12/05
MW-17	112	114.36	75.28	4	78	-	03/15/05
MW-18	92	93.20	69.07	4	50	-	03/15/05
MW-19[c]	120	120.00	52.33	4	10 - Dry	-	05/16/05
MW-101	100	101.90	94.87	2	3.5	-	03/12/05
MW-102	96	94.67	91.97	2	1.5	-	03/12/05
PZ-14	100	187.71	64.26	2	72.5	-	03/15/05
PW-1	205	NA	76[e]	14	8,100	729	03/14/05
PW-2	202	NA	81[e]	20	6,000	749	03/14/05
PW-3	224	NA	96[e]	24	11,320	924	03/14/05
PW-4	275	NA	112[e]	24	12,255	817	03/14/05
PW-5	150	NA	30[e]	36	21,000	1481	03/14/05
PW-6	143	NA	31[e]	20	57[f]	576	03/14/05
PW-7	200	NA	75[e]	4	250	10	05/16/05
PW-8	208	NA	108[e]	4	219	2	03/14/05
Bldg 116 Tap	-	-	-	-	30	-	03/14/05

[a]Pumping rates were provided by the facility based on 2004 measurements.
[b]Measured depths are significantly shallower than previously recorded total depths suggesting borehole collapse. At MW-6, a sample could not be collected.
[c]Wells contained dedicated pumps that were inoperative. Pumps were removed and samples were collected May 16, 2005.
[d]Well was dry due to obstruction in borehole. No sample collected.
[e]Water depths are from historic records.
[f]Well pump runs continuously. As a result, only a small volume of water was purged through sampling port.
NA - Not available.
- Not applicable.
ft bgs – Feet below ground surface.
ft toc – Feet below top of casing.
in – inches.
gal – gallons.
gpm – gallons per minute.

During the measurement of water levels, it was noted that some of the deep bedrock wells exhibited shallower total depths than originally recorded. It is believed that the difference in depth is due to borehole collapse within the Jordan Sandstone. Groundwater purging volumes at these locations were calculated based on the original well depths. In some instances, the wells were dry (MW-6), or exhibited low volumes of water accessible for purging, resulting in the well purging dry before the calculated volume was obtained. This was noted on the well evacuation/sampling form and samples were collected where possible.

During the March 2005 groundwater sampling event, four wells could not be sampled, including MW-6, MW-8, MW-19, and PW-7. Monitoring well MW-6 was dry and a sample could not be collected. A total depth was measured at 103.2 feet below top-of-casing (TOC) while the previously recorded total well depth for MW-6 was 219 feet below TOC.

Two monitoring wells, MW-8 and MW-19, contained dedicated pumps that were not operational at the time of sampling. Sampling at these locations was postponed until the pumps could be removed in early May 2005 and groundwater samples were collected on May 16, 2005.

Production well PW-7 was not sampled in March due to frozen pipes. Sampling at this well was postponed until May to allow the pipes to thaw and PW-7 was sampled on May 16, 2005.

All groundwater samples were submitted to Exygen Research in State College, Pennsylvania for FC analyses, which include PFOA, PFOS, PFBS, and PFHS.

3.1.2.1 Monitoring Wells

In accordance with the FC Work Plan, monitoring wells were purged a minimum of three well volumes or until they purged dry before sampling was conducted. Temperature, specific conductivity, and pH were measured during the purging process so that representative groundwater samples could be collected after these parameters stabilized. This data was recorded on the well evacuation/sampling forms. Following purging, the wells were allowed to stabilize to minimize the suspended particulate in the sample media. Groundwater samples were collected using disposable polyethylene bailers and poured into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 degrees Celsius (°C). The sample information was entered onto a Chain-of-Custody (COC) that accompanied the samples to the laboratory.

3.1.2.2 Production and Water Supply Wells

Due to the necessity in maintaining the operation of the production wells, actual water levels could not be recorded. As a result, data was obtained from the facility regarding average flow rates for each of the production wells. Information was also gathered on the well construction and the frequency of use. Based on this information, purge volumes were calculated.

Since production well PW-6 was operating continuously at the time of sampling, it was not necessary to purge this well. However, a groundwater sample was collected after allowing sufficient purging to clear the sample line. The remaining production and water supply wells were being operated intermittently at the time of sampling. These wells were turned on manually and kept in operation until the calculated three well volumes were purged. Some of the wells (PW-1, PW-2, PW-3, PW-5, and PW-8) were constructed with flow meters allowing direct measurement of the flow. Other wells (PW-4 and PW-7) did not have flow meters. For these, well volumes were measured based on the average flow data provided by the facility and length of time purged. A summary of the flow rate data and purged volumes is presented in Table 3-1.

Groundwater samples from each of the production and water supply wells were collected directly from sampling ports within the pump houses. The valves were turned on, water was allowed to flow sufficiently to clear the lines, and then the water was poured into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.

3.1.2.3 Building 116 Tap

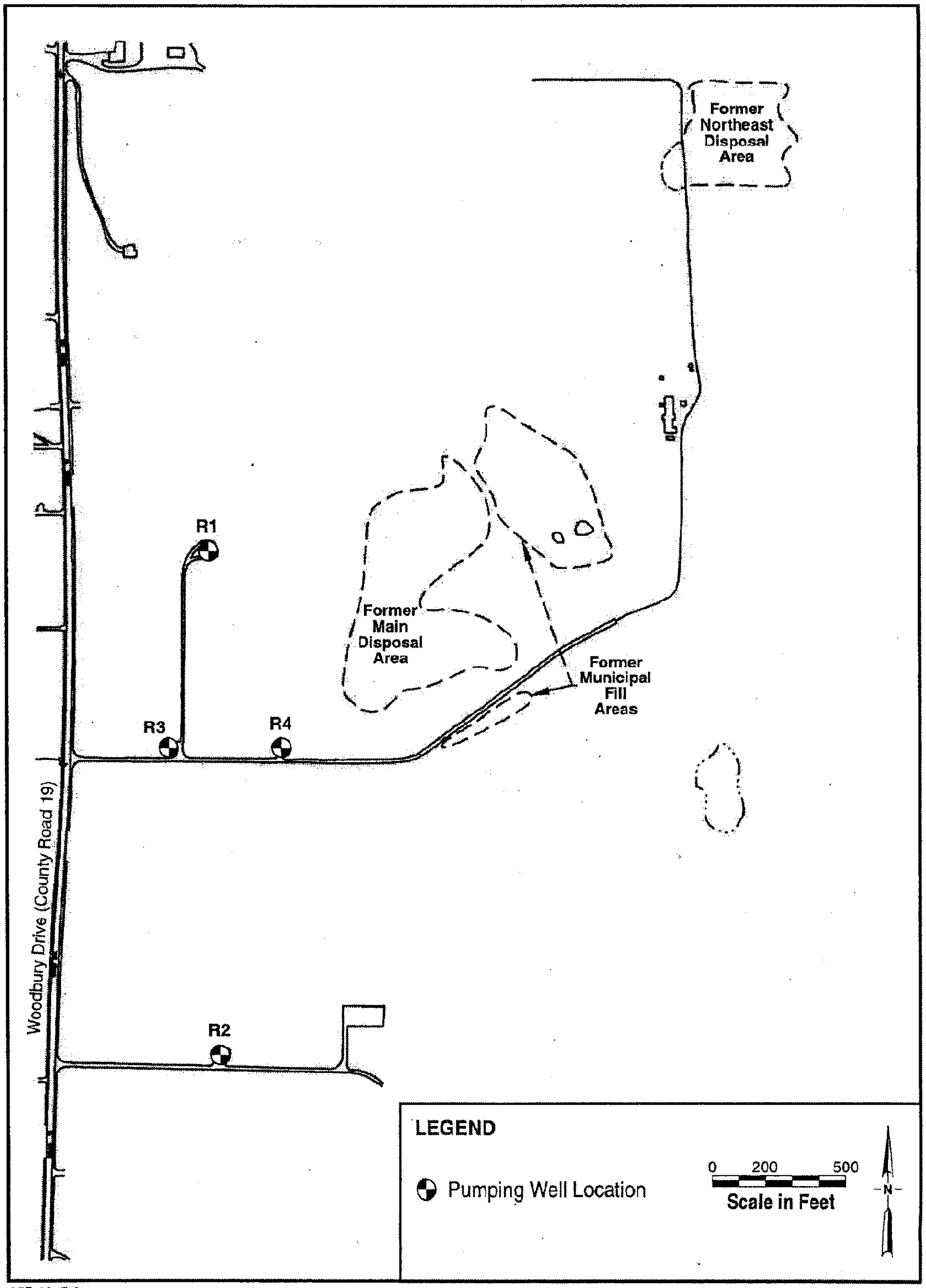
The water at this location is treated with a granular activated carbon (GAC) filter prior to use at the tap. This is the only building on the Cottage Grove facility that utilizes treated well water for potable water purposes. All other buildings are supplied with bottled water.

One water sample was collected from a water tap at the Building 116 cafeteria. The sample was collected downstream of the carbon filter from a faucet at the cafeteria kitchen sink where previous samples had been collected. Prior to sampling, the faucet was turned on and allowed to purge for 15 minutes. The estimated purge rate was two gallons per minute (gpm). Following purging, the sample was collected directly into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.

3.1.3 Woodbury Site Sampling

Groundwater samples were collected from each of the four Woodbury Site production wells, the combined discharge from the wells, and the discharge from the non-contact process water retention pond on March 14, April 5, and May 12, 2005. Figure 3-2 shows the production well locations at the Woodbury Site. A sampling summary is presented in Table 3-2.

Due to the necessity in maintaining the operation of the four Woodbury Site production wells, actual water levels could not be recorded. Since the production wells operate continuously, it was not necessary to purge three well volumes.



05P-0915-9

FIGURE 3-2
PRODUCTION WELL LOCATIONS
WOODBURY SITE

Table 3-2 Sampling Summary – Woodbury Site Production Wells and Non-Contact Process Water

Sampling Location	Volume Purged (gal)	Pump Rate[a] (gpm)	Dates Sampled
Woodbury Site R1	5[b]	884	03/14/05, 04/5/05, & 05/12/05
Woodbury Site R2	5[b]	141	03/14/05, 04/5/05, & 05/12/05
Woodbury Site R3	5[b]	487	03/14/05, 04/5/05, & 05/12/05
Woodbury Site R4	5[b]	1,537	03/14/05, 04/5/05, & 05/12/05
Woodbury Site Combined Discharge at Bldg 56	2	-	03/14/05, 04/5/05, & 05/12/05
Discharge from Retention Pond	0	-	03/14/05, 04/5/05, & 05/12/05

[a]Pumping rates were provided by the facility based on 2004 measurements.
[b]Well pump runs continuously. As a result, only a small volume of water was purged through sampling port.
- Not applicable.

Groundwater samples from each of the production wells were collected directly from sampling ports within the pump houses. The valves were turned on, water was allowed to flow sufficiently to clear and purge the lines, and then the water was poured into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.

The combined discharge from the Woodbury Site production wells was sampled directly from the non-contact process water supply line that enters the 3M Cottage Grove facility at Building 56. A sampling port on the supply line was opened and allowed to purge sufficiently to clear the line. The sample was collected directly from the port into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.

The non-contact process water was sampled after it had been through the plant. The water is discharged into an open retention pond. The sample was collected from an established monitoring point located at the discharge for the pond. The sample was collected by lowering a disposable polyethylene bailer into the discharge flow to collect the water sample. The water was poured into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory.

All water samples were submitted to Exygen Research in State College, Pennsylvania for FC analyses.

3.2 DESCRIPTION OF THE SOIL ASSESSMENT

3.2.1 Background

Based upon a review of the historical activities conducted at the plant, the focus of the soil sampling program was the known and potential FC management areas (production, fire training, etc.). Additionally, soil samples were collected in other areas of the plant to gain an overall understanding of the FC distribution in soils on a plant-wide basis.

In accordance with the FC Work Plan and MPCA-requested Work Plan modifications, the following areas at the 3M Cottage Grove, Minnesota facility were assessed through the collection of subsurface soil samples from soil borings and/or surface soil samples:

- D1 – Former HF Tar Neutralization Pit
- D2 – Former Sludge Disposal Area
- D5 - Former Solids Burn Pit Area
- D8 – Former Waste Disposal Area
- Fire Training Area
- Building 15 Area
- Former Wastewater Pond Area
- D6 - Former Ash Disposal Area
- Incinerator Complex
- General Plant Area
- Background Areas (vicinity of monitor wells MW-5 and MW-7)

All soil samples were analyzed for FCs and a subset of these samples was analyzed for sieve (grain size) and total organic carbon (TOC).

3.2.2 Description of Soil Boring Sampling

From May 15 to May 26, 2005, a total of 16 soil borings were installed at the 3M facility using hollow-stem auger drilling techniques. A total of 116 composite soil samples were collected from 5-ft intervals using split-spoon samplers continuously to boring termination for descriptive logging and analytical testing. The soil was logged by an experienced geologist noting color, texture, moisture content, and any odors or discoloration. The soil samples were also screened using an organic vapor meter (OVM). OVM readings were recorded on the soil boring logs.

After descriptive logging, soil samples were collected from each five-foot interval, placed in a stainless steel bowl, and blended until homogenized. The composited soil was placed into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory. In accordance with the FC Work Plan, duplicate media samples and rinsate blank samples were collected as specified in the sampling protocol.

Soil samples were submitted to Exygen Research in State College, Pennsylvania for FC analyses. Twelve samples were also selected for grain size distribution and TOC analyses. The samples for grain size distribution were submitted to Tuscaloosa Testing Laboratory in Decatur, Alabama. The TOC samples were submitted to Severn Trent Laboratories, Inc. (STL) in University Park, Illinois.

Figure 3-3 shows the soil boring locations. Table 3-3 presents a summary of soil borings and a listing of soil samples collected for laboratory testing. A copy of the boring logs is provided in Appendix B.

3.2.2.1 D1 Area – Former HF Tar Neutralization Pit

Background - From approximately 1960 to 1963, hydrofluoric acid (HF) tars were collected at the site and disposed off-site at the 3M Woodbury Site. When disposal of the waste tars was discontinued at the Woodbury Site, they were disposed on-site in the designated D1 Area – Former HF Neutralization Pit. As shown in Figure 3-3, the D1 Area is located in the southeastern corner of the 3M property. It has been filled and covered. Information collected during previous assessments indicates that the D1 Area was constructed as a concrete basin or pit and the basin or pit was used to neutralize HF tars with lime. The historic information indicates that tars were taken to the pit in drums and then the drum contents were dumped into the pit. Lime was placed into the pit first, followed by the waste tar, then followed by more lime. A clamshell was used to mix the lime with the waste materials. It is believed that the D1 Area was operated from the mid 1960s to the early 1970s when it was closed and covered with local soils.

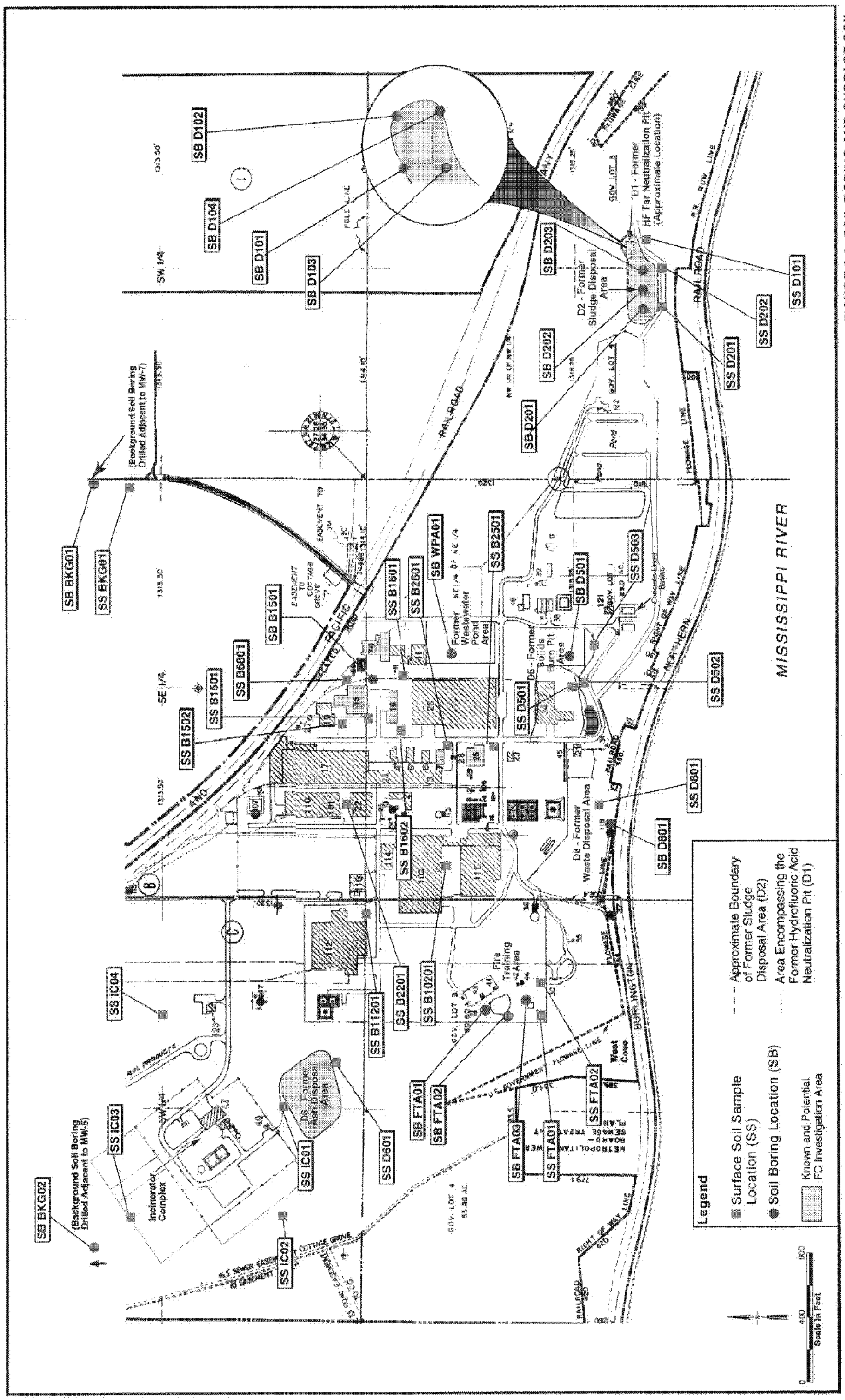


FIGURE 3-3 SOIL BORING AND SURFACE SOIL SAMPLE LOCATIONS – MAY 2005 3M COTTAGE GROVE, MN FACILITY

3MA01551820

Table 3-3 Summary of Soil Borings and Soil Samples
3M Cottage Grove, MN Facility

Soil Boring Location	Area of Assessment	Total Depth of Boring (ft bgs)	Sample ID	Sample Depth (ft bgs)
D101	Former HF Tar Neutralization Pit	25	CGMN SBC D101 0 0000	0-5
			CGMN SBC D101 0 0050	5-10
			CGMN SBC D101 0 0100	10-15
			CGMN SBC D101 DB 0100	10-15 (duplicate)
			CGMN SBC D101 0 0150	15-20
			CGMN SBC D101 0 0200*	20-25
D102	Former HF Tar Neutralization Pit	25	CGMN SBC D102 0 0000	0-5
			CGMN SBC D102 0 0050	5-10
			CGMN SBC D102 0 0100	10-15
			CGMN SBC D102 0 0150	15-20
			CGMN SBC D102 0 0200	20-25
D103	Former HF Tar Neutralization Pit	70	CGMN SBC D103 0 0000	0-5
			CGMN SBC D103 0 0050	5-10
			CGMN SBC D103 0 0100	10-15
			CGMN SBC D103 0 0150	15-20
			CGMN SBC D103 DB 0150	15-20 (duplicate)
			CGMN SBC D103 0 0200	20-25
			CGMN SBC D103 0 0250	25-30
			CGMN SBC D103 0 0300	30-35
			CGMN SBC D103 0 0350*	35-40
			CGMN SBC D103 0 0400	40-45
			CGMN SBC D103 0 0450	45-50
			CGMN SBC D103 0 0500*	50-55
			CGMN SBC D103 0 0550	55-60
			CGMN SBC D103 0 0600	60-65
			CGMN SBC D103 0 0650	65-70

Soil Boring Location	Area of Assessment	Total Depth of Boring (ft bgs)	Sample ID	Sample Depth (ft bgs)
D104	Former HF Tar Neutralization Pit	70	CGMN SBC D104 0 0000	0-5
			CGMN SBC D104 0 0050	5-10
			CGMN SBC D104 DB 0050	5-10 (duplicate)
			CGMN SBC D104 0 0100*	10-15
			CGMN SBC D104 0 0150	15-20
			CGMN SBC D104 0 0200	20-25
			CGMN SBC D104 0 0250	25-30
			CGMN SBC D104 0 0300	30-35
			CGMN SBC D104 0 0350	35-40
			CGMN SBC D104 0 0400	40-45
			CGMN SBC D104 0 0450*	45-50
			CGMN SBC D104 DB 0450	45-50 (duplicate)
			CGMN SBC D104 0 0500	50-55
			CGMN SBC D104 0 0550	55-60
			CGMN SBC D104 0 0600	60-65
			CGMN SBC D104 0 0650	65-70
D201	Former Sludge Disposal Area	45	CGMN SBC D201 0 0000	0-5
			CGMN SBC D201 0 0050	5-10
			CGMN SBC D201 0 0100	10-15
			CGMN SBC D201 DB 0100	10-15 (duplicate)
			CGMN SBC D201 0 0150	15-20
			CGMN SBC D201 0 0200*	20-25
			CGMN SBC D201 0 0250	25-30
			CGMN SBC D201 0 0300	30-35
			CGMN SBC D201 0 0350	35-40
			CGMN SBC D201 0 0400	40-45
D202	Former Sludge Disposal Area	50	CGMN SBC D202 0 0000	0-5
			CGMN SBC D202 0 0050	5-10
			CGMN SBC D202 0 0100	10-15
			CGMN SBC D202 0 0150	15-20
			CGMN SBC D202 0 0200	20-25
			CGMN SBC D202 0 0250	25-30
			CGMN SBC D202 0 0300	30-35
			CGMN SBC D202 0 0350	35-40
			CGMN SBC D202 DB 0350	35-40 (duplicate)
			CGMN SBC D202 0 0400	40-45
			CGMN SBC D202 0 0450	45-50

Soil Boring Location	Area of Assessment	Total Depth of Boring (ft bgs)	Sample ID	Sample Depth (ft bgs)
D203	Former Sludge Disposal Area	50	CGMN SBC D203 0 0000 CGMN SBC D203 0 0050 CGMN SBC D203 0 0100 CGMN SBC D203 0 0150 CGMN SBC D203 0 0200 CGMN SBC D203 0 0250 CGMN SBC D203 0 0300 CGMN SBC D203 DB 0300 CGMN SBC D203 0 0350 CGMN SBC D203 0 0400 CGMN SBC D203 0 0450	0-5 5-10 10-15 15-20 20-25 25-30 30-35 30-35 (duplicate) 35-40 40-45 45-50
FTA01	Fire Training Area	25	CGMN SBC FTA01 0 0000 CGMN SBC FTA01 0 0050 CGMN SBC FTA01 0 0100 CGMN SBC FTA01 0 0150 CGMN SBC FTA01 0 0200	0-5 5-10 10-15 15-20 20-25
FTA02	Fire Training Area	25	CGMN SBC FTA02 0 0000 CGMN SBC FTA02 0 0050 CGMN SBC FTA02 0 0100 CGMN SBC FTA02 DB 0100 CGMN SBC FTA02 0 0150* CGMN SBC FTA02 0 0200	0-5 5-10 10-15 10-15 (duplicate) 15-20 20-25
FTA03	Fire Training Area	25	CGMN SBC FTA03 0 0000 CGMN SBC FTA03 0 0050 CGMN SBC FTA03 0 0100 CGMN SBC FTA03 0 0150 CGMN SBC FTA03 0 0200	0-5 5-10 10-15 15-20 20-25
WPA01	Former Wastewater Pond Area	25	CGMN SBC WPA01 0 0000 CGMN SBC WPA01 0 0050 CGMN SBC WPA01 0 0100 CGMN SBC WPA01 DB 0100 CGMN SBC WPA01 0 0150* CGMN SBC WPA01 0 0200	0-5 5-10 10-15 10-15 (duplicate) 15-20 20-25
B1501	Building 15 Area	25	CGMN SBC B1501 0 0000 CGMN SBC B1501 0 0050 CGMN SBC B1501 0 0100 CGMN SBC B1501 0 0150 CGMN SBC B1501 0 0200	0-5 5-10 10-15 15-20 20-25

Soil Boring Location	Area of Assessment	Total Depth of Boring (ft bgs)	Sample ID	Sample Depth (ft bgs)
D501	Former Solids Burn Pit (D5)	25	CGMN SBC D501 0 0000 CGMN SBC D501 0 0050 CGMN SBC D501 0 0100 CGMN SBC D501 0 0150* CGMN SBC D501 0 0200	0-5 5-10 10-15 15-20 20-25
D801	Former Waste Disposal Area (D8)	25	CGMN SBC D801 0 0000 CGMN SBC D801 0 0050* CGMN SBC D801 0 0100 CGMN SBC D801 0 0150 CGMN SBC D801 0 0200	0-5 5-10 10-15 15-20 20-25
BKG01	Background near MW-7	25	CGMN SBC BKG01 0 0000* CGMN SBC BKG01 0 0050 CGMN SBC BKG01 0 0100 CGMN SBC BKG01 DB 0100 CGMN SBC BKG01 0 0150 CGMN SBC BKG01 0 0200	0-5 5-10 10-15 10-15 (duplicate) 15-20 20-25
BKG02	Background near MW-5	25	CGMN SBC BKG02 0 0000 CGMN SBC BKG02 0 0050 CGMN SBC BKG02 0 0100 CGMN SBC BKG02 DB 0100 CGMN SBC BKG02 0 0150 CGMN SBC BKG02 0 0200	0-5 5-10 10-15 10-15 (duplicate) 15-20 20-25

ft bgs – feet below ground surface
* Sample submitted for grain size and total organic carbon (TOC) analyses.

Soil Boring Installation and Sampling - Four soil borings (D101, D102, D103, and D104) were advanced in the area of the Former HF Tar Neutralization Pit as shown in Figure 3-3. Soil borings D101 and D102 were advanced to a depth of 25 feet below ground surface (ft bgs). Soil borings D103 and D104, located on the south (presumed downgradient) side of the former pit, were advanced to a depth of 70 ft bgs.

3.2.2.2 D2 Area – Former Sludge Disposal Area

Background - After replacement of the original wastewater treatment pond and construction of new wastewater treatment ponds in the early 1960s, sludge disposal occurred in the designated D2 – Former Sludge Disposal Area. As shown in Figure 3-3, the D2 Area is located to the west of and adjacent to the D1 Area. Historic information indicated that sludge or dredgings were removed from a pond after they were allowed to dry out and then disposed in the D2 Area. This site was closed and covered sometime between 1973 and 1975. Visual inspection of the site indicates that it is a man-made topographically high area approximately 4 acres in size.

Soil Boring Installation and Sampling - Three soil borings (D201, D202, and D203) were advanced within the footprint of the D2 – Former Sludge Disposal Area to assess the sludge thickness and the underlying native soil. The soil borings were advanced to depths of 44 ft bgs (D201), 50 ft bgs (D202), and 50 ft bgs (D203).

3.2.2.3 D5 – Former Solids Burn Pit

Background - The designated D5 Area – Former Solids Burn Pit Area was located to the southeast of Building 34 and directly west of the current wastewater treatment operations. Building 34 has since been demolished and removed and the D5 Area has been covered with 3 to 7 feet of fill. Historic information indicated that this area was used for burning organic solid wastes and disposal of inorganic solid wastes generated from plant production operations. Skimmings of sludge from the original wastewater pond were reportedly placed in this area. Burning of the solids was fueled by limited additions of waste solvents. There are now no visual ground surface indications of the boundaries of this site.

Soil Boring Installation and Sampling - A soil boring (D501) was advanced to a depth of 25 ft bgs in the area formerly used to burn solid wastes, which were generated on-site. The area is currently covered with gravel and used for parking tractor trailers. The soil boring was located within the presumed D5 area based on historic photographs and maps for the facility.

3.2.2.4 D8 – Former Waste Disposal Area

Background - This is a former construction debris and damaged container disposal area is located immediately north of the pumphouse for PW-6 in a steep ravine. An Interim Remedial Measure (IRM) was conducted with MPCA approval at the D8 Area during November 1985. Approximately 200 damaged containers and container fragments were removed and disposed off-site. Due to the extreme steep slopes at the D8 Area and the low level of organics encountered, the MPCA and 3M agreed that some of the inaccessible containers could be covered and left in place. Surface management activities were conducted as part of the IRM. These included brush clearing and construction of access roadways prior to excavation, covering with soil, regrading, and seeding after excavation. The area is now completely revegetated.

Soil Boring Installation and Sampling - Soil boring D801 was advanced immediately downgradient of the D8 - Former Waste Disposal Area to a depth of 25 ft bgs. Access to this area is very restricted due to the steep terrain and the boring was located at the base of the slope in the ravine downgradient of the D-8 Area.

3.2.2.5 Fire Training Area

Background - As shown in Figure 3-3, the Fire Training Area is located on the western portion of plant operations. The area was utilized as early as 1968 to test fire fighting foams. The fire fighting foams are proprietary 3M products that contain FCs.

Various structures were used for training and waste containment in this area. Originally, shallow pans were used for setting fires. In 1970, an underground storage tank (UST) replica was constructed for training to contain fires at UST sites. Based on historic information, prior to 1971, much of the residuals and liquids from the firefighting exercises discharged to area drainages and then to the drainageway located west of this area. In 1972, a UST was constructed to collect fluids and wastes from the pans. The tank contents were removed quarterly and hauled to the on-site wastewater treatment plant.

In 1981, 3M constructed a lined pond in the Fire Training Area to collect fluids from the fire fighting activities. Accumulated fluids would be pumped into a tanker truck and discharged to the on-site wastewater treatment plant.

Soil Boring Installation and Sampling - Three borings (FTA01, FTA02, and FTA03) were advanced in the vicinity of the Fire Training Area on the southwest portion of the facility. Due to the presence of a newly-constructed containment pond, the soil boring locations were adjusted from those indicated in the FC Work Plan. The adjusted locations provided the same areal coverage. All three borings were advanced to a depth of 25 ft bgs.

3.2.2.6 Building 15 Area

Background - Building 15 is the location of electrochemical fluorination (ECF) cells used in FC production.

Soil Boring Installation and Sampling - One soil boring (B1501) was advanced southeast of Building 15 in the plant area to evaluate potential impact to the soil from past FC management in this area. The location was selected downgradient of the building as shown in Figure 3-3. The soil boring was advanced to a depth of 25 ft bgs.

3.2.2.7 Former Wastewater Pond Area

Background - Wastewater treatment has occurred at the facility since operations began in 1947. The original wastewater pond was located in the area east of Building 26 and south of Building 41 and was operated until construction of the present day wastewater treatment system in the early 1960s. Skimmings of sludge from the original pond were reportedly disposed on-site in the designated D5 – Former Solids Burn Pit Area.

Soil Boring Installation and Sampling - One soil boring (WPA01) was advanced to a depth of 25 ft bgs within an asphalt parking area east of Building 26 and south of Building 41 at the site of the original wastewater treatment pond. This was confirmed through the review of historic photographs of the facility.

3.2.2.8 Background Areas

Soil Boring Installation and Sampling - Two soil borings were advanced in areas having no history of plant activity north of the facility to serve as background control points. The borings were advanced adjacent to monitoring wells MW-7 (soil boring BKG01) and MW-5 (soil boring BKG02).

3.2.3 Description of Surface Soil Sampling

In May 2005, 50 soil samples were collected at 25 locations (0 to 6" and 6 to 24" bgs at each location) across the site. These locations were concentrated in known or potential areas where FCs were handled but also were distributed at a lesser frequency over general active plant areas and background locations to provide a plant-wide understanding of the occurrence of FCs in surface soils. Surface soil samples were field-located based on the following criteria:

- Sample locations were biased toward areas that did not show any evidence of recent disturbance, filling, or grading.
- Sample locations were biased toward areas of most likely impact from past activities at the site, such as areas immediately adjacent to disposal locations or within drainage swales downgradient of former potential FC management areas.

Historic photographs and aerial photographs also were used to position surface sample locations appropriately.

Two samples were collected from each surface soil sampling location. The first sample was collected from surface grade to a depth of approximately six inches. In areas of gravel or asphalt, the sample was collected immediately below the gravel layer. Soil from six to 24 inches in depth was collected using stainless steel bucket augers. For each sampling interval, soil was placed into a clean stainless steel bowl for homogenization.

Once blended, the soil was placed into precleaned containers provided by the laboratory. The containers were promptly sealed, labeled, and placed into ice chests cooled to approximately 4 °C. The sample information was entered onto a COC that accompanied the samples to the laboratory. In accordance with the FC Work Plan, duplicate media samples and rinsate blank samples were also collected as part of the sampling protocol. Table 3-4 presents a summary of the surface soil sampling activities.

3.3 DESCRIPTION OF THE SEDIMENT AND SURFACE WATER ASSESSMENT

In accordance with the FC Work Plan and MPCA-requested Work Plan modifications, WESTON conducted sediment and surface water sampling at the east and west coves and the Mississippi River during the week of August 8, 2005.

3.3.1 East and West Coves

On August 10, 2005, WESTON collected six sediment and two surface water samples from the east and west coves. The sampling locations (EC-1 through EC-3 at the east cove and WC-1 through WC-3 at the west cove) are shown in Figure 3-4.

On August 12, 2005, in accordance with the FC Work Plan, WESTON collected a sediment and a surface water sample at a location (EU-1) in the upstream drainageway to the east cove and a sediment sample at a location (WU-1) in the upstream drainageway to the west cove. A surface water sample could not be collected in the west cove drainageway since there was no water present. The upstream cove sampling locations are shown in Figure 3-4.

At each of the three sampling locations in the east and west coves, a sediment sample was collected from the 0 -10 cm and 10 – 20 cm depth intervals using a polycarbonate tube sampler. In the upstream drainageways, the sediment sample was collected from the 0 – 10 cm depth interval. Sediment samples were homogenized in metal trays with disposable polyethylene liners and placed into pre-cleaned laboratory-supplied bottles, sealed and labeled.

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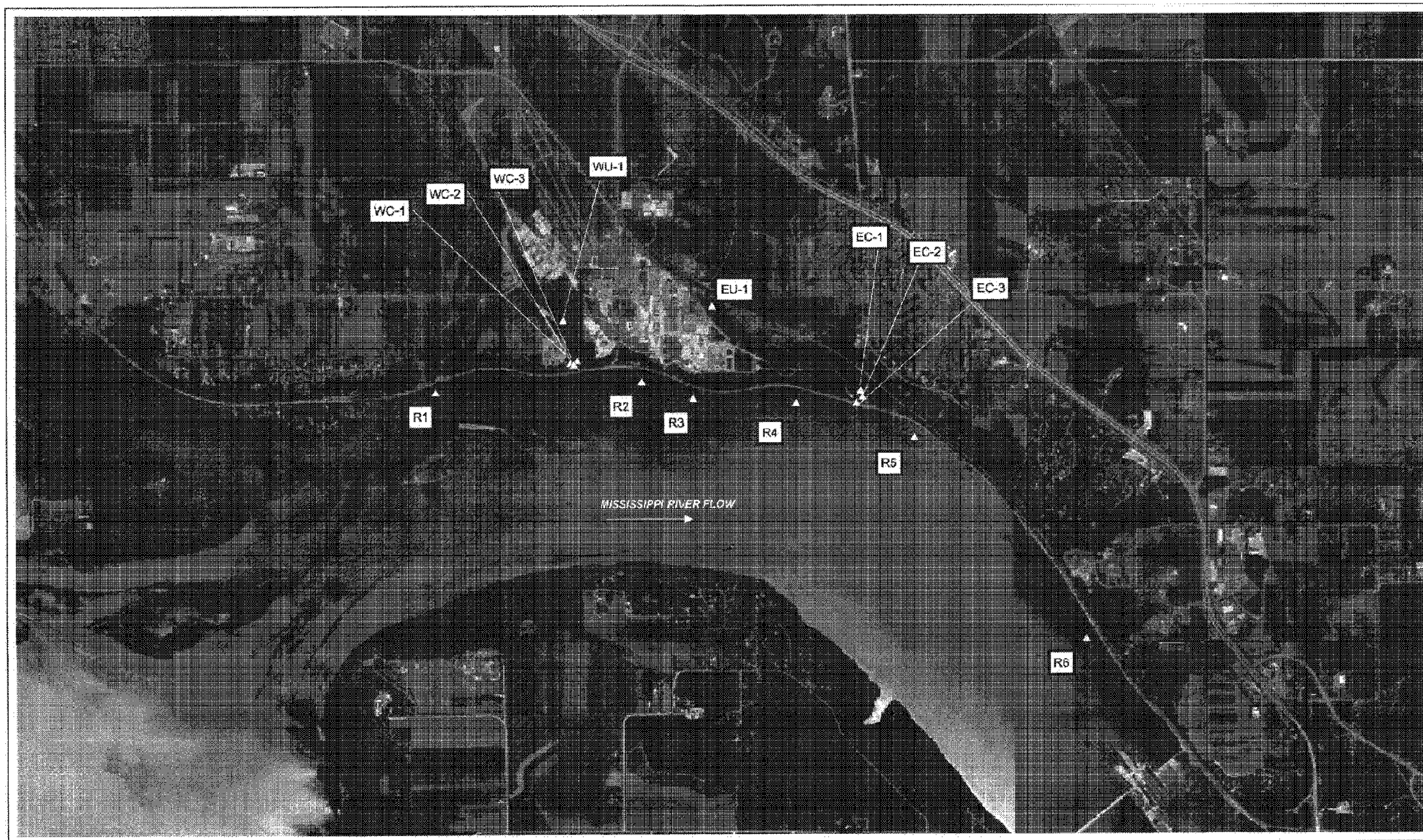
Table 3-4 Summary of Surface Soil Samples
3M Cottage Grove, MN Facility

Area	Site Description	Sample ID	Sample Depth (in bgs)	Sample Description
D1	Former HF Tar Neutralization Pit	CGMN SS D101 0 0000	0-6	Black silty sand
		CGMN SS D101 0 0005	6-24	Black silty sand
		CGMN SS D101 DB 0005	6-24	Duplicate
D2	Former Sludge Disposal Area	CGMN SS D201 0 0000	0-6	Silty sand with black organics
		CGMN SS D201 0 0005	6-24	Silty sand with black organics
		CGMN SS D202 0 0000	0-6	Black silty sand
		CGMN SS D202 0 0005	6-24	Dk brown silty sand
D5	Former Solids Burn Pit Area	CGMN SS D501 0 0000	0-6	Black silty sand
		CGMN SS D501 0 0005	6-24	Dk brown silty sand with green layer (unknown)
		CGMN SS D502 0 0000	0-6	Black silty sand
		CGMN SS D502 0 0005	6-24	Brown silty sand
		CGMN SS D503 0 0000	0-6	Black sand
		CGMN SS D503 0 0005	6-24	Brown sand
D6	Former Ash Disposal Area	CGMN SS D601 0 0000	0-6	Black silty sand
		CGMN SS D601 0 0005	6-24	Black silty sand
		CGMN SS D601 DB 0005	6-24	Duplicate
D8	Former Waste Disposal Area	CGMN SS D801 0 0000	0-6	Black gravelly sand
		CGMN SS D801 0 0005	6-24	Gravelly sand
FTA	Fire Training Area	CGMN SS FTA01 0 0000	0-6	Black silty sand
		CGMN SS FTA01 0 0005	6-24	Brown clayey silty sand
		CGMN SS FTA01 DB 0005	6-24	Duplicate
		CGMN SS FTA02 0 0000	0-6	Black silty sand
		CGMN SS FTA02 0 0005	6-24	Brown silty sand
IC	Incinerator Complex – IC01 southeast of complex	CGMN SS IC01 0 0000	0-6	Brown sandy gravel
	IC01 southeast of complex	CGMN SS IC01 0 0005	6-24	Dark brown gravelly sand
	IC02 southwest of complex	CGMN SS IC02 0 0000	0-6	Black sandy gravel
		CGMN SS IC02 0 0005	6-24	Dark brown sandy gravel
	IC03 northwest of complex	CGMN SS IC03 0 0000	0-6	Brown sandy gravel
		CGMN SS IC03 0 0005	6-24	Reddish brown gravelly sand
	IC04 northeast of complex	CGMN SS IC04 0 0000	0-6	Black silty sand
		CGMN SS IC04 0 0005	6-24	Black silty sand
General Plant Area	Building 15	CGMN SS B1501 0 0000	0-6	Dark brown silty sand
		CGMN SS B1501 0 0005	6-24	Black silty sand
		CGMN SS B1502 0 0000	0-6	Dark brown silty sand
		CGMN SS B1502 0 0005	6-24	Black silty sand
	Building 16	CGMN SS B1601 0 0000	0-6	Dark brown silty sand
		CGMN SS B1601 0 0005	6-24	Black silty sand
		CGMN SS B1602 0 0000	0-6	Dark brown silty sand
		CGMN SS B1602 0 0005	6-24	Black silty sand
	Building 22	CGMN SS B2201 0 0000	0-6	Brown sandy gravel
		CGMN SS B2201 0 0005	6-24	Brown sandy gravel to silty sand
		CGMN SS B2201 DB 0005	6-24	Duplicate

Area	Site Description	Sample ID	Sample Depth (in bgs)	Sample Description
General Plant Area	Building 25	CGMN SS B2501 0 0000	0-6	Brown sandy gravel
		CGMN SS B2501 0 0005	6-24	Brown gravelly sand
	Building 26/ Building 7	CGMN SS B2601 0 0000	0-6	Brown sandy gravel
		CGMN SS B2601 0 0005	6-24	Brown gravelly sand
	Building 68	CGMN SS B6801 0 0000	0-6	Brown sandy gravel
		CGMN SS B6801 DB 0000	0-6	Duplicate
		CGMN SS B6801 0 0005	6-24	Black silty sand
	Building 102	CGMN SS B10201 0 0000	0-6	Black silty sand
		CGMN SS B10201 0 0005	6-24	Dark brown silty sand
	Building 112	CGMN SS B11201 0 0000	0-6	Black silty sand
		CGMN SS B11201 0 0005	6-24	Black silty sand
BKG	Background Sample-Northeast	CGMN SS BKG01 0 0000	0-6	Black silty sand
		CGMN SS BKG01 0 0005	6-24	Black silty sand

in bgs – Inches below ground surface



Legend:

△ Surface Water/Sediment Sampling Location

Map Source:
U.S. Department of Agriculture, Farm Services Agency, Aerial Photography Field Office;
National Agricultural Imagery Program (NAIP) Digital Orthorectified Images (DOQ), Minnesota, 2003

WESTON

FIGURE 3-4
SEDIMENT AND SURFACE WATER
SAMPLE LOCATIONS- AUGUST 2005

3M COTTAGE GROVE, MN FACILITY

One surface water sample was collected at each cove and co-located with a sediment sample (locations EC-1 and WC-1). The water depth at both of the locations was less than 10 feet in depth. Therefore, in accordance with the Work Plan, each surface water sample was collected into a polyvinyl chloride (PVC) niskin bottle in the coves at approximately 0.6 the total water depth. The surface water sample from the east cove upstream drainageway was collected into a pre-cleaned unspiked sample bottle. Aliquots of the water samples were transferred into appropriate spiked laboratory-supplied bottles, sealed and labeled. A YSI meter was used to measure and record the following surface water sample parameters in the field: temperature, conductivity, dissolved oxygen (DO), pH, oxidation-reduction potential (ORP), and turbidity. A hand-held Global Positioning System (GPS) unit was used to record positional data.

The sediment and surface water samples were placed into ice chests cooled to approximately 4°C. Sample information was entered onto a COC that accompanied the samples to the laboratory. The samples were submitted to Exygen Research Laboratory in State College, Pennsylvania for FC analyses.

3.3.2 Mississippi River

On August 9, 2005, WESTON launched a boat into the Mississippi River to collect sediment and surface water samples in accordance with the FC Work Plan. Also, one additional downstream location to those presented in the FC Work Plan was sampled. The sampling locations (R1 through R6) are shown in Figure 3-4.

At each sampling location in the Mississippi River, a sediment sample was collected from the top 10 cm of sediment using a ponar sampler. The sample was homogenized in metal trays with disposable plastic liners and placed into pre-cleaned laboratory-supplied bottles and labeled.

For the collection of surface water samples, the depth of water at each location was measured using a depth finder. At locations R2, R3, R4, R5, EC-1 and WC-1 the water depth was less than 10 feet in depth. Therefore, in accordance with the Work Plan, each surface water sample was collected into a PVC niskin bottle at approximately 0.6 the total water depth. At locations R1 and R6 the water depth was greater than 10 feet. Therefore, in accordance with the Work Plan, the water sample at these locations was composited from discrete samples collected at approximately 0.2 and 0.8 the total water depth. Aliquots of each water sample were transferred into appropriate spiked laboratory-supplied bottles, sealed and labeled. A YSI meter was used to measure and record the following surface water sample parameters in the field: temperature, conductivity, DO, pH, ORP, and turbidity. Buoy markers were placed at the sampling locations, and a hand-held GPS unit was later used to record positional data.

3.4 DESCRIPTION OF THE MISSISSIPPI RIVER FISH SAMPLING PROGRAM

Collections of fish were performed in the Mississippi River in the vicinity of Cottage Grove, Minnesota under the scientific collection permit (SCP) Special Permit No. 13031 issued by the Minnesota Department of Natural Resources Fish Management Section of the Division of Fish and Wildlife. Prior to the collection effort, the Area Fisheries Manager and the Regional Fisheries Manager were notified of the pending sampling activities. No threatened or endangered species were encountered and all collections were performed in accordance with the SCP conditions. A collection activities report was submitted to MDNR on January 30, 2006 in accordance with the requirements of the SCP. A copy of this report is provided in Appendix C.

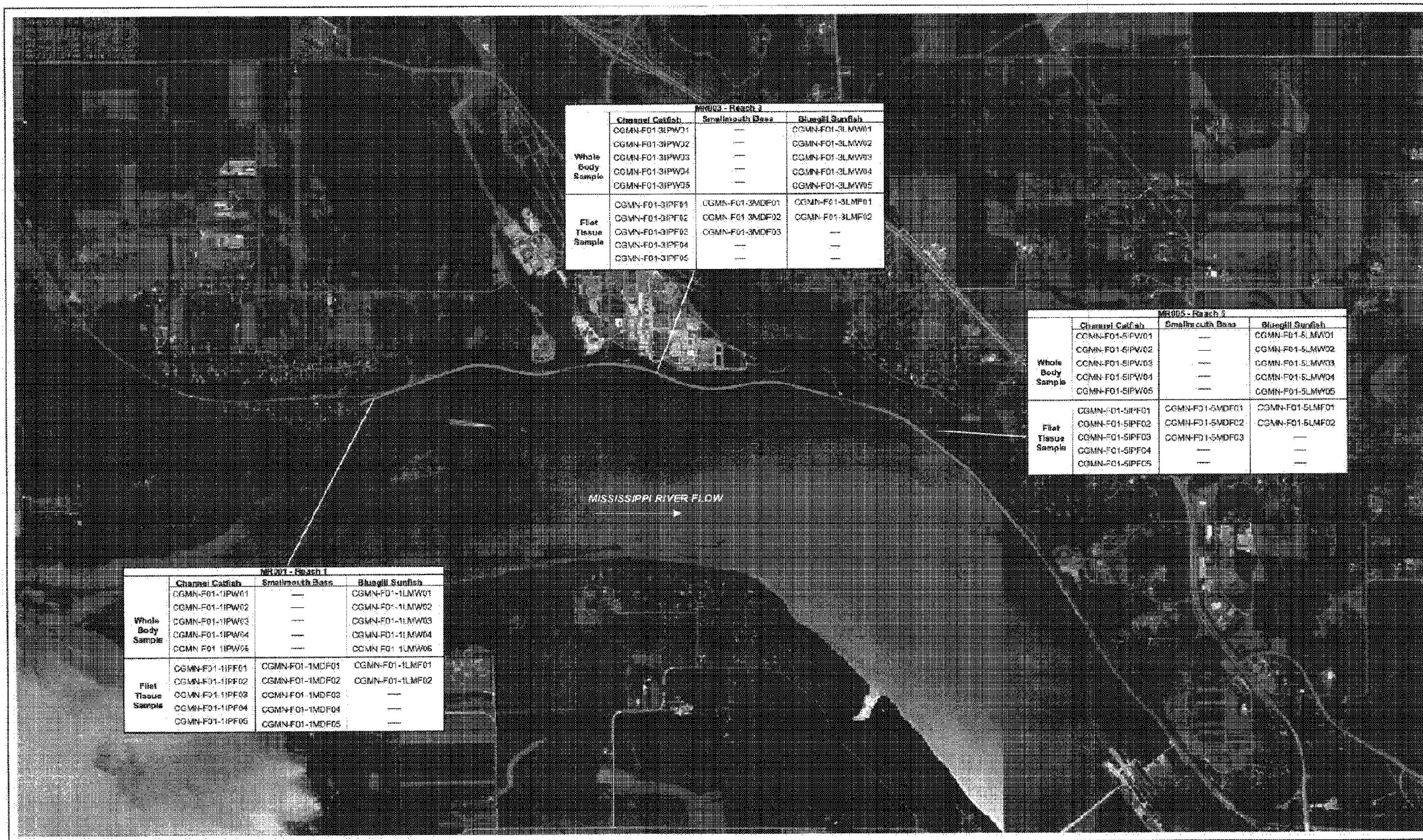
Fish collections were performed between August 8, 2005 and August 12, 2005 at three reaches near the 3M Cottage Grove facility. Specimens were collected of smallmouth bass (*Micropterus dolomieu*), channel catfish (*Ictalurus punctatus*) and bluegill sunfish (*Lepomis macrochirus*). While sufficient channel catfish specimens were captured to meet the numeric targets of the FC Work Plan, smallmouth bass were not as abundant and those captured were used for filet tissue samples. Bluegill sunfish were more abundant than smallmouth bass in the reaches sampled and were collected to augment the smallmouth bass samples. Bluegill sunfish were used in lieu of smallmouth bass for the whole body samples from all three sampling reaches. While the target of 5 smallmouth bass samples were collected for filet tissue analyses from the upstream reach (Reach 1), only three smallmouth bass filet samples were collected from the other two sampling reaches. As a result, two bluegill sunfish filet samples were collected from each of the three sampling reaches to allow for comparisons of analytical results.

Sample collection gear included electrofishing for smallmouth bass and bluegill sunfish and trotlining for catfish. Non-target species were released. A total of 62 fish were collected including 11 smallmouth bass, 30 channel catfish and 21 bluegill sunfish. Whole body or filet tissue samples were prepared from the collected specimens for chemical analyses, preserved by freezing with dry ice, and shipped to the Exygen Research in State College, Pennsylvania for FC analyses. Sample identification codes are of the form CGMN-F01-xxxxxx-050812 with the following conventions for location, species and sample type in the –xxxxxx- string:

- First character indicates the sampling reach (1, 3 or 5).
- Second and third characters indicate the species where IP = channel catfish, MD = smallmouth bass and LM = bluegill sunfish.
- Fourth character indicates the sample type where F = filet tissue and W = whole body tissue.
- Last character(s) indicate either sample number within a location, species and sample type (01 – 05) or a composite sample (C).

For example, the sample designated CGMN-F01-3IPW04-0-050812 is the fourth channel catfish whole body tissue sample from Reach 3 and CGMN-F01-5MDFC-0-050812 is the Reach 5 smallmouth bass filet tissue composite sample.

Figure 3-5 shows the collection locations and the sample IDs. Tabulated morphometric data on the fish whole body and filet tissue samples are provided in Tables 3-5 and 3-6, respectively.



MR001 - Reach 1	Channel Catfish	Smallmouth Bass	Bluegill Sunfish
Whole Body Sample	CGMN-F01-1IPW01	—	CGMN-F01-1LMW01
	CGMN-F01-1IPW02	—	CGMN-F01-1LMW02
	CGMN-F01-1IPW03	—	CGMN-F01-1LMW03
	CGMN-F01-1IPW04	—	CGMN-F01-1LMW04
	CGMN-F01-1IPW05	—	CGMN-F01-1LMW06
Filet Tissue Sample	CGMN-F01-1IPF01	CGMN-F01-1MDF01	CGMN-F01-1LMF01
	CGMN-F01-1IPF02	CGMN-F01-1MDF02	CGMN-F01-1LMF02
	CGMN-F01-1IPF03	CGMN-F01-1MDF03	—
	CGMN-F01-1IPF04	CGMN-F01-1MDF04	—
	CGMN-F01-1IPF05	CGMN-F01-1MDF05	—

MR003 - Reach 3	Channel Catfish	Smallmouth Bass	Bluegill Sunfish
Whole Body Sample	CGMN-F01-3IPW01	—	CGMN-F01-3LMW01
	CGMN-F01-3IPW02	—	CGMN-F01-3LMW02
	CGMN-F01-3IPW03	—	CGMN-F01-3LMW03
	CGMN-F01-3IPW04	—	CGMN-F01-3LMW04
	CGMN-F01-3IPW05	—	CGMN-F01-3LMW05
Filet Tissue Sample	CGMN-F01-3IPF01	CGMN-F01-3MDF01	CGMN-F01-3LMF01
	CGMN-F01-3IPF02	CGMN-F01-3MDF02	CGMN-F01-3LMF02
	CGMN-F01-3IPF03	CGMN-F01-3MDF03	—
	CGMN-F01-3IPF04	—	—
	CGMN-F01-3IPF05	—	—

MR005 - Reach 5	Channel Catfish	Smallmouth Bass	Bluegill Sunfish
Whole Body Sample	CGMN-F01-5IPW01	—	CGMN-F01-5LMW01
	CGMN-F01-5IPW02	—	CGMN-F01-5LMW02
	CGMN-F01-5IPW03	—	CGMN-F01-5LMW03
	CGMN-F01-5IPW04	—	CGMN-F01-5LMW04
	CGMN-F01-5IPW05	—	CGMN-F01-5LMW05
Filet Tissue Sample	CGMN-F01-5IPF01	CGMN-F01-5MDF01	CGMN-F01-5LMF01
	CGMN-F01-5IPF02	CGMN-F01-5MDF02	CGMN-F01-5LMF02
	CGMN-F01-5IPF03	CGMN-F01-5MDF03	—
	CGMN-F01-5IPF04	—	—
	CGMN-F01-5IPF05	—	—

FIGURE 3-5
FISH SAMPLES - AUGUST 2005

3M COTTAGE GROVE, MN FACILITY

T:\Cottage_Grove\mxds\Aug2005_fish_samples.mxd 3/14/2006 @ 1:03:39 PM

Table 3-5
Fish Whole Body Tissue Samples

Reach 1 - Whole Body Samples				
Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)
CGMN-F01-1IPW01-0-050812	Channel catfish	195	174	54
CGMN-F01-1IPW02-0-050812	Channel catfish	343	295	265
CGMN-F01-1IPW03-0-050812	Channel catfish	445	375	600
CGMN-F01-1IPW04-0-050812	Channel catfish	443	395	596
CGMN-F01-1IPW05-0-050812	Channel catfish	550	485	1617
CGMN-F01-1LMW01-0-050812	Bluegill sunfish	124	120	44
CGMN-F01-1LMW02-0-050812	Bluegill sunfish	135	129	50
CGMN-F01-1LMW03-0-050812	Bluegill sunfish	120	112	37
CGMN-F01-1LMW04-0-050812	Bluegill sunfish	129	120	44
CGMN-F01-1LMW05-0-050812	Bluegill sunfish	120	113	32
Reach 3 - Whole Body Samples				
Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)
CGMN-F01-3IPW01-0-050812	Channel catfish	222	191	74
CGMN-F01-3IPW02-0-050812	Channel catfish	335	278	252
CGMN-F01-3IPW03-0-050812	Channel catfish	330	279	250
CGMN-F01-3IPW04-0-050812	Channel catfish	505	439	979
CGMN-F01-3IPW05-0-050812	Channel catfish	552	491	1630
CGMN-F01-3LMW01-0-050812	Bluegill sunfish	142	134	64
CGMN-F01-3LMW02-0-050812	Bluegill sunfish	128	121	46
CGMN-F01-3LMW03-0-050812	Bluegill sunfish	140	133	62
CGMN-F01-3LMW04-0-050812	Bluegill sunfish	132	125	57
CGMN-F01-3LMW05-0-050812	Bluegill sunfish	125	120	45
Reach 5 - Whole Body Samples				
Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)
CGMN-F01-5IPW01-0-050812	Channel catfish	562	512	1548
CGMN-F01-5IPW02-0-050812	Channel catfish	397	350	481
CGMN-F01-5IPW03-0-050812	Channel catfish	568	515	1643
CGMN-F01-5IPW04-0-050812	Channel catfish	552	491	1440
CGMN-F01-5IPW05-0-050812	Channel catfish	483	450	1100
CGMN-F01-5LMW01-0-050812	Bluegill sunfish	98	94	19
CGMN-F01-5LMW02-0-050812	Bluegill sunfish	122	118	40
CGMN-F01-5LMW03-0-050812	Bluegill sunfish	100	95	21
CGMN-F01-5LMW04-0-050812	Bluegill sunfish	114	109	34
CGMN-F01-5LMW05-0-050812	Bluegill sunfish	100	95	20

Table 3-6
Fish Filet Tissue Samples

Reach 1 - Filet Tissue Samples - Bass/Sunfish					
Sample ID	**Common Name**	**Total Length (mm)**	**Fork Length (mm)**	**Total Weight (g)**	**Sample Weight (g)**
CGMN-F01-1MDF01-0-050812	Smallmouth bass	387	367	692	137
CGMN-F01-1MDF02-0-050812	Smallmouth bass	320	300	454	97
CGMN-F01-1MDF03-0-050812	Smallmouth bass	231	220	178	36
CGMN-F01-1MDF04-0-050812	Smallmouth bass	228	215	162	39
CGMN-F01-1MDF05-0-050812	Smallmouth bass	230	220	166	34
CGMN-F01-1LMF01-0-050812	Bluegill sunfish	180	172	155	29
CGMN-F01-1LMF02-0-050812	Bluegill sunfish	155	148	92	19

Reach 3 - Filet Tissue Samples - Bass/Sunfish					
Sample ID	**Common Name**	**Total Length (mm)**	**Fork Length (mm)**	**Total Weight (g)**	**Sample Weight (g)**
CGMN-F01-3MDF01-0-050812	Smallmouth bass	160	156	63	26*
CGMN-F01-3MDF02-0-050812	Smallmouth bass	227	218	175	39
CGMN-F01-3MDF03-0-050812	Smallmouth bass	222	213	175	37
CGMN-F01-3LMF01-0-050812	Bluegill sunfish	145	138	65	24*
CGMN-F01-3LMF02-0-050812	Bluegill sunfish	150	140	75	31*

Reach 5 - Filet Tissue Samples - Bass/Sunfish					
Sample ID	**Common Name**	**Total Length (mm)**	**Fork Length (mm)**	**Total Weight (g)**	**Sample Weight (g)**
CGMN-F01-5MDF01-0-050812	Smallmouth bass	220	210	158	34
CGMN-F01-5MDF02-0-050812	Smallmouth bass	250	239	274	59
CGMN-F01-5MDF03-0-050812	Smallmouth bass	240	228	214	46
CGMN-F01-5LMF01-0-050812	Bluegill sunfish	140	135	72	29*
CGMN-F01-5LMF02-0-050812	Bluegill sunfish	139	131	69	29*

Reach 1 - Filet Tissue Samples - Channel Catfish					
Sample ID	**Common Name**	**Total Length (mm)**	**Fork Length (mm)**	**Total Weight (g)**	**Sample Weight (g)**
CGMN-F01-1IPF01-0-050812	Channel catfish	750	680	4500	861
CGMN-F01-1IPF02-0-050812	Channel catfish	700	630	2800	538
CGMN-F01-1IPF03-0-050812	Channel catfish	540	495	1750	285
CGMN-F01-1IPF04-0-050812	Channel catfish	660	600	2500	428
CGMN-F01-1IPF05-0-050812	Channel catfish	562	500	1750	357

* Both right and left side filets included in sample to provide adequate sample mass for analyses.

Table 3-6
Fish Filet Tissue Samples

Reach 3 - Filet Tissue Samples - Channel Catfish					
Sample ID#	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g)
CGMN-F01-3IPF01-0-050812	Channel catfish	625	570	2250	317
CGMN-F01-3IPF02-0-050812	Channel catfish	640	573	2500	479
CGMN-F01-3IPF03-0-050812	Channel catfish	700	645	3250	528
CGMN-F01-3IPF04-0-050812	Channel catfish	760	710	3500	540
CGMN-F01-3IPF05-0-050812	Channel catfish	640	580	3000	603

Reach 5 - Filet Tissue Samples - Channel Catfish					
Sample ID#	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g)
CGMN-F01-5IPF01-0-050812	Channel catfish	560	500	2000	392
CGMN-F01-5IPF02-0-050812	Channel catfish	670	600	2500	355
CGMN-F01-5IPF03-0-050812	Channel catfish	680	630	3250	646
CGMN-F01-5IPF04-0-050812	Channel catfish	672	630	3250	406
CGMN-F01-5IPF05-0-050812	Channel catfish	620	560	2000	319

4. RESULTS OF THE FIELD ASSESSMENT

4.1 SUMMARY OF THE ANALYTICAL DATA REDUCTION PROCESS

Analytical data for FCs have been reported in Interim Reports from the Exygen and the 3M laboratories. In instances where quality control (QC) data on spike or surrogate spike recoveries associated with a sample exceed the 70 to 120% range of acceptance for an accuracy of +/- 30%, QC data were reviewed and the accuracy assessed on a sample by sample basis (i.e. +/- 40 %, +/- 50%, or +/- 60%). For data outside an assessed accuracy of +/- 60% or where the endogenous concentrations of the analyte in a medium were over three times greater than the highest spike concentration, the data are not reported (NR). Additional analytical work, including method development, is in progress by 3M in an attempt to resolve these QC issues and provide quantitative results for these samples. Other data reported with non-numerical values include results that are assigned NQ (not quantified) because they are below the Limit of Quantitation (LOQ) and results that are assigned ND (not detected) because the analyte was not detected at or above the Limit of Detection (LOD).

In addition to each primary sample analysis, a replicate sample analysis was performed. In aqueous media, a field duplicate sample analysis was also performed in addition to the primary and replicate analyses for each sample. The primary, replicate and, where available, duplicate results were reduced to a single value in order to simplify reporting. The data reduction process consisted of calculating the average concentration (arithmetic mean) for sets comprised of numeric values. In instances with mixed numeric values and non-numeric values (ND or NQ), the numeric values were carried through to represent the media concentrations. For those limited sets composed of ND and NQ values, the NQ values were carried through to represent the media concentrations. It should be noted that the data reduction convention described above is conservative and may result in overestimation of actual concentrations.

4.2 GROUNDWATER

4.2.1 Groundwater Elevations

As summarized in Subsection 2.5, groundwater elevation data collected at the 3M Cottage Grove facility in March of 2005 (Figure 2-5) indicate a southerly groundwater gradient toward the Mississippi River from the 3M property. Pumping of the production wells influences water levels most significantly in the central part of the plant area and is reduced with increasing distances from this area.

The extent of pumping influence, as indicated by drawdown in monitoring wells, is represented on cross section B-B' (Figure 4-1). The cross section is drawn in an east-west direction along the Mississippi River (Figure 4-2). As indicated on Figure 4-1, a depression in the water table is apparent in the area of the pumping wells PW-5 and PW-6 and extends in an eastward direction to MW-16. Beyond MW-16 in an easterly direction, the drawdown influence due to pumping is not confirmed.

4.2.2 Summary of Analytical Data

The groundwater analytical data for the Cottage Grove facility wells are summarized in Table 4-1. Figures 4-2 and 4-3 depict PFOA and PFOS groundwater concentrations, respectively, adjacent to the wells in which they were detected. A copy of the groundwater analytical data package (without appendices) is provided in Appendix D.

It is important to note that, as approved by the MPCA, a copy of all of the analytical data packages (for samples collected under this data assessment program) have been provided in Appendix D without their appendices due to their large size and to facilitate paper reduction. The data packages including appendices are on file with WESTON and can be provided upon request.

Due to the QC issues as discussed in Section 4.1, the analytical results for PFBS, PFHS and PFOA are NR for the groundwater sample from well MW-19. Additional analytical work is being performed in an effort to provide quantitative analytical results for the MW-19 sample and, if successful, will be reported when available.

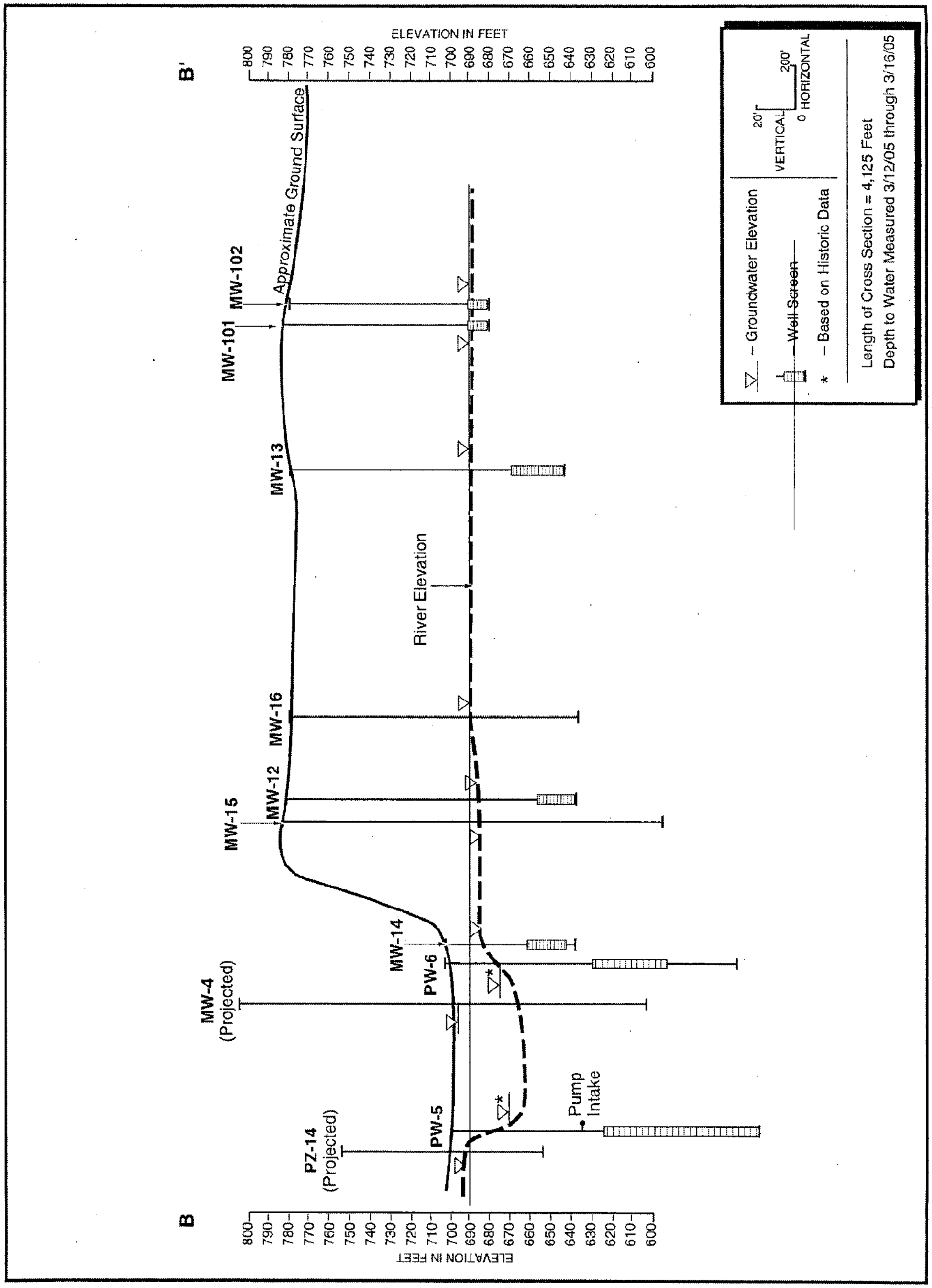
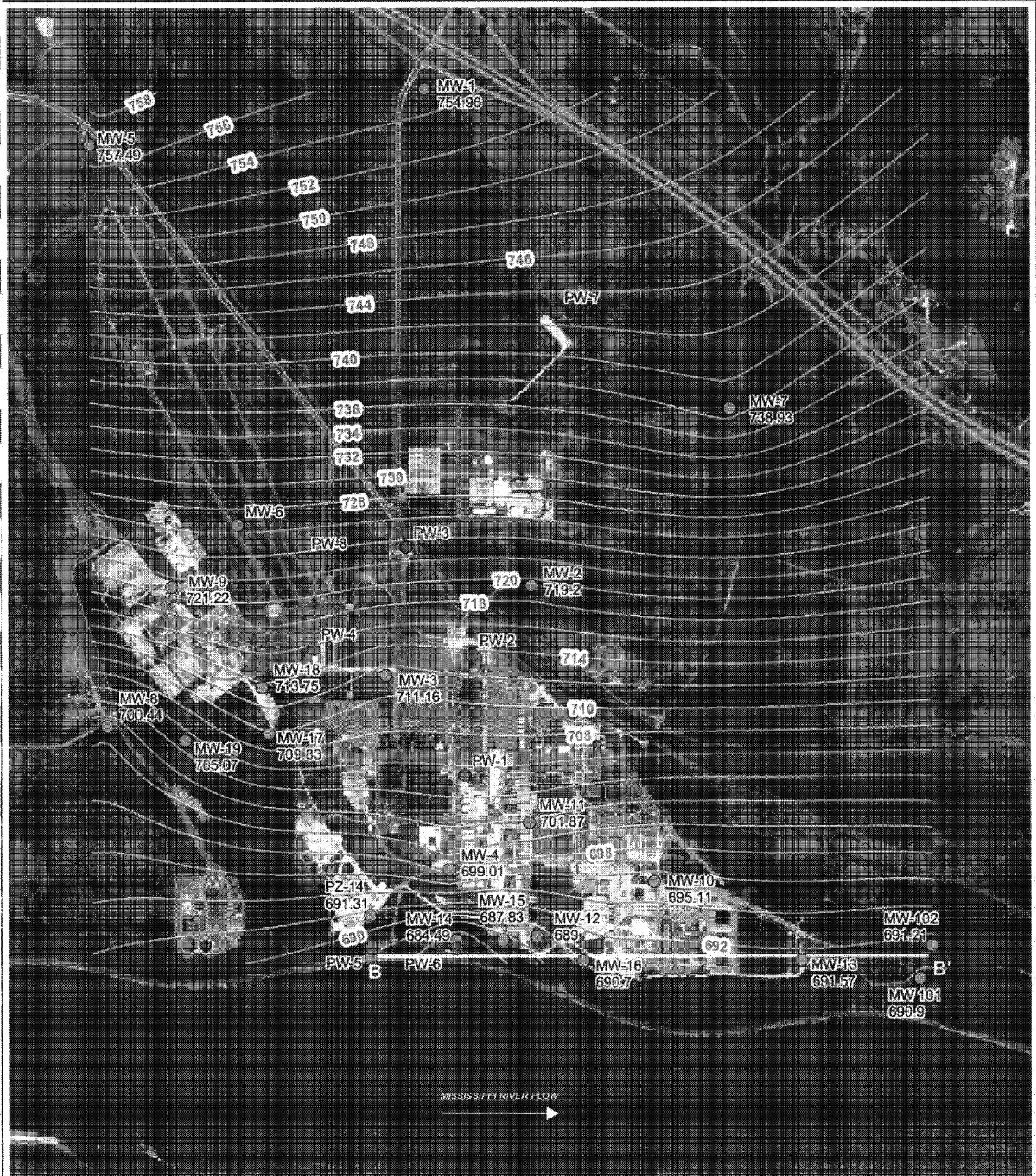


FIGURE 4-1 CROSS SECTION B-B'
3M COTTAGE GROVE, MN FACILITY



Legend:

Groundwater Contour

Monitoring Well

Production Well

Note: Well Locations are Approximate

N E S W

WESTON SOLUTIONS

0 500 1,000 2,000 Feet

Map Source:
U.S. Department of Agriculture, Farm Services Agency,
Aerial Photography Field Office;
National Agricultural Imagery Program (NAIP)
Digital Orthorectified Images (DOQ), Minnesota, 2003

FIGURE 4-2

CROSS SECTION B-B' LOCATION

3M COTTAGE GROVE, MN FACILITY

3MA01551843

WESTON SOLUTIONS

Table 4-1
Summary of FC Concentrations in Cottage Grove Groundwater Samples - March and May 2005

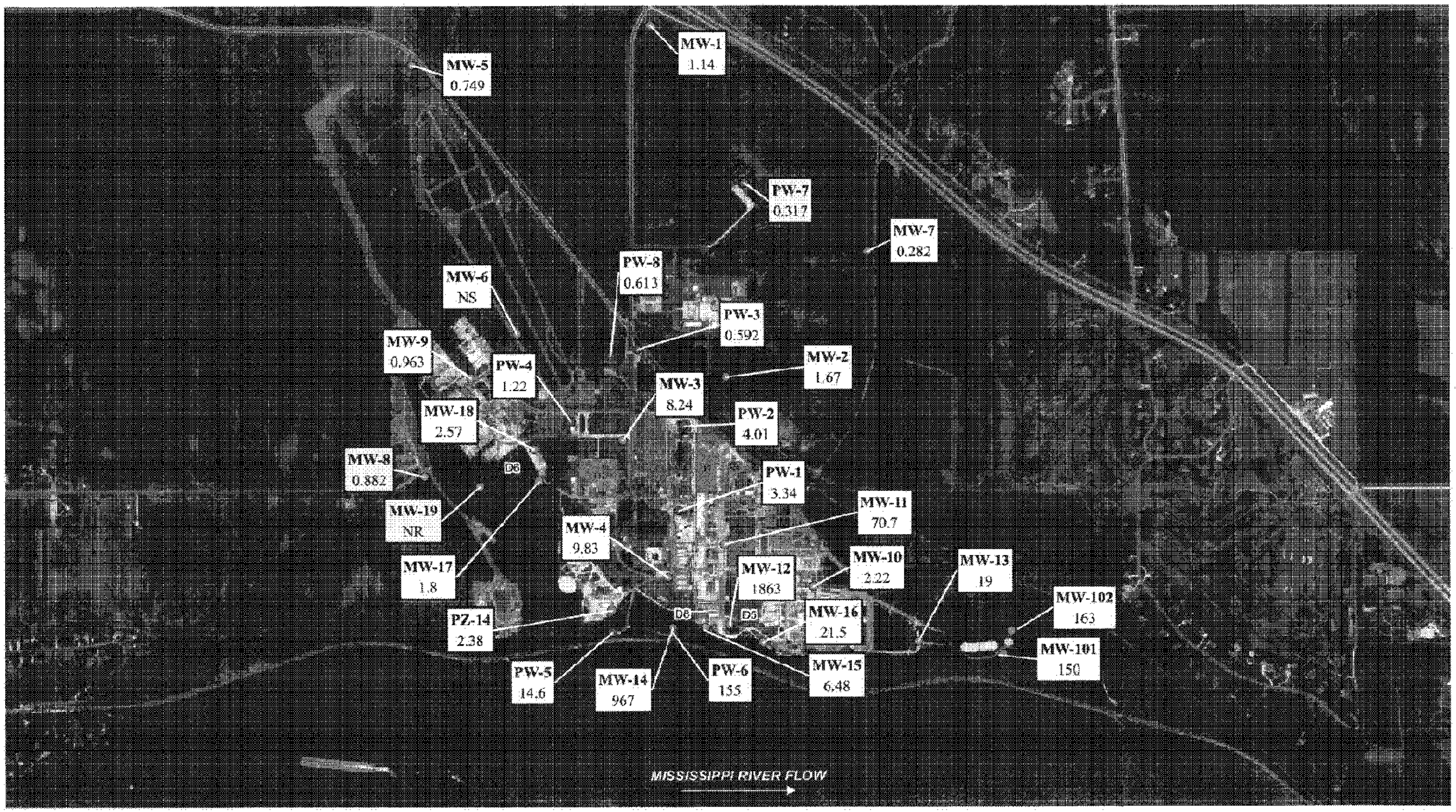
Well ID	PFBS Average (ppb, ug/L)	PFHS Average (ppb, ug/L)	PFOS Average (ppb, ug/L)	PFOA Average (ppb, ug/L)
MW-1	0.076	0.058	0.686	1.14
MW-2	0.050	0.053	ND	1.67
MW-3	0.394	0.352	0.199	8.24
MW-4	15.4	2.13	0.168	9.83
MW-5	NQ	NQ	0.150	0.749
MW-7	0.051	ND	0.129	0.282
MW-8	0.0567	0.171	0.549	0.882
MW-9	0.129	0.358	0.266	0.963
MW-10	16.5	0.386	2.15	2.22
MW-11	13.0	1.96	11.1	70.7
MW-12	180	43.8	198	1863
MW-13	1.45	1.87	16.5	19.0
MW-14	603	29.6	79.3	967
MW-15	1.94	0.537	11.7	6.48
MW-16	13.4	1.83	33.8	21.5
MW-17	0.402	0.487	0.607	1.80
MW-18	0.354	0.980	0.877	2.57
MW-19	NR	NR	0.0597	NR
MW-101	26.8	1583	324	150
MW-102	38.5	87.6	49.8	163
PZ-14	0.372	0.518	0.566	2.38

WESTON SOLUTIONS

Table 4-1
Summary of FC Concentrations in Cottage Grove Groundwater Samples - March and May 2005

Well ID	PFBS Average (ppb, ug/L)	PFHS Average (ppb, ug/L)	PFOS Average (ppb, ug/L)	PFOA Average (ppb, ug/L)
PW-1	0.524	0.167	0.462	3.34
PW-2	0.248	0.172	0.662	4.01
PW-3	NQ	ND	ND	0.592
PW-4	0.118	0.157	ND	1.22
PW-5	2.22	1.88	4.33	14.6
PW-6	47.9	4.78	32.9	155
PW-7	ND	ND	ND	0.317
PW-8	NQ	ND	ND	0.613
B116 (Cafeteria)	ND	ND	ND	ND

ND = Not detected at or above 0.025 ug/L.
NQ = Not quantifiable = Measured concentration between 0.025 ug/L and the Limit of Quantitation (LOQ), which is 0.050 ug/L. NQ value is not factored into the average concentrations.
NR = Not reported due to quality control issues.



Legend:
- Monitoring Well
- Production Well
- Potential Source Area
- PW-5 14.6 — May 2005 Sample Results

Notes:
1. All concentrations are in ug/L (ppb)
2. PFOA concentrations were not detected above the reporting limit in the Building 116 water tap samples.
3. NS - MW-6 was dry during March and May 2005 and could not be sampled.
4. ND - Not detected at or above 0.025ug/L.
5. NR - Not reported due to quality control issues.

N E S W

0 500 1,000
Feet

WESTON

Map Source:
U.S. Department of Agriculture, Farm Services Agency, Aerial Photography Field Office;
National Agricultural Imagery Program (NAIP) Digital Orthorectified Images (DOQ), Minnesota, 2003

FIGURE 4-3
AVERAGE PFOA DETECTED IN GROUNDWATER
MARCH AND MAY 2005

3M COTTAGE GROVE, MN FACILITY

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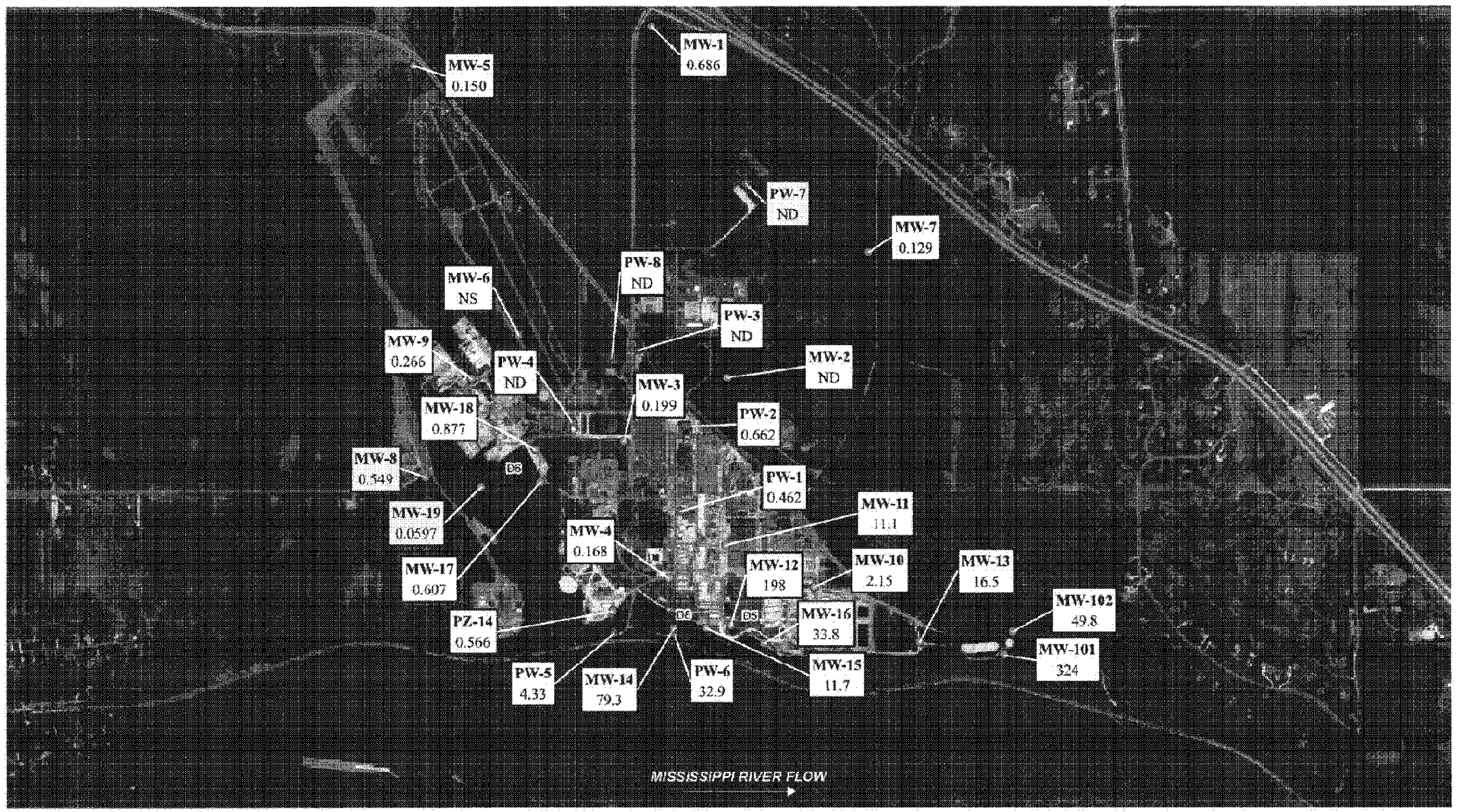

Legend:
- Monitoring Well
- Production Well
- Potential Source Area
- PW-5 4.33 — May 2005 Sample Results

Notes:
1. All concentrations are in ug/L (ppb)
2. PFOS concentrations were not detected above the reporting limit in the Building 116 water tap samples.
3. NS - MW-6 was dry during March and May 2005 and could not be sampled.
4. ND - Not detected at or above 0.025ug/L.

N W E S

0 500 1,000
Feet

WESTON SOLUTIONS

Map Source:
U.S. Department of Agriculture, Farm Services Agency, Aerial Photography Field Office;
National Agricultural Imagery Program (NAIP) Digital Orthorectified Images (DOQ), Minnesota, 2003

FIGURE 4-4
AVERAGE PFOS DETECTED IN GROUNDWATER
MARCH AND MAY 2005

3M COTTAGE GROVE, MN FACILITY

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It is important to note that FCs were not detected in the water samples collected from the water faucet in the Building 116 cafeteria. Water from this faucet has been pre-treated with a granular activated carbon system for removal of FCs.

The remaining analytical data indicate that FCs have been detected in groundwater primarily at and near areas where historic disposal had occurred (i.e., D5 – the Former Solids Burn Pit Area, D8 – a Former Waste Disposal Area, and D1 – the Former HF Tar Neutralization Pit) with much lower concentrations detected with increasing distance from the disposal areas. The highest total concentration of FCs was detected in the groundwater sample from monitoring well MW-12, which is located downgradient of the western portion of D5 - the Former Solids Burn Pit Area. The average PFOA concentration was 1,863 µg/L (ppb) and the average PFOS concentration was 198 ppb.

Wells MW-14 and PW-6 are located downgradient of D8 - Former Waste Disposal Area. At monitoring well MW-14 and production well PW-6, the average PFOA concentrations detected in groundwater were 967 and 155 ppb, respectively, and the average PFOS concentrations were 79.3 and 32.9 ppb, respectively. The highest site-wide average PFBS concentration (603 ppb) in groundwater samples was detected at MW-14.

Monitoring wells MW-101 and MW-102 are located on the south and north side of D1 - Former HF Tar Neutralization Pit, respectively. At monitoring wells MW-101 and MW-102, the average PFOA concentrations detected in groundwater were 150 and 163 ppb, respectively, and the average PFOS concentrations were 324 and 49.8 ppb, respectively. The PFOS concentration at MW-101 was the highest site-wide average PFOS concentration detected in all the groundwater samples. Also, the highest site-wide average PFHS concentration (1,583 ppb) in groundwater samples was detected at MW-101.

4.2.3 LOI Wells – Groundwater Analytical Data

The groundwater analytical data collected under the LOI program generally was consistent with the FC concentrations detected in the groundwater samples collected from the same locations, i.e., MW-4, MW-7, MW-101, PZ-14, and Bldg. 116 tap (cafeteria), in March and May 2005 FC assessment. A summary of the LOI analytical data results from samples collected from June 2003 to June 2005 is provided in Table 4-2. It is

WESTON SOLUTIONS
Restoring Resource Efficiency

Table 4-2 Summary of LOI Analytical Data - June 2003 through June 2005

Location	Date	PFOSA Average (ppb, ug/L)	PFBS Average (ppb, ug/L)	PFHS Average (ppb, ug/L)	PFOS Average (ppb, ug/L)	PFOA Average (ppb, ug/L)
MW-4	6/5/03	ND	5.51	7.31	5.00	10.2
MW-4	10/21/03	ND	2.57	2.75	0.975	8.99
MW-4	5/19/04	ND	7.4	5.59	3.43	16.7
MW-4	9/29/04	ND	7.61	2.48	3.93	NA
MW-4	6/21/05	NA	3.27	2.2	0.132	9.87
MW-7	6/5/03	ND	ND	ND	ND	0.314
MW-7	10/21/03	ND	ND	ND	ND	0.330
MW-7	5/19/04	ND	ND	ND	NQ	0.367
MW-7	9/29/04	ND	ND	ND	ND	NA
MW-7	6/21/05	NA	ND	ND	ND	0.242
MW-101	6/5/03	ND	19.3	1123	224	136
MW-101	10/21/03	ND	16.4	885	120	156
MW-101	5/19/04	ND	23.8	938	188	233
MW-101	9/29/04	ND	42.9	999	253	NA
MW-101	6/21/05	NA	20.2	1410	235	146
PZ-14	6/5/03	ND	1.02	1.85	0.676	4.81
PZ-14	10/21/03	ND	1.28	1.77	0.826	4.06
PZ-14	5/19/04	ND	1.605	1.53	0.872	4.76
PZ-14	9/29/04	ND	2.51	1.55	0.873	NA
PZ-14	6/21/05	NA	0.236	0.414	0.514	1.70
Distribution Loop Sample	6/5/03	0.0525	1.70	1.82	9.44	27.9
Distribution Loop Sample	10/21/03	NQ	0.616	0.444	2.30	6.43
Distribution Loop Sample	5/19/04	0.0632	1.63	1.85	7.12	23.5
Distribution Loop Sample	9/29/04	NQ	0.205	1.08	3.95	NA
Bldg. 116 Tap	6/21/05	NA	ND	ND	ND	ND

Source: LOI analytical data was obtained from 3M and summarized in this table.

PFOSA = Perfluorooctanesulfonamide
ND = Not detected at or above 0.025 ug/L.
NQ = Not quantifiable = Measured concentration is between 0.025 ug/L and the Limit of Quantitation (LOQ), which is 0.050 ug/L. NQ value is not factored into the average concentrations.
NA = Not analyzed for this compound.

important to note that the LOI "distribution loop" samples, which are water samples collected at Bldg. 116 from June 2003 to September 2004, indicate the presence of FCs. During this time period, bottled water was supplied to Bldg. 116 for drinking. No FCs were detected in the LOI sample collected from the Bldg. 116 tap in June 2005. This is consistent with the March 2005 FC assessment results and reflects the fact that a GAC unit had been installed at Bldg. 116 (cafeteria) to remove FCs from the water prior to use.

4.2.4 Woodbury Site

The March, April, and May 2005 groundwater analytical data for the Woodbury Site pumping wells and combined discharge, as well as the discharge from the non-contact process water retention pond at the Cottage Grove facility, are summarized in Table 4-3. Figures 4-5 and 4-6 depict PFOA and PFOS groundwater concentrations, respectively, adjacent to the wells in which they were detected. A copy of the groundwater and combined non-contact cooling water analytical data package (without appendices) is provided in Appendix D.

The data indicate that for the FCs analyzed, PFHS and PFBS were present at higher concentrations in the water samples with lower concentrations of PFOA and PFOS detected. The detected average PFHS concentrations ranged from 1.03 to 23.3 ppb and the detected average PFBS concentrations ranged from 0.337 to 11 ppb. The detected average PFOA concentrations ranged from 0.153 to 3.12 ppb and the detected average PFOS concentrations ranged from 0.0562 to 2.29 ppb. The water samples containing the highest concentrations of FCs were collected from Woodbury Site pumping well R4. It is important to note that no FCs were detected in any sampling round in groundwater samples collected from Woodbury Site pumping well R2.

Finally, FC concentrations in the combined discharge from the Woodbury Site pumping wells were consistent with concentrations in the discharge from the non-contact process water retention pond at the Cottage Grove facility for all three sampling rounds.

Table 4-3
Summary of FCs in Woodbury Site Groundwater Samples - March, April, May 2005

Well ID	Sampling Round	PFBS Average (ppb, ug/L)	PFHS Average (ppb, ug/L)	PFOS Average (ppb, ug/L)	PFOA Average (ppb, ug/L)
R1	1	3.47	2.61	0.069	2.32
R1	2	1.90	2.45	0.062	2.33
R1	3	1.83	2.31	0.0562	2.26
R2	1	ND	ND	ND	ND
R2	2	ND	ND	ND	ND
R2	3	ND	ND	ND	ND
R3	1	0.478	1.17	0.109	0.153
R3	2	0.366	1.20	0.144	0.186
R3	3	0.337	1.03	0.0945	0.159
R4	1	11.0	19.7	2.29	2.82
R4	2	6.24	20.4	2.20	3.12
R4	3	5.72	23.3	1.83	2.78
CWM	1	6.09	10.3	1.23	1.96
CWM	2	7.26	11.6	1.20	2.18
CWM	3	3.51	10.3	0.916	1.99
CWD	1	5.62	8.47	1.34	3.18
CWD	2	7.34	9.61	1.28	2.61
CWD	3	3.40	7.76	1.38	3.22

ND = Not detected at or above 0.025 ug/L
R1 = Recovery well
CWM = Combined discharge from Woodbury pumping wells
CWD = Non-contact cooling water discharge from retention pond at Cottage Grove
Sampling Round: 1 - 3/14/05, 2 - 4/5/05, 3 - 5/12/05

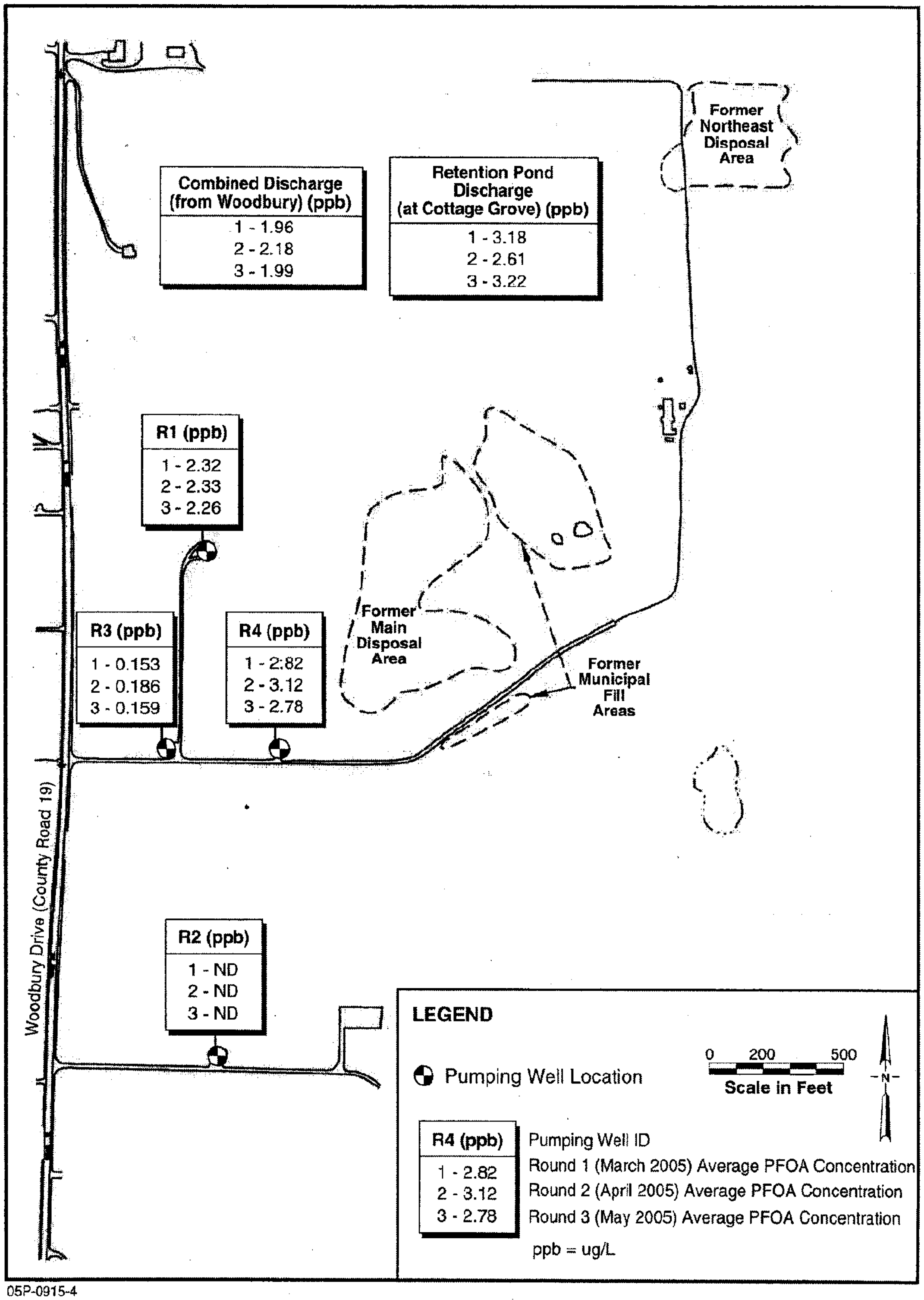
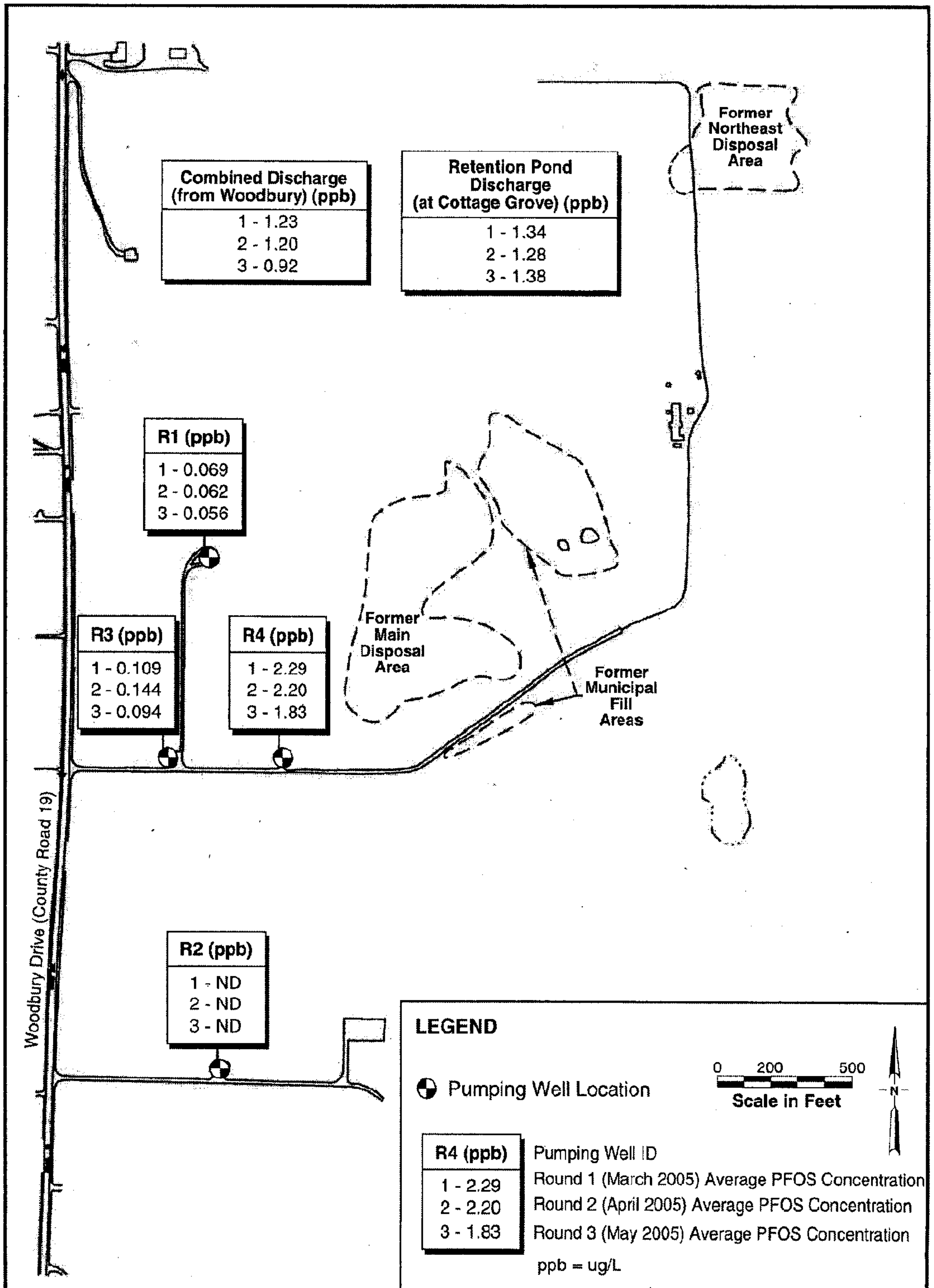


FIGURE 4-5
AVERAGE PFOA DETECTED IN GROUNDWATER – MARCH, APRIL, MAY 2005
WOODBURY SITE



05P-0915-3

FIGURE 4-6
AVERAGE PFOS DETECTED IN GROUNDWATER – MARCH, APRIL, MAY 2005
WOODBURY SITE

4.3 SOIL

The analytical results data for the Cottage Grove soil samples are summarized in Tables 4-4, 4-5, and 4-6 which contain the FC, TOC, and sieve grain size distribution data, respectively. Figures 4-7 and 4-8 depict PFOA and PFOS soil concentrations, respectively. A copy of the groundwater analytical data package (without appendices) is provided in Appendix D.

Due to quality control issues discussed in Section 4.1, quantitative results for certain samples could not be reported and are flagged NR in the tables and figures. Additional analytical work is being performed by 3M in an effort to provide quantitative analytical results for these samples and, if successful, will be reported when available.

Surface Soil Samples - PFOS and PFOA were found at concentrations greater than the detection limit at all locations sampled. Concentrations of PFOS ranged from 1.19 to 1,820 ng/g (ppb) in surface soils (0-6" bgs) and from 1.47 to 1,625 ppb in the shallow subsurface (6-24" bgs) soils. Concentrations of PFOA ranged from 0.902 to 164 ppb in surface soils and from 0.618 to 75.9 ppb in the shallow subsurface soils.

In contrast, PFBS concentrations ranged from non-detect (ND; < 0.2 ppb wet weight) in 12 of the 25 locations to a maximum of 5.98 ppb in surface soil samples. In the shallow subsurface (6-24" bgs) soil samples, PFBS ranged from ND (16 locations) to a maximum of 11.8 ppb. Concentrations of PFHS in surface soils and shallow subsurface soils ranged from ND (6 locations) to 281 ppb and ND (7 locations) to 43.2 ppb, respectively.

Soil Boring Samples - PFOS and PFOA were found at concentrations ranging from ND to 12,350 ppb and from ND to 10,900 ppb, respectively. The highest concentrations of PFOS and PFOA in subsurface soils were present in the D2 and D1 Areas. Concentrations of PFBS and PFHS in the soil boring samples ranged from ND to 22 ppb (highest at the Fire Training Area in FTA 03) and from ND to 1,550 ppb (highest at the D2 Area in D203), respectively.

The following sections provide a discussion of the results of the soil assessment on an area-by-area basis.

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Table 4-4
Summary of FC Concentrations Detected in 3M Cottage Grove Soil Samples - May 2005

Sample ID	Sample Location[1]		Sample Depth Interval (ft bgs)	PFBS Average[2] Dry Weight (ppb,ng/g)	PFHS Average[2] Dry Weight (ppb,ng/g)	PFOS Average[2] Dry Weight (ppb,ng/g)	PFOA Average[2] Dry Weight (ppb,ng/g)
Surface Soil Samples							
CGMN-SS-B10201-0-0000	Outside Building 102	SS B10201	0 - 0.5	ND	0.469	28.9	1.93
CGMN-SS-B10201-0-0005			0.5 - 2	ND	NQ	76.0	1.39
CGMN-SS-B11201-0-0000	Outside Building 112	SS B11201	0 - 0.5	NQ	1.01	62.9	7.63
CGMN-SS-B11201-0-0005			0.5 - 2	ND	NQ	13.4	3.16
CGMN-SS-B1501-0-0000	Outside Building 15	SS B1501	0 - 0.5	5.98	NQ	13.6	19.5
CGMN-SS-B1501-0-0005			0.5 - 2	NQ	NQ	47.0	13.3
CGMN-SS-B1502-0-0000		SS B1502	0 - 0.5	1.34	0.549	15.6	8.79
CGMN-SS-B1502-0-0005			0.5 - 2	ND	ND	61.7	7.77
CGMN-SS-B1601-0-0000	Outside Building 16	SS B1601	0 - 0.5	3.95	ND	2.70	1.72
CGMN-SS-B1601-0-0005			0.5 - 2	11.8	0.747	187	12.5
CGMN-SS-B1602-0-0000		SS B1602	0 - 0.5	2.64	1.61	157	5.05
CGMN-SS-B1602-0-0005			0.5 - 2	0.758	5.77	273	75.9
CGMN-SS-B2201-0-0000	Outside Building 22	SS B2201	0 - 0.5	NQ	ND	2.14	0.902
CGMN-SS-B2201-0-0005			0.5 - 2	ND	ND	17.4	1.92
CGMN-SS-B2201-DB-0005			0.5 - 2	ND	ND	17.6	2.04
CGMN-SS-B2501-0-0000	Outside Building 25	SS B2501	0 - 0.5	0.884	1.52	499	58.2
CGMN-SS-B2501-0-0005			0.5 - 2	ND	2.35	101.0	38.8
CGMN-SS-B2601-0-0000	Outside Building 26	SS B2601	0 - 0.5	1.24	1.20	71.5	13.3
CGMN-SS-B2601-0-0005			0.5 - 2	NQ	2.33	418	18.1
CGMN-SS-B6801-0-0000	Outside Building 68	SS B6801	0 - 0.5	5.00	13.7	833	151
CGMN-SS-B6801-DB-0000			0 - 0.5	4.88	15.9	904	164
CGMN-SS-B6801-0-0005			0.5 - 2	2.19	6.32	542	32.8
CGMN-SS-B801-0-0000	D8 Area	SS D801	0 - 0.5	ND	0.888	525	7.80
CGMN-SS-B801-0-0005			0.5 - 2	ND	1.27	983	38.4
CGMN-SS-BKG01-0-0000	Background	SS BKG01	0 - 0.5	ND	ND	15.3	3.32
CGMN-SS-BKG01-0-0005			0.5 - 2	ND	ND	8.12	3.41
CGMN-SS-D101-0-0000	D1 Area	SS D101	0 - 0.5	ND	ND	14.0	4.66
CGMN-SS-D101-0-0005			0.5 - 2	ND	ND	19.9	1.03
CGMN-SS-D101-DB-0005			0.5 - 2	ND	ND	20.2	0.618

Table 4-4 (continued)

Sample ID	Sample Location[1]		Sample Depth Interval (ft bgs)	PFBS Average[2] Dry Weight (ppb,ng/g)	PFHS Average[2] Dry Weight (ppb,ng/g)	PFOS Average[2] Dry Weight (ppb,ng/g)	PFOA Average[2] Dry Weight (ppb,ng/g)
Surface Soil Samples							
CGMN-SS-D201-0-0000	D2 Area	SS D201	0 - 0.5	ND	1.62	65.4	4.65
CGMN-SS-D201-0-0005			0.5 - 2	ND	1.09	68.4	7.58
CGMN-SS-D202-0-0000		SS D202	0 - 0.5	NQ	4.78	1195	23.7
CGMN-SS-D202-0-0005			0.5 - 2	NQ	6.68	1625	53.1
CGMN-SS-D501-0-0000	D5 Area	SS D501	0 - 0.5	NQ	1.67	147	11.2
CGMN-SS-D501-0-0005			0.5 - 2	0.624	1.34	84.7	6.74
CGMN-SS-D502-0-0000		SS D502	0 - 0.5	ND	0.802	87.9	4.43
CGMN-SS-D502-0-0005			0.5 - 2	NQ	8.12	414	13.2
CGMN-SS-D503-0-0000		SS D503	0 - 0.5	ND	1.14	49.3	11.1
CGMN-SS-D503-0-0005			0.5 - 2	ND	NQ	20.7	2.51
CGMN-SS-D601-0-0000	D6 Area	SS D601	0 - 0.5	NQ	0.919	51.4	17.1
CGMN-SS-D601-0-0005			0.5 - 2	ND	NQ	40.8	27.2
CGMN-SS-D601-DB-0005			0.5 - 2	ND	NQ	40.8	31.0
CGMN-SS-FTA01-0-0000	Fire Training Area	SS FTA01	0 - 0.5	ND	5.28	42.6	4.39
CGMN-SS-FTA01-0-0005			0.5 - 2	ND	1.68	37.7	2.68
CGMN-SS-FTA01-DB-0005			0.5 - 2	ND	1.83	34.5	2.73
CGMN-SS-FTA02-0-0000		SS FTA02	0 - 0.5	4.79	281	1820	89.1
CGMN-SS-FTA02-0-0005			0.5 - 2	1.60	43.2	450	21.2
CGMN-SS-IC01-0-0000	Incinerator Complex	SS IC01	0 - 0.5	ND	0.893	27.7	1.23
CGMN-SS-IC01-0-0005			0.5 - 2	ND	1.40	45.2	1.95
CGMN-SS-IC02-0-0000		SS IC02	0 - 0.5	ND	NQ	9.49	1.98
CGMN-SS-IC02-0-0005			0.5 - 2	ND	ND	6.32	0.874
CGMN-SS-IC03-0-0000		SS IC03	0 - 0.5	ND	ND	1.19	1.41
CGMN-SS-IC03-0-0005			0.5 - 2	ND	ND	1.47	5.40
CGMN-SS-IC04-0-0000		SS IC04	0 - 0.5	ND	ND	8.51	1.23
CGMN-SS-IC04-0-0005			0.5 - 2	ND	ND	19.7	2.21

Table 4-4 (continued)

Sample ID	Sample Location(1)		Sample Depth Interval (ft bgs)	PFBS Average(2) Dry Weight (ppb,ng/g)	PFHS Average(2) Dry Weight (ppb,ng/g)	PFOS Average(2) Dry Weight (ppb,ng/g)	PFOA Average(2) Dry Weight (ppb,ng/g)
Soil Boring Samples							
CGMN-SBC-B1501-0-0000	Outside Building 15	SB B1501	0 - 5	1.76	2.88	619	62.9
CGMN-SBC-B1501-0-0050			5 - 10	1.54	2.78	166	166
CGMN-SBC-B1501-0-0100			10 -15	0.671	2.12	103	191
CGMN-SBC-B1501-0-0150			15 - 20	0.475	0.798	NR	88.3
CGMN-SBC-B1501-0-0200			20 - 25	0.868	NQ	1865	81.6
CGMN-SBC-BKG01-0-0000	Background	SB BKG01	0 - 5	ND	ND	0.607	0.545
CGMN-SBC-BKG01-0-0050			5 - 10	ND	ND	NQ	0.726
CGMN-SBC-BKG01-0-0100			10 -15	ND	ND	ND	0.515
CGMN-SBC-BKG01-DB-0100			10 -15	ND	ND	ND	0.704
CGMN-SBC-BKG01-0-0150			15 - 20	ND	ND	ND	NQ
CGMN-SBC-BKG01-0-0200			20 - 25	ND	ND	0.486	0.977
CGMN-SBC-BKG02-0-0000		SB BKG02	0 - 5	ND	ND	1.94	NQ
CGMN-SBC-BKG02-0-0050			5 - 10	ND	ND	NQ	NQ
CGMN-SBC-BKG02-0-0100			10 -15	ND	ND	ND	NQ
CGMN-SBC-BKG02-DB-0100			10 -15	ND	ND	ND	NQ
CGMN-SBC-BKG02-0-0150			15 - 20	ND	ND	ND	0.611
CGMN-SBC-BKG02-0-0200			20 - 25	ND	ND	ND	0.958
CGMN-SBC-D101-0-0000	D1 Area	SB D101	0 - 5	NQ	1.48	46.2	5.39
CGMN-SBC-D101-0-0050			5 - 10	5.81	7.24	46.4	59.2
CGMN-SBC-D101-0-0100			10 -15	2.00	31.65	64.4	181
CGMN-SBC-D101-DB-0100			10 -15	2.02	30.4	67.0	189
CGMN-SBC-D101-0-0150			15 - 20	1.19	6.79	67.6	25.4
CGMN-SBC-D101-0-0200			20 - 25	0.781	3.41	36.0	18.1
CGMN-SBC-D102-0-0000		SB D102	0 - 5	1.99	8.30	NR	NR
CGMN-SBC-D102-0-0050			5 - 10	2.67	35.6	396	778
CGMN-SBC-D102-0-0100			10 -15	0.483	21.7	134	662
CGMN-SBC-D102-0-0150			15 - 20	NQ	5.33	35.8	120
CGMN-SBC-D102-0-0200			20 - 25	NQ	7.06	252	134

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Table 4-4 (continued)

Sample ID	Sample Location[1]		Sample Depth Interval (ft bgs)	PFBS Average[2] Dry Weight (ppb,ng/g)	PFHS Average[2] Dry Weight (ppb,ng/g)	PFOS Average[2] Dry Weight (ppb,ng/g)	PFOA Average[2] Dry Weight (ppb,ng/g)
Soil Boring Samples							
CGMN-SBC-D103-0-0000	D1 Area	SB D103	0 - 5	ND	ND	84.2	12.7
CGMN-SBC-D103-0-0050			5 - 10	ND	0.727	794	162
CGMN-SBC-D103-0-0100			10 -15	ND	0.843	923	532
CGMN-SBC-D103-0-0150			15 - 20	ND	2.67	219	2340
CGMN-SBC-D103-DB-0150			15 - 20	ND	2.77	227	2425
CGMN-SBC-D103-0-0200			20 - 25	0.816	10.6	574	1510
CGMN-SBC-D103-0-0250			25 - 30	1.41	12.9	384	NR
CGMN-SBC-D103-0-0300			30 - 35	NQ	6.53	226	154
CGMN-SBC-D103-0-0350			35 - 40	0.671	14.6	352	65.4
CGMN-SBC-D103-0-0400			40 - 45	0.773	34.9	351	108
CGMN-SBC-D103-0-0450			45 - 50	NR	9.04	202	85.0
CGMN-SBC-D103-0-0500			50 - 55	ND	4.17	182	53.9
CGMN-SBC-D103-0-0550			55 - 60	NQ	3.84	119	163
CGMN-SBC-D103-0-0600			60 - 65	ND	4.50	189	168
CGMN-SBC-D103-0-0650			65 - 70	NQ	7.90	259	171
CGMN-SBC-D104-0-0000		SB D104	0 - 5	4.71	8.07	NR	NR
CGMN-SBC-D104-0-0050			5 - 10	ND	12.3	771	306
CGMN-SBC-D104-DB-0050			5 - 10	ND	12.1	701	254
CGMN-SBC-D104-0-0100			10 -15	ND	23.6	378	1390
CGMN-SBC-D104-0-0150			15 - 20	0.482	129	109	4520
CGMN-SBC-D104-0-0200			20 - 25	0.574	58.1	68.6	2495
CGMN-SBC-D104-0-0250			25 - 30 ft	0.579	38.2	103	2030
CGMN-SBC-D104-0-0300			30 - 35	0.624	35.8	310	375
CGMN-SBC-D104-0-0350			35 - 40	0.711	63.9	184	192
CGMN-SBC-D104-0-0400			40 - 45	NQ	35.8	122	62.3
CGMN-SBC-D104-0-0450			45 - 50	NQ	24.0	122	164
CGMN-SBC-D104-DB-0450			45 - 50	NQ	24.5	123	162
CGMN-SBC-D104-0-0500			50 - 55	NQ	8.16	88.1	359
CGMN-SBC-D104-0-0550			55 - 60	NQ	6.06	81.1	318
CGMN-SBC-D104-0-0600			60 - 65	ND	6.09	135	181
CGMN-SBC-D104-0-0650			65 - 70	ND	3.57	133	143

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Table 4-4 (continued)

Sample ID	Sample Location[1]		Sample Depth Interval (ft bgs)	PFBS Average[2] Dry Weight (ppb,ng/g)	PFHS Average[2] Dry Weight (ppb,ng/g)	PFOS Average[2] Dry Weight (ppb,ng/g)	PFOA Average[2] Dry Weight (ppb,ng/g)
Soil Boring Samples							
CGMN-SBC-D201-0-0000	D2 Area	SB D201	0 - 5	ND	2.99	724	32.5
CGMN-SBC-D201-0-0050	D2 Area	SB D201	5 - 10	NQ	26.2	2515	363
CGMN-SBC-D201-0-0100	D2 Area	SB D201	10 -15	ND	5.10	254	52.8
CGMN-SBC-D201-DB-0100	D2 Area	SB D201	10 -15	ND	5.99	348	62.4
CGMN-SBC-D201-0-0150	D2 Area	SB D201	15 - 20	3.49	313	11950	4885
CGMN-SBC-D201-0-0200	D2 Area	SB D201	20 - 25	1.49	48.6	2180	726
CGMN-SBC-D201-0-0250	D2 Area	SB D201	25 - 30	4.67	69.2	772	642
CGMN-SBC-D201-0-0300	D2 Area	SB D201	30 - 35	2.02	58.7	339	606
CGMN-SBC-D201-0-0350	D2 Area	SB D201	35 - 40	0.550	34.6	50.0	315
CGMN-SBC-D201-0-0400	D2 Area	SB D201	40 - 45	0.983	37.0	4.39	234
CGMN-SBC-D202-0-0000	D2 Area	SB D202	0 - 5	0.616	34.1	6135	322
CGMN-SBC-D202-0-0050	D2 Area	SB D202	5 - 10	3.74	291	6820	5610
CGMN-SBC-D202-0-0100	D2 Area	SB D202	10 -15	0.671	32.1	1495	574
CGMN-SBC-D202-0-0150	D2 Area	SB D202	15 - 20	3.07	184	12350	2850
CGMN-SBC-D202-0-0200	D2 Area	SB D202	20 - 25	1.41	55.9	6575	689
CGMN-SBC-D202-0-0250	D2 Area	SB D202	25 - 30	1.18	20.1	775	247
CGMN-SBC-D202-0-0300	D2 Area	SB D202	30 - 35	2.25	37.5	794	853
CGMN-SBC-D202-0-0350	D2 Area	SB D202	35 - 40	2.75	30.3	84.0	466
CGMN-SBC-D202-DB-0350	D2 Area	SB D202	35 - 40	3.70	33.8	71.6	506
CGMN-SBC-D202-0-0400	D2 Area	SB D202	40 - 45	2.60	86.5	199	1000
CGMN-SBC-D202-0-0450	D2 Area	SB D202	45 - 50	10.1	120	106	1135
CGMN-SBC-D203-0-0000	D2 Area	SB D203	0 - 5	0.93	32.7	3825	245
CGMN-SBC-D203-0-0050	D2 Area	SB D203	5 - 10	4.07	314	9620	2135
CGMN-SBC-D203-0-0100	D2 Area	SB D203	10 -15	8.38	369	7310	4885
CGMN-SBC-D203-0-0150	D2 Area	SB D203	15 - 20	21.2	1550	10370	10900
CGMN-SBC-D203-0-0200	D2 Area	SB D203	20 - 25	17.8	953	10020	7915
CGMN-SBC-D203-0-0250	D2 Area	SB D203	25 - 30	4.91	50.3	758	466
CGMN-SBC-D203-0-0300	D2 Area	SB D203	30 - 35	7.25	58.8	46.6	581
CGMN-SBC-D203-DB-0300	D2 Area	SB D203	30 - 35	9.3	47.1	43.6	424
CGMN-SBC-D203-0-0350	D2 Area	SB D203	35 - 40	1.62	73.7	12.6	627
CGMN-SBC-D203-0-0400	D2 Area	SB D203	40 - 45	2.21	31.9	9.34	169
CGMN-SBC-D203-0-0450	D2 Area	SB D203	45 - 50	4.44	25.5	19.8	62.0

Table 4-4 (continued)

Sample ID	Sample Location[1]		Sample Depth Interval (ft bgs)	PFBS Average[2] Dry Weight (ppb,ng/g)	PFHS Average[2] Dry Weight (ppb,ng/g)	PFOS Average[2] Dry Weight (ppb,ng/g)	PFOA Average[2] Dry Weight (ppb,ng/g)
Soil Boring Samples							
CGMN-SBC-D501-0-0000	D5 Area	SB D501	0 - 5	1.46	18.7	2310	NR
CGMN-SBC-D501-0-0050			5 - 10	1.73	65.0	827	1375
CGMN-SBC-D501-DB-0050			5 - 10	1.63	64.6	840	1225
CGMN-SBC-D501-0-0100			10 -15	1.47	25.7	693	295
CGMN-SBC-D501-0-0150			15 - 20	ND	0.444	46.8	42.5
CGMN-SBC-D501-0-0200			20 - 25	NQ	0.952	34.5	21.8
CGMN-SBC-D801-0-0000	D8 Area	SB D801	0 - 5	0.549	2.72	597	155
CGMN-SBC-D801-0-0050			5 - 10	2.86	4.88	528	334
CGMN-SBC-D801-0-0100			10 -15	1.76	5.97	694	543
CGMN-SBC-D801-0-0150			15 - 20	0.734	2.76	313	91.3
CGMN-SBC-D801-0-0200			20 - 25	1.18	4.60	370	202
CGMN-SBC-FTA01-0-0000	Fire Training Area	SB FTA01	0 - 5	9.98	371	NR	211
CGMN-SBC-FTA01-0-0050			5 - 10	2.09	93.7	75.6	45.3
CGMN-SBC-FTA01-0-0100			10 -15	2.05	33.6	21.7	17.0
CGMN-SBC-FTA01-0-0150			15 - 20	1.48	54.3	24.9	36.5
CGMN-SBC-FTA01-0-0200			20 - 25	1.65	198	82.2	NR
CGMN-SBC-FTA02-0-0000		SB FTA02	0 - 5	NQ	28.6	378	9.29
CGMN-SBC-FTA02-0-0050			5 - 10	ND	8.32	48.7	2.11
CGMN-SBC-FTA02-0-0100			10 -15	ND	6.37	12.8	1.84
CGMN-SBC-FTA02-DB-0100			10 -15	ND	6.67	12.3	1.99
CGMN-SBC-FTA02-0-0150			15 - 20	ND	19.8	18.1	3.99
CGMN-SBC-FTA02-0-0200			20 - 25	ND	22.2	16.1	5.13
CGMN-SBC-FTA03-0-0000		SB FTA03	0 - 5	22.0	301	863	403
CGMN-SBC-FTA03-0-0100			5 - 10	1.06	10.6	12.3	57.3
CGMN-SBC-FTA03-0-0100			10 -15	NQ	1.96	1.85	15.1
CGMN-SBC-FTA03-0-0150			15 - 20	ND	0.750	1.35	5.12
CGMN-SBC-FTA03-0-0200			20 - 25	0.977	7.71	1.72	148

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Table 4-4 (continued)

Sample ID	Sample Location[1]		Sample Depth Interval (ft bgs)	PFBS Average[2] Dry Weight (ppb,ng/g)	PFHS Average[2] Dry Weight (ppb,ng/g)	PFOS Average[2] Dry Weight (ppb,ng/g)	PFOA Average[2] Dry Weight (ppb,ng/g)
Soil Boring Samples							
CGMN-SBC-WPA01-0-0000	Former Wastewater Pond Area	SB WPA01	0 - 5 ft	NQ	NQ	131	32.2
CGMN-SBC-WPA01-0-0050			5 - 10 ft	ND	NQ	42.6	19.3
CGMN-SBC-WPA01-0-0100			10 -15 ft	ND	NQ	58.0	21.3
CGMN-SBC-WPA01-DB-0100			10 -15 ft	ND	NQ	56.1	16.2
CGMN-SBC-WPA01-0-0150			15 - 20 ft	1.75	6.42	805	27.7
CGMN-SBC-WPA01-0-0200			20 - 25 ft	5.96	NR	NR	NR

(1) See Figures 3-3, 4-5, and 4-6 for sample and area locations.

(2) Concentrations shown are the arithmetic means of the primary sample and laboratory replicate sample results.

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control issues.

DB = Field duplicate sample

WESTON SOLUTIONS
Restoring Resource Efficiency

Table 4-5

Summary of TOC Concentrations in 3M Cottage Grove Soil Samples - May 2005

Sample ID	Sample Location (1)		Sample Depth Interval (ft bgs)	TOC (mg/kg)
CGMN-SBC-D101-0-0200	D1 Area	SB D101	20-25	380
CGMN-SBC-D103-0-0350	D1 Area	SB D103	35-40	240
CGMN-SBC-D103-0-0500	D1 Area	SB D103	50-55	240
CGMN-SBC-D104-0-0100	D1 Area	SB D104	10-15	350
CGMN-SBC-D104-0-0450	D1 Area	SB D104	45-50	310
CGMN-SBC-D201-0-0200	D2 Area	SB D201	20-25	1400
CGMN-SBC-D501-0-0150	D5 Area	SB D501	15-20	990
CGMN-SBC-D801-0-0050	D8 Area	SB D801	5-10	3100
CGMN-SBC-B1501-0-0100	Outside Building 15	SB 1501	10-15	530
CGMN-SBC-FTA02-0-0150	Fire Training Area	SB FTA02	15-20	5700
CGMN-SBC-WPA01-0-0150	Former Wastewater Pond Area	SB WPA01	15-20	3200
CGMN-SBC-BKG01-0-0000	Background	SB BKG01	0-5	860

(1) See Figure 3-3 for sample and area locations.

Table 4-6

Summary of Sieve Grain Size Distribution in 3M Cottage Grove Soil Samples - May 2005

Sample ID	Sample Location [1]		Sample Depth Interval (ft bgs)	Cc	Cu	D100 (mm)	D60 (mm)	D30 (mm)	D10 (mm)	% Gravel	% Sand	% Silt and Clay	% Silt	% Clay
CGMN-SBC-D101-0-0200	D1 Area	SB D101	20-25	1.63	6.83	12.5	0.9	0.4	0.1	7.3	85.0	7.6	SP	SP
CGMN-SBC-D103-0-0350	D1 Area	SB D103	35-40	0.66	7.01	19	0.6	0.2	0.1	7.3	85.1	7.6	SP	SP
CGMN-SBC-D103-0-0500	D1 Area	SB D103	50-55	1.54	3.34	19	0.6	0.4	0.2	4.7	91.0	4.3	SP	SP
CGMN-SBC-D104-0-0100	D1 Area	SB D104	10-15	1.32	3.78	19	0.8	0.5	0.2	5.8	88.3	5.9	SP	SP
CGMN-SBC-D104-0-0450	D1 Area	SB D104	45-50	1.25	2.76	12.5	0.5	0.3	0.2	1.3	96.3	2.4	SP	SP
CGMN-SBC-D201-0-0200	D2 Area	SB D201	20-25	2.24	20.27	4.7	0.1	0.0	0.0	0.0	46.2	53.8	43.8	10.0
CGMN-SBC-D501-0-0150	D5 Area	SB D501	15-20	1.31	3.06	9.5	0.5	0.3	0.2	0.5	93.2	6.2	SP	SP
CGMN-SBC-D801-0-0050	D8 Area	SB D801	5-10			4.7	0	0		0.0	4.7	95.3	76.3	19.0
CGMN-SBC-B1501-0-0100	Outside Building 15	SB 1501	10-15	1.51	4.90	19	0.5	0.3	0.1	4.2	87.7	8.1	SP	SP
CGMN-SBC-FTA02-0-0150	Fire Training Area	SB FTA02	15-20	1.21	3.12	12.5	0.5	0.3	0.2	1.7	93.6	4.8	SP	SP
CGMN-SBC-WPA01-0-0150	Former Wastewater Pond Area	SB WPA01	15-20	1.62	143.41	9.5	0.3	0	0	0.0	65.4	34.6	20.6	14.0
CGMN-SBC-BKG01-0-0000	Background	SB BKG01	0-5	1.26	3.47	19	0.7	0.4	0.2	6.6	88.6	4.8	SP	SP

[1] See Figure 3-3 for sample and area locations.

Cc=Coefficient of Gradiation=$D30^2/(D60 \times D10)$
Cu = Uniformity coefficient=D60/D10
D10 = The maximum size of the smallest 10 percent of the sample.
D30 = The maximum size of the smallest 30 percent of the sample.
D60 = The maximum size of the smallest 60 percent of the sample.
D100 = The maximum size of 100 percent of the sample.
SP - Poorly graded sand.

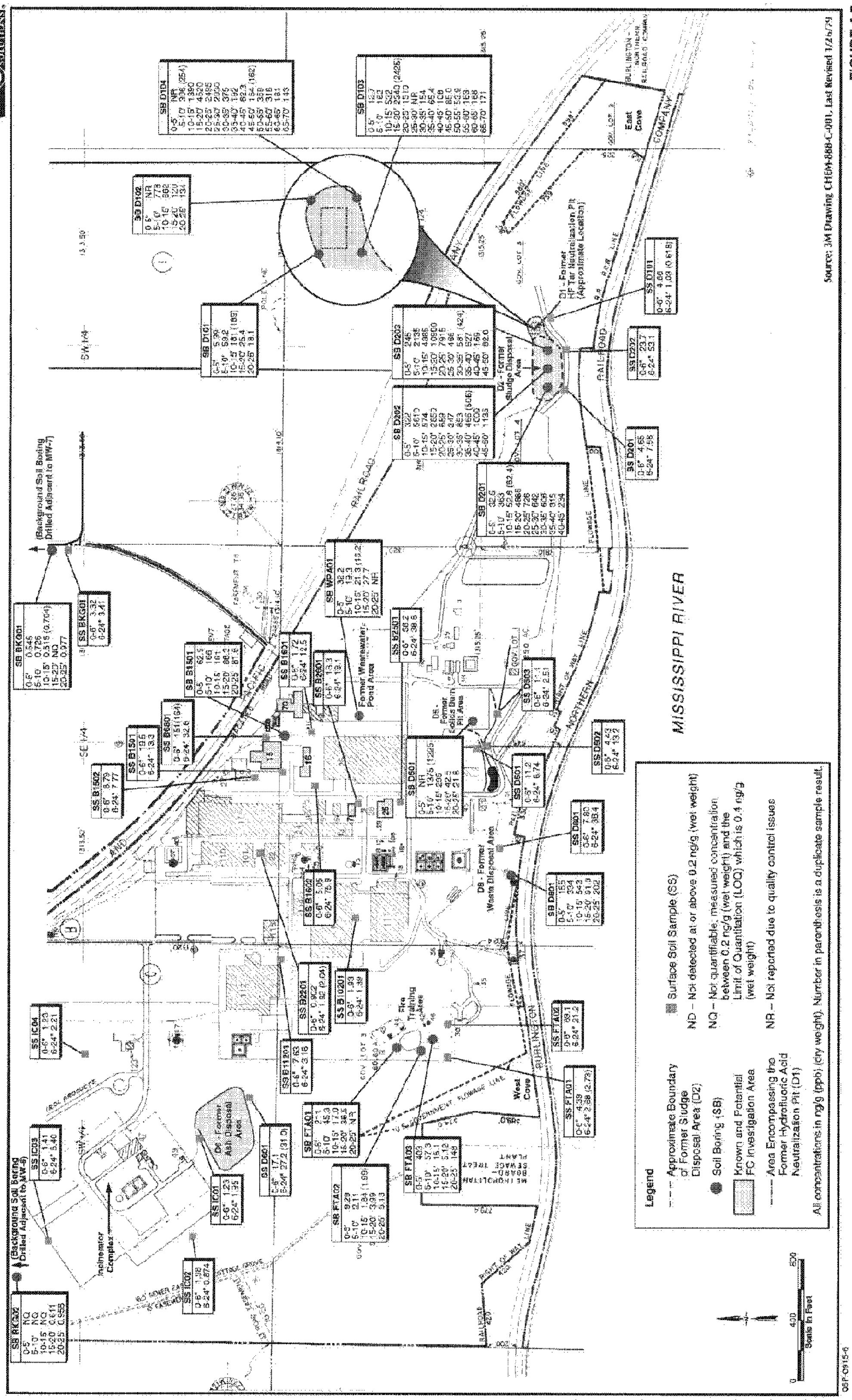


FIGURE 4-7
AVERAGE PFOA DETECTED IN SOILS – MAY 2005
3M COTTAGE GROVE, MN FACILITY

4-25

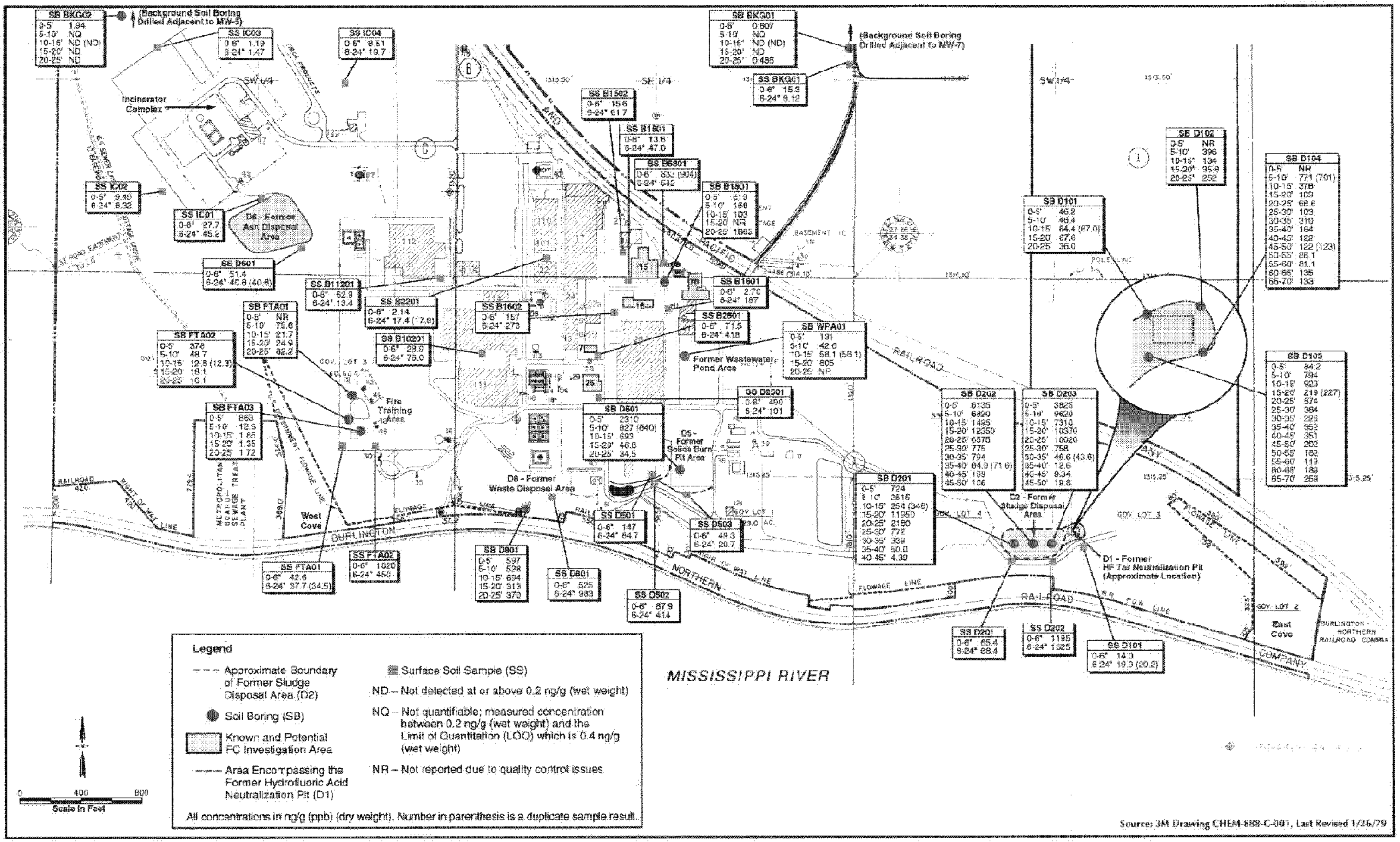


FIGURE 4-8
AVERAGE PFOS DETECTED IN SOILS – MAY 2005
3M COTTAGE GROVE, MN FACILITY

4.3.1 D1 Area – Former HF Tar Neutralization Pit

Soil Description – The soil boring logs for the D1 area indicate that the soil consists of predominantly of light yellow brown silty medium- to coarse-grained sand. WESTON did not observe any discoloration or odors.

Analytical Data - In the D1 Former HF Tar Neutralization Pit Area, the highest FC concentrations were detected in the two soil borings on the presumed downgradient/ south side of this area (D103 and D104) in the 5 to 30 ft bgs depth range and decreased below 30 ft bgs in the native soils. PFOA was detected at higher concentrations than PFOS in these borings with concentrations ranging from 12.7 to 4,520 ppb relative to the PFOS concentrations that ranged from 68.6 to 923 ppb.

4.3.2 D2 Area – Former Sludge Disposal Area

Soil Description – Observation of soil samples from the borings indicated the presence of fill (i.e., sludge material) associated with the D2 Area to approximately 22 to 29 ft bgs. The fill consisted of yellow brown to olive to dark gray poorly sorted silty sand with varying amounts of organic material and paint chips. The fill was locally stained dark gray to black. At soil boring D203, elevated OVM readings were recorded in the fill with the maximum reading occurring at 16 to 18 ft bgs. OVM readings were not detected in soil below the fill material. The underlying soil consists predominantly of yellowish brown to olive brown silty medium- to coarse-grained sand. Soil at D203 was typically light gray to olive sand. Residual glacial outwash gravels were observed locally.

Analytical Data - The highest FC concentrations in soil samples were detected in the D2 Former Sludge Disposal Area. The maximum concentrations of PFOS (12,350 ppb), PFOA (10,900 ppb), and PFHS (1,550 ppb) were detected at soil borings D202, D203, and D203, respectively. In this area, the higher FC concentrations occur in the 0 to 25 ft bgs samples, which is within the sludge material. Additionally, in each of the D2 Area soil borings (D201, D202, and D203), PFOS generally is found at higher concentrations than PFOA in the 0 to 25 ft bgs samples. PFOS was detected with concentrations of 1,195 and 1,625 ppb in the 0-6 in and 6-24 in bgs depth, respectively, at surface soil location D202. PFOA generally is found at higher concentrations than PFOS at the lower depth intervals in the native soils underlying the area.

4.3.3 D5 Area – Former Solids Burn Pit

Soil Description – Observation of soil from the one boring D501 constructed in the D5 Area indicated the presence of predominantly olive brown silty coarse-grained sand to six ft bgs. Soil from six to 14 ft bgs consists of black silty medium-grained sand with some gravel, ash and charcoal. Soil below 14 feet bgs consists of light yellowish brown silty medium-grained sand to boring termination at 25 feet bgs. WESTON did not observe any odors for the entire boring.

Analytical Data - In the D5 Area soil boring D501, higher concentrations of PFOA and PFOS (295 to 1,375 ppb PFOA and 693 to 2,310 ppb PFOS) occurred in the 0 to 15 ft bgs depth range and concentrations dropped significantly (less than 50 ppb) at lower depths. The surface soil samples downgradient of this area contained lower concentrations except for one soil sample collected at D502 in the 6 to 24 in bgs interval, which contained at PFOS concentration of 414 ppb.

4.3.4 D8 Area – Former Waste Disposal Area

Soil Description – Observation of soil from boring D801 indicated the presence of predominantly of dark yellowish brown clayey sandy silt to a depth of 14 ft bgs. Bluish gray clayey sandy silt to strong brown silty sand were observed from 14 to 16 feet bgs followed by olive silty fine-grained sand and light yellowish brown silty sand to boring termination at 25 feet bgs. WESTON did not observe any waste material, discoloration or odors.

Analytical Data - Concentrations of PFOS and PFOA (155 to 543 ppb PFOA and 528 to 694 ppb PFOS) were detected in the 0 to 15 ft bgs depth range and concentrations greater than 100 ppb were detected down to boring termination at 25 ft bgs. The surface soil sample (D801) in this area contained PFOS concentrations of 525 and 983 ppb in the 0-6 in and 6-24 in bgs surface soil samples, respectively.

4.3.5 Fire Training Area

Soil Description – Observation of soil from the three borings indicated the presence of predominantly light yellowish brown silty sand to gravelly silty sand. The sand ranged from fine-grained to coarse-grained. Glacial outwash gravel was locally abundant. WESTON did not observe any discoloration or odors.

Analytical Data - In this area, PFOS concentrations of 378 and 863 ppb were found in the shallow interval of 0 to 5 ft bgs of borings FTA02 and FTA03 respectively, with significantly lower concentrations (ranging from 1.35 to 82.2 ppb) at lower depth intervals. It should be noted that the area around boring FTA03 has been substantially altered with the construction of a new run-off control basin. PFOS was detected at concentrations of 1,820 and 450 ppb in the surface soil samples (0–6 and 6–24 in bgs, respectively) collected at sampling location FTA02, which is in a drainageway from the Fire Training/Contractor Yard Area. It was also found that at the Fire Training Area, the detected concentrations of PFHS generally were greater than the detected concentrations of PFOA.

4.3.6 Building 15 Area

Soil Description – Observation of soil from the boring indicated the presence of a dark brown silty sand to a depth of approximately 8 feet bgs followed by predominantly a light yellowish brown silty sand to boring termination. WESTON did not observe any discoloration or odors.

Analytical Data - At the Building 15 area, PFOS concentrations were detected in soil boring B1501 at the shallow interval of 0 to 5 ft bgs (619 ppb) and at a depth of 20 to 25 ft bgs (1,865 ppb). It had also been detected at concentrations of 833/904 (duplicate) and 542 ppb in the surface soil samples (0-6" and 6-24" bgs, respectively) collected at sampling location B6801, which is adjacent to the soil boring.

4.3.7 Former Wastewater Pond Area

Soil Description – Observation of soil from the boring indicates the presence of asphalt and crushed rock to a depth of approximately one foot bgs. Soil from one foot to six feet bgs consisted of black to very dark grayish green silty to clayey silty sand. Soil below a depth of six feet bgs consisted of olive brown silty sand to 16 feet bgs followed by very dark bluish gray silty sand with a strong odor from 16 feet to boring termination at 25 ft bgs. The lower soil horizon exhibited strong odors and OVM readings up to 90 units. No other indication of residue or waste material was noted.

Analytical Data – PFOS was detected at a concentration of 805 ppb at a depth of 15 to 20 ft bgs in soil boring WPA01. The concentrations of PFOA detected in this boring were lower.

4.3.8 Other Site Areas

Incinerator Complex and D6 Area - Four surface soil sampling (0–6" and 6–24" bgs) locations (IC01, IC02, IC03, and IC04) were situated around the incinerator complex and one (D601) was downgradient of the D6 – Former Ash Disposal Area. The concentrations of PFOS detected in these areas ranged from 1.19 to 45.2 ppb. The concentrations of PFOA ranged from 1.23 to 31.0 ppb.

Non-FC Management Areas - Three surface soil sampling (0–6" and 6–24" bgs) locations were situated around Buildings 112 (B11201), 102 (B10201), and 22 (B2201), which were not associated with FC management operations. The concentrations of PFOS detected in these areas ranged from 2.14 to 76.0 ppb. The concentrations of PFOA ranged from 0.902 to 7.63 ppb.

FC Management Areas - Four surface soil sampling locations (0–6" and 6–24" bgs) were situated adjacent to Buildings 16 (B1601 and B1602), 7 (B2601), and 25 (B2501), which were associated with FC management operations. The concentrations of PFOS detected in these areas ranged from 2.70 to 499 ppb. The concentrations of PFOA ranged from 1.72 to 75.9 ppb.

4.3.9 Background

Soil Description – Observation of soil boring BKG01 indicated soil consisting predominantly of light olive brown silty coarse-grained sand to olive yellow clayey silty medium-grained sand to 21 feet bgs. Weathered dolomite was encountered at 21 feet bgs with auger refusal encountered at 22 feet bgs.

Observation of soil boring BKG02 indicated a dark reddish brown silty coarse-grained sand to approximately six ft bgs followed by light olive brown silty sand to 23.5 ft bgs. The soil becomes gravelly at 18 ft bgs. Auger refusal was encountered at 23.5 ft bgs and dolomite cuttings. WESTON did not observe any discoloration or odors at either of the borings.

Analytical Data – The concentrations of PFOS detected in the background area soil borings (BKG01 and BKG02) ranged from ND to 1.94 ppb. It was detected in the surface soil sample (BKG01) at concentrations of 15.3 and 8.12 ppb at the 0-6" and 6–24" bgs depth, respectively.

The concentrations of PFOA detected in the background area soil borings ranged from NQ to 0.977 ppb. It was detected in the surface soil sample (BKG01) at concentrations of 3.32 and 3.41 ppb at the 0-6" and 6–24" bgs depth, respectively.

4.4 SEDIMENT AND SURFACE WATER

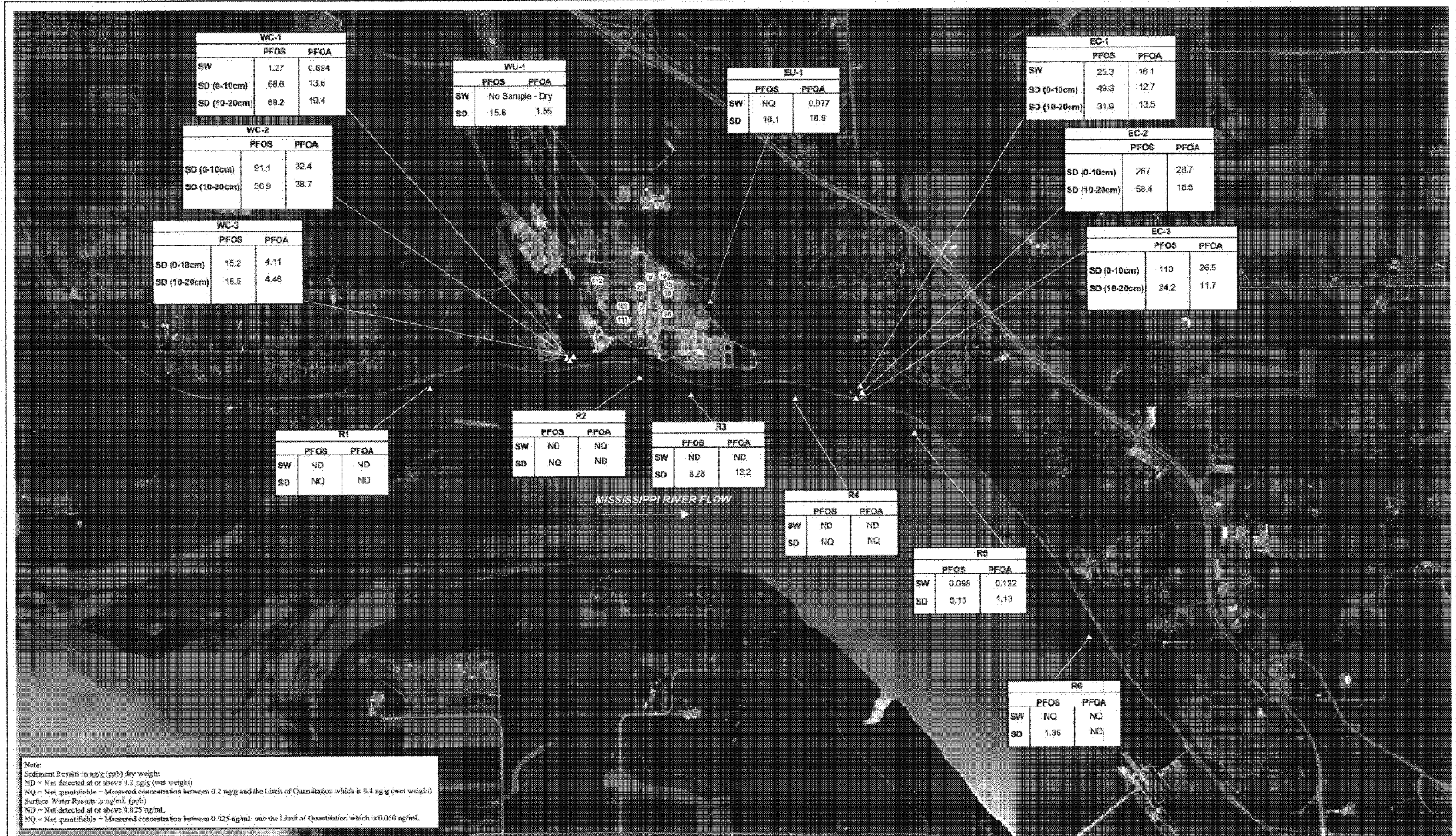
The sediment analytical data for the Cottage Grove facility are summarized in Table 4-7. Figure 4-9 depicts the average PFOS/PFOA sediment concentrations adjacent to the locations where they were detected. A copy of the analytical data package (without appendices) is provided in Appendix D.

The surface water analytical data for the Cottage Grove facility are summarized in Table 4-8 and field-measured surface water sample parameters are summarized in Table 4-9. Figure 4-9 depicts the average PFOS/PFOA surface water concentrations adjacent to the locations where they were detected. A copy of the analytical data package (without appendices) is provided in Appendix D.

Table 4-7
Summary of FC Concentrations Detected in Sediment Samples - August 2005
Cottage Grove, MN

Sample ID	Sample Location[1]		Sample Depth Interval (cm)	PFBS Average[2] Dry Weight (ppb,ng/g)	PFHS Average[2] Dry Weight (ppb,ng/g)	PFOS Average[2] Dry Weight (ppb,ng/g)	PFOA Average[2] Dry Weight (ppb,ng/g)
CGMN-SD-MR001-0-050809	Mississippi River	R1	0-10	ND	ND	NQ	ND
CGMN-SD-MR002-0-050809		R2	0-10	ND	ND	NQ	ND
CGMN-SD-MR003-0-050809		R3	0-10	0.680	1.67	8.28	13.2
CGMN-SD-MR004-0-050809		R4	0-10	ND	ND	NQ	NQ
CGMN-SD-MR005-0-050809		R5	0-10	ND	ND	6.13	1.13
CGMN-SD-MR006-0-090809		R6	0-10	ND	ND	1.35	ND
CGMN-SD-WU011-0-050812	Upstream of West Cove	WU-1	0-10	ND	1.43	15.8	1.55
CGMN-SD-WC011-0-050810	West Cove	WC-1	0-10	ND	6.43	68.6	13.6
CGMN-SD-WC012-0-050810			10-20	ND	8.98	69.2	19.4
CGMN-SD-WC021-0-050810		WC-2	0-10	NQ	10.6	91.1	32.4
CGMN-SD-WC022-0-050810			10-20	NQ	7.32	36.9	38.7
CGMN-SD-WC031-0-050810		WC-3	0-10	ND	2.18	15.2	4.11
CGMN-SD-WC032-0-050810			10-20	ND	2.08	18.5	4.46
CGMN-SD-EU011-0-050812	Upstream of East Cove	EU-1	0-10	ND	0.866	10.1	18.9
CGMN-SD-EC011-0-050810	East Cove	EC-1	0-10	1.35	1.61	49.3	12.7
CGMN-SD-EC012-0-050810			10-20	1.10	1.28	31.9	13.5
CGMN-SD-EC021-0-050810		EC-2	0-10	4.12	5.82	267	28.7
CGMN-SD-EC022-0-050810			10-20	6.61	2.45	58.4	16.5
CGMN-SD-EC031-0-050810		EC-3	0-10	1.47	2.85	110	26.5
CGMN-SD-EC032-0-050810			10-20	2.27	1.19	24.2	11.7

(1) See Figure 4-7 for sample locations.
(2) Concentrations shown are the arithmetic means of the primary sample and laboratory replicate sample results. NQ value is not factored into the average calculations.
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).



Legend:

△ Surface Water/Sediment Sampling Location

0 1,000 2,000 Feet

WESTON

Map Source:
U.S. Department of Agriculture, Farm Services Agency, Aerial Photography Field Office;
National Agriculture Imagery Program (NAIP) Digital Orthorectified Images (DOQ), Minnesota, 2003

FIGURE 4-9
AVERAGE PFOS AND PFOA DETECTED IN
SURFACE WATER AND SEDIMENT-AUGUST 2005

3M COTTAGE GROVE, MN FACILITY

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Table 4-8
Summary of FC Concentrations Detected in Surface Water Samples - August 2005
Cottage Grove, MN

Sample ID	Sample Location[1]		PFBS Average[2] (ppb, ng/mL)	PFHS Average[2] (ppb, ng/mL)	PFOS Average[2] (ppb, ng/mL)	PFOA Average[2] (ppb, ng/mL)
CGMN-SW-MR001-0-050809	Mississippi River	R1	NQ	ND	ND	ND
CGMN-SW-MR002-0-050809		R2	0.050	0.077	ND	NQ
CGMN-SW-MR003-0-050809		R3	NQ	ND	ND	ND
CGMN-SW-MR004-0-050809		R4	NQ	ND	ND	ND
CGMN-SW-MR005-0-050809		R5	0.097	NQ	0.098	0.132
CGMN-SW-MR006-0-050809		R6	NQ	ND	NQ	NQ
CGMN-SW-EU011-0-050812	Upstream of East Cove	EU-1	NQ	NQ	NQ	0.077
CGMN-SW-EC011-0-050810	East Cove	EC-1	13.1	4.71	25.3	16.1
CGMN-SW-WC011-0-050810	West Cove	WC-1	0.082	0.36	1.27	0.694

(1) See Figure 4-7 for sample locations.
(2) Concentrations shown are the arithmetic means of the primary sample and laboratory replicate sample results. NQ value is not factored into the average calculations.
ND = Not detected at or above 0.025 ng/mL
NQ = Not quantifiable = Measured concentration between 0.025 ng/mL and the Limit of Quantitation (LOQ) which is 0.050 ng/mL.

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Table 4-9
Summary of Field-Measured Parameters in Surface Water Samples - August 2005
Mississippi River and Coves
Cottage Grove, MN

Sample Location[1]	Sample ID	Latitude	Longitude	Temperature (°C)	Conductivity (us/cm^2)	Dissolved Oxygen (mg/L)	pH	Oxidation-Reduction Potential	Turbidity (ntu)	Water Depth (ft)
R1	CGMN-SW-MR001-0-050809	44 47.045	092 55.792	27.25	0.61	9.14	8.64	-42.5	15.5	11
R2	CGMN-SW-MR002-0-050809	44 47.083	092 54.712	26.70	0.61	7.56	8.6	-47.2	14.4	8.6
R3	CGMN-SW-MR003-0-050809	44 47.019	092 54.447	26.55	0.60	6.75	8.57	-42.1	17.8	10
R4	CGMN-SW-MR004-0-050809	44 47.003	092 53.908	26.70	0.60	7.01	8.59	-56	15.7	5.6
R5	CGMN-SW-MR005-0-050809	44 46.875	092 53.292	26.80	0.61	7.1	8.61	-45.2	10.2	6
R6	CGMN-SW-MR006-0-050809	44 46.119	092 52.399	27.40	0.62	9.83	8.65	-56.5	48.6	24
EC-1	CGMN-SW-EC011-0-050810	44 47.003	092 53.596	25.11	1.14	10.18	8.14	-25.5	1.6	1
WC-1	CGMN-SW-WC011-0-050810	44 47.005	092 63.586	22.90	0.63	5.91	8	-279.8	17.4	1

(1) See Figure 4-7 for sample locations.

4.4.1 East and West Coves

4.4.1.1 Sediment

The average PFOS concentrations detected in sediment samples at the east cove ranged from 24.2 to 267 ppb and at the west cove they ranged from 15.2 to 91.1 ppb. The average PFOA concentrations detected at the east cove ranged from 11.7 to 28.7 ppb and at the west cove they ranged from 4.11 to 38.7 ppb. No significant concentration differences were found for PFOS or PFOA in the two sample depths at the west cove and for PFOA in the two sample depths at the east cove. However, at the east cove, the detected average PFOS concentrations were higher in the 0–10 cm sample depth than in the deeper 10–20 cm sample. The upstream sediment average concentrations of PFOS and PFOA for the east and west cove drainageways were all in the same range with average detected concentrations from 1.55 to 18.9 ppb.

4.4.1.2 Surface Water

The average concentration of FCs detected in the east cove surface water sample were greater than the concentrations detected in the west cove sample. The highest detected average concentrations in the east cove were 25.3 and 16.1 ppb, respectively, for PFOS and PFOA. The average concentration of PFOA detected in the upstream surface water sample at the east cove was 0.077 ppb. The remaining FCs were NQ in this surface water sample. A surface water sample was not collected upstream of the west cove because the drainageway was dry at the time of sampling.

4.4.1.3 NPDES Analytical Data

After treatment, wastewater is discharged into the ravine located east of the WWTP ponds, at an NPDES station identified as SD 001. The ravine flows into the east cove. The NPDES FC analytical data collected at station SD 001 since 2000 has been summarized in Tables 4-10 through 4-12.

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Table 4-10
Summary of NPDES FC Analytical Data - 2000 to 2003

	Sample Date	Carboxylates		Sulfonates		
		PFHA (ppb)	PFOA (ppb)	PFBS (ppb)	PFHS (ppb)	PFOS (ppb)
Jan-March 2000[1]	-	123.5	1991.3	873.6	17.4	1403.6
Sept-Oct 2000[2]	-	28.7	216.3	63.7	11.3	262.0
December 2002	-	91.0	180.0	51.0	5.80	550.0
January 2003	1/15/03	20.4	80.1	42.4	6.5	200
January 2003		20.1	77.9	45.6	6.7	177
January 2003 Average		20.3	79.0	44.0	6.6	189
February 2003	2/12/03	16.8	80.0	32.4	5.4	64.8
February 2003		16.4	78.8	31.0	5.9	61.7
February 2003 Average		16.6	79.4	31.7	5.6	63.3
March 2003	3/12/03	11.8	74.3	13.8	5.5	61.4
March 2003		12.0	74.7	13.8	5.6	74.7
March 2003 Average		11.9	74.5	13.8	5.6	68.1
April 2003	4/23/03	34.1	112.0	2370	6.6	60.1
April 2003		34.8	109.0	2180	6.7	72.0
April 2003 Average		34.5	110.5	2275.0	6.6	66.1
May 2003	5/15/03	15.1	95.0	31.5	5.8	44.1
May 2003		14.9	101.0	32.3	5.8	41.2
May 2003 Average		15.0	98.0	31.9	5.8	42.7
June 2003	6/11/03	4.9	18.9	2140.0	5.8	96.3
June 2003		5.3	16.4	2260.0	5.8	94.9
June 2003 Average		5.1	17.7	2200.0	5.8	95.6
July 2003	7/16/03	16.9	77.4	3270.0	5.7	55.1
July 2003		15.8	79.7	3680.0	5.7	55.7
July 2003 Average		16.4	78.6	3475.0	5.7	55.4
August 2003	8/7/03	14.8	79.7	78.7	5.5	63.7
August 2003		14.2	85.2	78.0	5.3	43.2
August 2003 Average		14.5	82.5	78.4	5.4	53.5
September 2003	9/10/03	11.2	53.3	406.0	5.3	51.7
September 2003		11.4	55.5	354.0	5.4	55.3
September 2003 Average		11.3	54.4	380.0	5.4	53.5
October 2003	10/8/03	16.3	73.9	87.1	6.2	34.3
October 2003		17.9	102.0	78.7	6.7	71.6
October 2003 Average		17.1	88.0	82.9	6.4	53.0
November 2003	11/5/03	16.0	60.1	111.0	5.1	34.8
November 2003		17.2	67.8	89.7	5.6	42.8
November 2003 Average		16.6	64.0	100.4	5.3	38.8
December 2003	12/10/03	15.5	64.7	28.9	4.6	15.5
December 2003		15.3	66.5	30.0	4.9	16.8
December 2003 Average		15.4	65.6	29.5	4.7	16.2
2003 Average		**16.2**	**74.3**	**728.5**	**5.7**	**66.2**
2003 STD		6.7	23.3	1177.7	0.6	42.7

Source: NPDES analytical data was obtained from 3M and summarized in this table.

PFHA - Perfluorohexanoic acid
STD - Standard Deviation
1- Averaged data taken from 8 data points.
2 - Averaged data taken from 3 data points.

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Table 4-11
Summary of NPDES FC Analytical Data - 2004

	Sample Date	Carboxylates		Sulfonates		
		PFHA (ppb)	PFOA (ppb)	PFBS (ppb)	PFHS (ppb)	PFOS (ppb)
January-04	1/14/04	0.57	1.60	0.70	0.23	0.82
January-04		0.67	1.74	0.72	0.25	0.80
January 2004 Average		**0.62**	**1.67**	**0.71**	**0.24**	**0.81**
February-04	2/4/04	12.6	127.0	30.7	3.3	38.4
February-04		11.8	102.0	28.3	3.4	28.7
February 2004 Average		**12.2**	**114.5**	**29.5**	**3.3**	**33.6**
March-04	3/3/04	15.9	73.3	31.2	2.4	13.3
March-04		16.9	75.9	36.5	1.9	18.8
March 2004 Average		**16.4**	**74.6**	**33.9**	**2.2**	**16.1**
April-04	4/7/04	4.1	8.9	26.3	0.2	2.0
April-04		4.5	9.5	34.1	0.3	2.0
April 2004 Average		**4.3**	**9.2**	**30.2**	**0.2**	**2.0**
May-04	5/5/04	9.1	36.8	130.0	1.0	5.9
May-04		8.9	34.3	134.0	1.0	6.1
May 2004 Average		**9.0**	**35.6**	**132.0**	**1.0**	**6.0**
June-04	6/2/04	19.3	2.5	776.0	0.2	0.9
June-04		17.9	2.5	721.0	0.2	1.2
June 2004 Average		**18.6**	**2.5**	**748.5**	**0.2**	**1.0**
July-04	7/14/04	14.7	81.1	844.0	2.6	16.3
July-04		13.3	73.4	1040.0	2.5	16.1
July 2004 Average		**14.0**	**77.3**	**942.0**	**2.5**	**16.2**
August-04	8/4/04	7.0	3.0	410.0	0.2	0.4
August-04		6.3	2.7	421.0	0.2	0.5
August 2004 Average		**6.7**	**2.9**	**415.5**	**0.2**	**0.4**
September-04	9/1/04	6.8	8.0	31.6	0.3	1.3
September-04		7.3	7.9	32.7	0.3	1.4
September 2004 Average		**7.0**	**8.0**	**32.2**	**0.3**	**1.3**
October-04	10/13/04	0.4	1.0	20.6	0.5	0.4
October-04		0.4	1.0	21.0	0.5	0.5
October 2004 Average		**0.4**	**1.0**	**20.8**	**0.5**	**0.4**
November-04	11/11/04	9.9	32.8	90.2	0.8	5.2
November-04		9.3	32.5	125.0	0.9	5.0
November 2004 Average		**9.6**	**32.7**	**107.6**	**0.9**	**5.1**
December-04	12/1/04	7.8	28.3	99.1	1.5	5.9
December-04		7.2	29.0	139.0	1.3	6.0
December 2004 Average		**7.5**	**28.7**	**119.1**	**1.4**	**6.0**
2004 Average		**8.9**	**32.4**	**217.7**	**1.1**	**7.4**
2004 STD		5.7	37.4	316.1	1.1	10.0

Source: NPDES analytical data was obtained from 3M and summarized in this table.

PFHA - Perfluorohexanoic acid
STD - Standard Deviation

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Table 4-12
Summary of NPDES FC Analytical Data - 2005

	Sample Date	Carboxylates		Sulfonates		
		PFHA (ppb)	PFOA (ppb)	PFBS (ppb)	PFHS (ppb)	PFOS (ppb)
January-05	1/12/05	7.8	19.2	96.1	1.5	1.5
January-05		7.5	20.0	80.9	1.1	1.6
January 2005 Average		**7.6**	**19.6**	**88.5**	**1.3**	**1.6**
February-05	2/3/05	13.4	22.2	75.1	1.9	3.5
February-05		14.0	23.8	72.3	1.9	4.1
February 2005 Average		**13.7**	**23.0**	**73.7**	**1.9**	**3.8**
March-05	3/10/05	21.1	262.0	145.0	2.8	7.3
March-05		20.7	264.0	151.0	3.0	7.8
March 2005 Average		**20.9**	**263.0**	**148.0**	**2.9**	**7.6**
April-05	4/7/05	14.4	26.1	186.5	2.8	4.0
April-05		13.9	24.7	167.0	2.8	4.1
April 2005 Average		**14.1**	**25.4**	**176.8**	**2.8**	**4.0**
May-05	5/5/05	4.7	4.3	276.0	2.6	2.4
May-05		4.8	4.3	308.0	2.5	2.1
May 2005 Average		**4.7**	**4.3**	**292.0**	**2.5**	**2.2**
June-05	6/9/05	6.5	41.9	161.0	3.0	9.7
June-05		6.6	48.0	158.0	3.2	9.7
June 2005 Average		**6.5**	**45.0**	**159.5**	**3.1**	**9.7**
July-05	7/6/05	5.7	46.7	43.6	2.4	15.6
July-05		5.9	42.4	50.7	2.3	13.7
July 2005 Average		**5.8**	**44.6**	**47.1**	**2.3**	**14.7**
August-05	8/18/05	5.7	32.0	12.3	1.8	8.5
August-05		6.0	28.4	11.0	1.8	9.1
August 2005 Average		**5.9**	**30.2**	**11.6**	**1.8**	**8.8**
September-05	9/15/05	0.4	1.2	7.8	0.6	0.4
September-05		0.4	1.2	7.7	0.6	0.4
September 2005 Average		**0.4**	**1.2**	**7.7**	**0.6**	**0.4**
October-05	10/6/05	0.8	1.9	7.4	0.4	0.5
October-05		0.8	1.9	7.4	0.4	0.5
October 2005 Average		**0.8**	**1.9**	**7.4**	**0.4**	**0.5**
November-05	11/2/05	5.8	66.6	26.8	2.2	8.9
November-05		5.5	52.5	25.8	2.2	8.4
November 2005 Average		**5.7**	**59.6**	**26.3**	**2.2**	**8.6**
December-05	12/7/05	1.2	0.9	32.6	1.1	0.4
December-05		1.2	0.9	35.0	1.1	0.5
December 2005 Average		**1.2**	**0.9**	**33.8**	**1.1**	**0.4**
2005 Average		**7.3**	**43.2**	**89.4**	**1.9**	**5.2**
2005 STD		6.1	71.9	88.2	0.9	4.6

Source: NPDES analytical data was obtained from 3M and summarized in this table.

PFHA - Perfluorohexanoic acid
STD - Standard Deviation

The most recent ranges of monthly average FC concentrations detected in 2005 are: PFOA – 0.9 to 263 ppb, PFOS – 0.4 to 14.7 ppb, PFHS – 0.4 to 3.1 ppb, and PFBS – 7.4 to 292 ppb.

4.4.2 Mississippi River

4.4.2.1 Sediment

In the Mississippi River, the highest average sediment concentrations of PFOS (8.28 ppb) and PFOA (13.2 ppb) were detected at sample location R3, which is adjacent to the operating plant portion of the 3M property. This was the only location at which PFBS and PFHS were detected. The following is a summary of the findings at the other sampling locations, which are shown in Figure 4-9:

- R1 and R2 – Average sediment concentrations of PFOA and PFOS were ND or not quantifiable (NQ).
- R4 - Average sediment concentrations of PFOA and PFOS were not quantifiable NQ.
- R5 – Average sediment concentrations of PFOA and PFOS were 1.13 and 6.13 ppb, respectively.
- R6 - Average sediment concentrations of PFOA and PFOS were ND and 1.35 ppb, respectively.

4.4.2.2 Surface Water

In the Mississippi River, PFOS and PFOA were ND or NQ at locations upgradient or adjacent to the operating plant (locations R1 to R4) as depicted in Figure 4-9. However, PFBS and PFHS were detected at location R2 adjacent to the plant with average concentrations of 0.050 and 0.077 ppb, respectively. The highest concentrations of FCs were detected at downstream location R5. The average detected PFOS, PFOA, and PFBS concentrations at this location were 0.098, 0.132, 0.097 ppb, respectively. The detected PFHS concentration at location R5 was NQ. Concentrations of FCs detected in the farthest downstream sample location R6 were NQ or ND.

4.5 MISSISSIPPI RIVER FISH

Summaries of FC concentrations in the fish whole body and filet tissue samples are provided in Tables 4-14 and 4-15. A copy of the analytical data packages (without appendices) is provided in Appendix D.

Tissue sample mass was limited for some whole body and filet samples from smaller bluegill sunfish and smallmouth bass specimens in the sample group necessitating analysis of 1 gram aliquots for these samples instead of 5 gram aliquots as stated in the FC Work Plan. Because recoveries of PFOA matrix spikes in the 1 gram aliquot fish samples were below acceptance criteria, PFOA results for these individual specimen samples are not reported (NR). In order to provide quantitative results representative of the sample types and locations, composite samples of the remaining tissue homogenate from each of these 17 fish samples were prepared from like species, sample type and location yielding 6 composite samples (see Table 4-13). Analyses of PFOA in the composite fish samples met acceptance criteria and are reported with the results of the individual fish tissue samples.

PFOA concentrations in whole body tissue samples from the upper reach (Reach 1) upstream of the 3M facility ranged from 0.881 ng/g (ppb) in a channel catfish sample to 1.52 ppb in a bluegill sunfish sample. PFOS concentrations in whole body tissue samples from Reach 1 ranged from 11.0 ng/g (ppb) in a channel catfish sample to 75.4 ppb in a bluegill sunfish sample. Filet tissue PFOA results for Reach 1 ranged from non-detect in all channel catfish samples and the bluegill sunfish composite sample to 0.972 ppb in a smallmouth bass filet tissue sample. PFOS concentrations in the Reach 1 samples ranged from 2.34 ppb in a channel catfish sample to 178 ppb in a smallmouth bass sample. Bluegill sunfish filet tissue samples from Reach 1 contained 30.3 and 32.3 ppb PFOS.

PFOA concentrations in whole body tissue samples from the middle reach (Reach 3) adjacent to the 3M facility ranged from 0.774 ppb in a channel catfish sample to 37.9 ppb in a bluegill sunfish sample. PFOS concentrations in whole body tissue samples from Reach 3 ranged from 12.6 ppb in a channel catfish sample to 9000 ppb in a bluegill sunfish sample. The other four bluegill sunfish whole body samples from this reach

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Table 4-13
Composite Fish Samples

Composite Sample ID and Description	Initial Sample ID
CGMN-F01-1LMFC-0-050812 Reach 1 Bluegill sunfish filet composite	CGMN-F01-1LMF01-0-050812 CGMN-F01-1LMF02-0-050812
CGMN-F01-3LMFC-0-050812 Reach 3 Bluegill sunfish filet composite	CGMN-F01-3LMF01-0-050812 CGMN-F01-3LMF02-0-050812
CGMN-F01-3MDFC-0-050812 Reach 3 Smallmouth bass filet composite	CGMN-F01-3MDF01-0-050812 CGMN-F01-3MDF02-0-050812 CGMN-F01-3MDF03-0-050812
CGMN-F01-5LMWC-0-050812 Reach 5 Bluegill sunfish whole body composite	CGMN-F01-5LMW01-0-050812 CGMN-F01-5LMW02-0-050812 CGMN-F01-5LMW03-0-050812 CGMN-F01-5LMW04-0-050812 CGMN-F01-5LMW05-0-050812
CGMN-F01-5LMFC-0-050812 Reach 5 Bluegill sunfish filet composite	CGMN-F01-5LMF01-0-050812 CGMN-F01-5LMF02-0-050812
CGMN-F01-5MDFC-0-050812 Reach 5 Smallmouth bass filet composite	CGMN-F01-5MDF01-0-050812 CGMN-F01-5MDF02-0-050812 CGMN-F01-5MDF03-0-050812

Table 4-14
Mississippi River - Summary of Whole Fish Analytical Results, ppb (wet weight)

Reach	Sample	Total Length, mm	Total Weight, g	PFOA, ng/g	PFOS, ng/g	PFBS, ng/g	PFHS, ng/g
1	*Channel catfish 1*	*195*	*54*	*0.810*	*18.3*	*0.734*	*ND*
1	*Channel catfish 2*	*343*	*256*	*0.971*	*32.2*	*0.564*	*ND*
1	*Channel catfish 3*	*445*	*600*	*1.00*	*17.0*	*ND*	*ND*
1	*Channel catfish 4*	*443*	*596*	*1.04*	*16.1*	*ND*	*ND*
1	*Channel catfish 5*	*550*	*1617*	*0.881*	*11.0*	*ND*	*ND*
1	Bluegill sunfish 1	124	44	1.52	46.8	3.63	ND
1	Bluegill sunfish 2	135	50	1.05	33.5	2.35	ND
1	Bluegill sunfish 3	120	37	1.03	75.4	2.33	ND
1	Bluegill sunfish 4	129	44	1.33	34.6	0.992	ND
1	Bluegill sunfish 5	120	32	1.07	34.5	0.500	ND
3	*Channel catfish 11*	*222*	*74*	*1.58*	*520*	*ND*	*2.11*
3	*Channel catfish 12*	*335*	*252*	*0.780*	*41.6*	*ND*	*ND*
3	*Channel catfish 13*	*330*	*250*	*1.10*	*17.6*	*ND*	*ND*
3	*Channel catfish 14*	*505*	*979*	*1.36*	*30.6*	*ND*	*ND*
3	*Channel catfish 15*	*552*	*1630*	*0.774*	*12.6*	*ND*	*ND*
3	Bluegill sunfish 8	142	64	37.9	9000	122	4.27
3	Bluegill sunfish 9	128	46	8.06	334	180	1.89
3	Bluegill sunfish 10	140	62	1.37	122	155	ND
3	Bluegill sunfish 11	132	57	1.18	65.4	2.90	ND
3	Bluegill sunfish 12	125	45	1.34	152	2	ND
5	*Channel catfish 21*	*562*	*1548*	*1.41*	*54.4*	*ND*	*ND*
5	*Channel catfish 22*	*397*	*481*	*1.93*	*126*	*ND*	*0.942*
5	*Channel catfish 23*	*568*	*1643*	*2.48*	*320*	*ND*	*1.05*
5	*Channel catfish 24*	*552*	*1440*	*2.54*	*125*	*ND*	*ND*
5	*Channel catfish 15*	*483*	*1100*	*2.30*	*39.9*	*ND*	*ND*
5	Bluegill sunfish 15	98	19	NR	367	*ND*	ND
5	Bluegill sunfish 16	122	40	NR	381	*ND*	ND
5	Bluegill sunfish 17	100	21	NR	629	*5.99*	ND
5	Bluegill sunfish 18	114	34	NR	562	*ND*	ND
5	Bluegill sunfish 19	100	20	NR	390	*24.0*	ND
5	Composite - Bluegill sunfish 15,16,17,18 & 19	NA	NA	0.600	NA	NA	NA

Notes:
Sample results reported on a wet weight basis
In instances where a sample and sample duplicate pair contain a numerical result and a non-detect result, the numerical value is presented.
NR = Not reported due to quality control result failures
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample)
NA = Not a target analyte for composite sample analyses

Table 4-15
Mississippi River - Summary of Fish Filet Analytical Results, ppb (wet weight)

Reach	Sample	Total Length, mm	Total Weight, g	PFOA, ng/g	PFOS, ng/g	PFBS, ng/g	PFHS, ng/g
1	*Channel catfish 6*	*750*	*4500*	*ND*	*2.97*	*ND*	*ND*
1	*Channel catfish 7*	*700*	*2800*	*ND*	*2.34*	*ND*	*ND*
1	*Channel catfish 8*	*540*	*1750*	*ND*	*4.02*	*ND*	*ND*
1	*Channel catfish 9*	*660*	*2500*	*ND*	*9.08*	*ND*	*ND*
1	*Channel catfish 10*	*562*	*1750*	*ND*	*11.7*	*ND*	*ND*
1	Smallmouth bass 1	387	692	0.948	178	ND	ND
1	Smallmouth bass 2	320	454	0.972	89.8	ND	ND
1	Smallmouth bass 3	231	178	0.856	19.0	ND	ND
1	Smallmouth bass 4	228	162	0.796	53.2	ND	ND
1	Smallmouth bass 5	230	166	0.904	45.0	ND	ND
1	Bluegill sunfish 6	180	155	NR	32.3	ND	ND
1	Bluegill sunfish 7	155	92	NR	30.3	ND	ND
1	Composite - Bluegill sunfish 6 & 7	NA	NA	ND	NA	NA	NA
3	*Channel catfish 16*	*625*	*2250*	*ND*	*8.54*	*ND*	*ND*
3	*Channel catfish 17*	*640*	*2600*	*ND*	*95.2*	*ND*	*ND*
3	*Channel catfish 18*	*700*	*3250*	*ND*	*5.60*	*ND*	*ND*
3	*Channel catfish 19*	*760*	*3500*	*ND*	*6.18*	*ND*	*ND*
3	*Channel catfish 20*	*640*	*3000*	*ND*	*10.7*	*ND*	*ND*
3	Smallmouth bass 6	160	63	NR	589	ND	ND
3	Smallmouth bass 7	227	175	NR	110	ND	ND
3	Smallmouth bass 8	222	175	NR	1320	ND	ND
3	Composite - Smallmouth bass 6,7 & 8	NA	NA	0.580	NA	NA	NA
3	Bluegill sunfish 13	145	65	NR	709	ND	ND
3	Bluegill sunfish 14	150	75	NR	69.7	ND	ND
3	Composite - Bluegill sunfish 13 & 14	NA	NA	3.21	NA	NA	NA
5	*Channel catfish 26*	*560*	*2000*	*0.622*	*69.2*	*ND*	*ND*
5	*Channel catfish 27*	*670*	*2500*	*ND*	*11.7*	*ND*	*ND*
5	*Channel catfish 28*	*680*	*3250*	*1.16*	*2.86*	*ND*	*ND*
5	*Channel catfish 29*	*672*	*3250*	*1.71*	*42.0*	*ND*	*ND*
5	*Channel catfish 30*	*620*	*2000*	*1.34*	*7.74*	*ND*	*ND*
5	Smallmouth bass 9	220	158	NR	290	3.33	ND
5	Smallmouth bass 10	250	274	NR	5150	ND	ND
5	Smallmouth bass 11	240	214	NR	884	ND	ND
5	Composite - Smallmouth bass 9,10 & 11	NA	NA	1.04	NA	NA	NA
5	Bluegill sunfish 20	140	72	NR	331	ND	ND
5	Bluegill sunfish 21	139	69	NR	330	ND	ND
5	Composite - Bluegill sunfish 20 & 21	NA	NA	0.504	NA	NA	NA

Notes:
Sample results reported on a wet weight basis
In instances where a sample and sample duplicate pair contain a numerical result and a non-detect result, the numerical value is presented.
NR = Not reported due to quality control result failures
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample)
NA = Not a target analyte for composite sample analyses

contained PFOS at concentrations ranging from 55.4 and 334 ppb. Filet tissue PFOA results for Reach 3 included non-detect for all channel catfish samples, 0.58 ppb in the smallmouth bass filet composite sample and 3.21 ppb in the bluegill sunfish filet composite sample. PFOS concentrations in Reach 3 filet tissue samples ranged from 5.60 ppb in a channel catfish sample to 1320 ppb in a smallmouth bass sample. PFOS concentrations in bluegill sunfish filet tissue samples from Reach 3 were 59.7 and 709 ppb.

PFOA concentrations in whole body tissue samples from the lower reach (Reach 5) downstream from the 3M facility were 1.41 to 2.54 ppb in the channel catfish whole body samples and 0.600 ppb in the bluegill sunfish whole body composite sample. PFOS concentrations in whole body tissue samples from Reach 5 ranged from 39.9 ppb in a channel catfish sample to 629 ppb in a bluegill sunfish sample. Filet tissue PFOA results for Reach 5 included non-detect to 1.71 ppb in channel catfish samples, 0.504 ppb in the bluegill sunfish filet composite sample and 1.04 ppb in the smallmouth bass filet composite sample. PFOS concentrations in Reach 5 filet samples ranged from 2.86 ppb in a channel catfish sample to 5150 ppb in a smallmouth bass sample. PFOS concentrations in bluegill sunfish filet tissue samples from Reach 5 were 331 and 330 ppb.

5. REVIEW OF DOCUMENTATION ON HISTORICAL WASTE DISPOSAL SITES

5.1 FILE REVIEW

A file review was conducted by WESTON in January and April of 2005. In accordance with the FC Work Plan, this review was conducted to collect information on the historic 3M Cottage Grove facility waste generation, waste disposal, or treatment both on-site and off-site.

In January 2005, WESTON reviewed 3M files for the Cottage Grove facility. Subsequently, in March 2005, WESTON requested from the MPCA a list of archived files and the size of active (nonarchived) files for the following sites: Washington County Landfill, 3M Chemolite/Cottage Grove facility, 3M Oakdale Site, Woodbury Site, Kerrick (Pine County Landfill), and the Commercial Chemical/Pollution Control, Inc. (PCI) facilities. In April 2005, WESTON reviewed MPCA and 3M files for these sites. Documents that WESTON tagged for review included those that could possibly provide information on waste generation and disposal or treatment. These included regulatory correspondence, permits, site assessment reports, site remediation reports, site closure reports, personal notes, site drawings, sketches, etc.

The findings from the file review, relative to the off-site waste disposal locations utilized by the Cottage Grove facility were submitted to the MPCA during a June 10, 2005 meeting at their offices. Table 5-1 is a summary of the findings regarding the waste disposal locations utilized by Cottage Grove. Following the meeting, 3M and WESTON had a conference call with MPCA on June 13, 2005 regarding additional information that had been obtained on the Commercial Chemical Company/Pollution Controls, Inc. (PCI) sites in Newport, Minnesota and Savage, Minnesota. This additional information/ documentation showed that FC-related wastes were not disposed at either of these locations and that all FC-related wastes for the time period of interest (i.e. 1960-1971) were either disposed at the Woodbury Site or on-site.

Table 5-1
Off-Site Waste Disposal Locations - 3M Cottage Grove, Minnesota

Facility ID	Waste Disposed	Est. Period of Use	Priority for Investigation	Comments
Oakdale Site	Liquid and solid industrial waste	1956-1960	High	Investigation underway
Woodbury Site	Liquid and solid industrial waste	1960-1966	High	FC wastes remain buried at the site
Great Northern Oil Co plant, in Bruno, MN	Wastewater/ phenol waste	1965	Low	Waste was not FC-related
Kerrick Site, Pine County, MN*	Liquid and solid industrial waste	1967 & 1969	Low	Low waste volume was disposed in this area and this volume has been removed and incinerated
Commercial Chemical Company in Newport, MN (incinerator)	Wet scrap	1960-1962 (pick up of solvent) 1962-1964 (incineration)	Medium	FC-wastes may have been managed at this facility
Commercial Chemical Company/Pollution Control, Inc. in Savage, MN (incinerator)	Wet scrap	1964-1971	Medium	FC-wastes may have been managed at this facility
Pig's Eye Dump	Dry scrap; burned out drums and inert ash from Chemolite incinerator	1971	Low	Pigs Eye primarily was used for dry scrap disposal and one-time disposal of incinerator residue from July 1971 to December 1971
Washington County Landfill (Lake Jane Landfill)	WWTP sludge, incinerator scrubber sludge, iron oxide sludge, and ash from quench chamber of incinerator	1971-1974	High	Investigation underway
Pine Bend Landfill, IGH, MN - BFI (aka Phoenix) Former NPL Site	WWTP sludge and boiler ash	Mid 1970s/ Early 1990s	Medium	WWTP sludge was managed at this facility.
Anoka County (*Uncertain of other names*)	WWTP sludge	1980s	Medium	WWTP sludge may have been managed at this facility.
Rosemount - SKB (USPCI/Laidlaw) (3-4 mi away from Pine Bend)	WWTP sludge and nonhazardous industrial waste from demolition of old incinerator in 2002	Mid 1990s to mid-2003	Medium	WWTP sludge was managed at this facility.
Superior FCR - ONYX Buffalo, MN	WWTP sludge	Mid-2003 to present	Low	WWTP sludge was disposed at this facility after cessation of FC production.

*Materials recovered and brought back to incinerator for disposal

E:\FOLDERS.0-9\3m-cottage grove\FC Data Assessment Report\Table 5-1 - Off Site Waste Disposal Locations (Semiannual Rept).XLS

5.2 INTERVIEWS WITH FACILITY PERSONNEL

WESTON interviewed current and former 3M employees in the winter and spring of 2005 to corroborate and supplement the information collected from the file review on the historic 3M Cottage Grove facility waste generation, waste disposal, and treatment.

A new item discussed during the facility personnel interviews was the possible existence of a former on-site sludge disposal pit, which was operated prior to the D2 – Former Sludge Disposal Area. No documentation of this pit was evident in the file review and it has not been assessed. It is uncertain when operations at the former sludge disposal pit started. This former on-site sludge disposal pit has now been designated as D9.

6. DATA ASSESSMENT AND IDENTIFICATION OF DATA NEEDS

The following sections provide an overview, by medium, of the results and observations of the 3M Cottage Grove facility FC assessment. The overview is followed by a description of additional data needs, where they have been identified.

6.1 GROUNDWATER

Cottage Grove Facility – It was found that the groundwater analytical data collected from 2003 to 2005 under the LOI program were consistent with the groundwater data collected under this FC assessment.

No FCs were detected in the water sample collected from the Building 116 cafeteria tap. The water at this location is treated with granular activated carbon prior to use.

The highest FC concentrations were detected in groundwater samples from monitoring wells MW-12 downgradient of the D5 – Former Solids Burn Pit Area, MW-14 downgradient of the D8 – Former Waste Disposal Area, and MW-101 downgradient of the D1 – Former HF Tar Neutralization Pit. In these areas, PFOA concentrations ranged from 150 to 1,863 ppb and PFOS from 80 to 324 ppb. Compared to the PFOA concentrations detected in groundwater samples from monitoring wells MW-12 and MW-14, lower concentrations of PFOA were detected in the groundwater samples from monitoring wells MW-101 and MW-102 at the D1 Area.

The highest FC concentrations detected in groundwater samples collected from pumping wells were detected at pumping well PW-6 (155 ppb PFOA). PW-6 is downgradient of the D8 Area. Groundwater elevation data collected from the monitoring wells in March 2005 show that the influence of the pumping wells is most significant in the central plant area and is reduced with increasing distance from this area.

With respect to groundwater at the 3M Cottage Grove facility, the following data needs have been identified:

- The file review and personnel interviews indicated that there may be a former sludge disposal pit (D9), which had not been assessed previously. This is located between the wastewater treatment plant and the D2 Area and will be referred to as the D9 Area. Groundwater quality and movement in the area of the D9 former sludge disposal pit has not been characterized.

- The potential movement of groundwater to surface water, particularly downgradient of the D8, D5 and D2 Areas, has not been characterized.

Woodbury Site: Of the four pumping wells at the Woodbury Site, pumping well R4 contained the highest FC concentrations (19.7-23.3 ppb PFHS, 5.72-11 ppb PFBS, 2.78-3.12 ppb PFOA and 1.83-2.29 ppb PFOS). This well has the highest pumping capacity and is the closest pumping well to the main disposal area. At pumping wells R1 and R3, detected concentrations of PFBS and PFHS ranged from 0.337 to 3.47 ppb and 1.03 to 2.61 ppb, respectively. PFOA and PFOS were detected in these wells at concentrations ranging from 0.153 to 2.33 ppb and 0.0562 to 0.144 ppb, respectively. No FCs were detected at pumping well R2, which is located farthest from the main disposal area. FCs were detected in the pumping well combined discharge at comparable concentrations to the discharge from the Cottage Grove non-contact process water retention pond. This indicated that additional FCs were not introduced to the water pumped from the Woodbury Site as it was used at the Cottage Grove plant. Thus, the pumping wells at the Woodbury Site have been characterized and no further assessment of the Woodbury Site appears to be warranted at this time.

6.2 SOIL

The highest concentrations of FCs in soils were found in the D2 and D1 Areas. In the D2 – Former Sludge Disposal Area, the highest FC concentrations (up to 12,350 ppb PFOS[1]) were found in the sludge. Lower concentrations (ranging from 4.39 to 794 ppb PFOS) were detected in the underlying native soil, which occurs below approximately 20 to 25 ft bgs. PFOS generally is found at higher concentrations than PFOA in the 0 to 25 ft bgs soil (sludge) samples. It was also found at higher concentrations (1,195 and 1,625 ppb) at a surface soil location downgradient of this area. PFOA generally is found at higher concentrations than PFOS at the lower depth intervals from 25 to 50 ft bgs in the native

[1] For reference, the Minnesota Department of Health (MDH) has established Soil Reference Values for industrial sites of 200,000 ug/kg (ppb) PFOA and 40,000 ppb PFOS.

soils underlying the D2 Area. The highest concentration of PFHS (1,550 ppb) detected in soils at the site was found in the D2 sludge at the 15 to 20 ft bgs depth interval.

In the D1 – Former HF Tar Neutralization Pit Area, the highest FC concentrations (up to 4,520 ppb PFOA) were detected in soils from the borings outside the pit in the 5 to 30 ft bgs depth range in borings constructed just outside the location of the pit structure and decreased below 30 ft bgs in the native soils (ranging from 53.9 to 375 ppb). PFOA generally was detected at higher concentrations than PFOS in the borings from this area.

In the D5 – Former Solids Burn Pit Area, concentrations of PFOS (up to 2,310 ppb) and PFOA (up to 1,375 ppb) were detected in soil samples to a depth of approximately 15 ft bgs in the one soil boring constructed in this area. Lower concentrations (34.5 and 46.8 ppb PFOS and 21.8 and 42.5 ppb PFOA) were detected at lower depths. Some gravel, ash, and charcoal were noted in the boring log for soils a 6 to 14 ft bgs indicating that this boring encountered the previous D5 activities (i.e., burning) Surface soil samples collected downgradient of this area generally contain lower FC concentrations, which suggest that potential surface transport via erosion is not significant.

In the D8 – Former Waste Disposal Area, concentrations of PFOA (up to 543 ppb)and PFOS (up to 983 ppb) were detected in subsurface soils to a depth of 15 ft bgs and at a surface soil sample location downgradient of this area. The soil descriptions did not indicate any observation of waste material, discoloration, or odors.

At the Fire Training Area, PFOS was detected at concentrations up to 1,820 ppb primarily in shallow soils to a depth of 5 ft bgs, with significantly lower concentrations detected at lower depths. It is noted that the area around boring FTA-03 has been substantially altered with the construction of a new run-off control basin.

At the Building 15 (location of the former electrochemical fluorination cells) Area, PFOS was detected at concentrations up to 833/904(duplicate) ppb in shallow soils (0–5 ft bgs) and 1,865 ppb at a depth of 20 to 25 ft bgs. At the Former Wastewater Pond, PFOS was detected at a concentration of 805 ppb at a depth of 15 to 20 ft bgs. A strong odor and higher TOC level was noted for the 15 to 25 ft bgs interval in the former wastewater pond boring; however, no visual indication of residue or waste material was noted.

Surface soil samples (0-6 and 6-24 in bgs) collected in the vicinity of buildings where FCs were managed (Buildings 7, 16, and 25) generally indicated higher concentrations of FCs than samples collected in the vicinity of buildings where FCs were not managed (Buildings 22, 102, and 112), the incinerator complex, and the D6 – Former Ash Disposal Area.

The following data needs have been identified for soils at the 3M Cottage Grove facility:

- D5 – Former Solids Burn Pit Area. This area, which is approximately 2 acres in size, has not been defined with respect to the horizontal extent and concentrations of FCs. Historic records and information did not show a distinct limit for D5 but only a general area. Only one boring was located in this area and soil samples from this boring exhibited concentrations of FCs primarily at 0 to 15 ft bgs.
- D8 – Former Waste Disposal Area. Due to access issues, this area is not defined with respect to the horizontal extent of any remaining waste burial, which was not previously removed.
- D9 - Former Sludge Disposal Pit. This newly identified area has not been assessed or characterized and will be referred to as the D9 Area.

6.3 SEDIMENT AND SURFACE WATER

Sediment - FCs were detected in sediment. Generally, upstream levels were less than downstream.

PFOA sediment concentrations in the east cove (11.7 to 28.7 ppb) are comparable to the west cove (4.11 to 38.7 ppb). PFOS sediment concentrations in the east cove (24.2 to 267 ppb) are higher than at the west cove (15.2 to 91.1 ppb). Higher PFOS concentrations were detected in the shallow sediments (0-10 cm) of the east cove than in the deeper sediments (10-20 cm).

In the Mississippi River, average sediment concentrations at sample locations R1, R2, and R4 were NQ or ND. Average sediment concentrations of 8.28 ppb PFOS and 13.2 ppb PFOA were detected at sample location R3, which is adjacent to the operating plant portion of the property. This was the only location where PFBS and PFHS were detected.

Surface Water - The average concentrations of FCs in the east cove water sample were greater than the concentrations detected in the west cove water sample. In the Mississippi River, PFOA and PFOS concentrations were ND or NQ at the R1 through R4 sampling locations. The only quantifiable levels of PFOS and PFOA (0.098 and 0.132 ppb, respectively) in the water samples were detected at downstream location R5.

Regarding the NPDES data, it is evident that the concentrations of FCs in the site have decreased treated wastewater discharge significantly since 2000.

With respect to sediment and surface water, the following data needs have been identified:

- Concentrations, if any, of FCs in groundwater entering the river (pore water) are not known.
- Distribution, if any, of FCs in surface waters and sediment extending across the river are not known.

6.4 MISSISSIPPI RIVER FISH

The analytical results indicate that FCs have been detected in fish samples (whole body and filet) collected from three reaches of the Mississippi River in the immediate vicinity of the Cottage Grove facility. The FCs were detected in each of the three species sampled: Channel catfish, Bluegill sunfish, and Smallmouth bass.

The following conclusions have been identified for the Mississippi River fish:

- The current data set represents one limited round of fish sampling conducted in the Mississippi River.
- Pending analytical work being performed on additional fish samples by the MPCA, further discussions may be warranted relative to additional data needs.

7. RECOMMENDATIONS FOR THE FUTURE COURSE OF ACTION

Substantial characterization has been completed at the 3M Cottage Grove facility as part of the work conducted in 2005. However, data needs (additional information that will be useful for assessment) were identified and should be addressed in order to define the most effective path forward. These additional field activities are presented in the following recommendations.

Groundwater

- Based on accessibility, install a total of three to five groundwater monitoring wells, if feasible (based on physical constraints and access considerations), downgradient of the D2 and D5 areas toward the river.
- Install two to three groundwater monitoring wells around the perimeter of the Former Sludge Disposal Pit (D9 Area) to determine groundwater quality and flow direction.
- Define the hydraulic capture and effect of pumping wells PW5 and PW6 by collecting water level and drawdown data from existing monitoring wells. This may be coordinated with a planned shutdown of PW-6 in early May due to incinerator maintenance.

Soil

- D5 – Former Solids Burn Pit Area. Install an additional three to five soil borings to 25 ft bgs to further characterize the extent of FCs in this area.
- D8 – Former Waste Disposal Area. Review information on past survey and remediation activities conducted in this area. Based on a review of this information and accessibility, determine if a geophysical survey would be necessary to further define the horizontal extent of any remaining waste burial at this location.
- D9 - Former Sludge Disposal Pit. Install two to four soil borings to 25 ft bgs to characterize the extent of FCs, if any, in this area.

Pore Water/Surface Water/Sediment

- Collect pore water samples using shallow hand-driven well points at approximately 25 locations in the Mississippi River along the facility shoreline to assess possible groundwater discharge through bottom sediments and into the river.
    - 20 equally spaced sampling locations along approximately 4,000 ft of shoreline between the D8 Area and the east cove. These sampling locations will be established based on the results of a flow net analysis to estimate zone of groundwater discharge to the river.
    - Five locations in the reach between the west cove and monitoring well MW-14 to detect any groundwater discharge.
- Collect paired surface water/sediment samples at the following sampling locations:
    - Pore water sampling locations (25 samples).
    - East and west coves and associated drainageways (up to 6 samples).
- Collect surface water samples along a transect across the Mississippi River in Reach 3/5 area (estimate 10-15 sampling nodes).

Fish/Aquatic Biota

- Review pending MPCA fish sampling results. Discuss with MPCA, Minnesota Department of Health (MDH), Minnesota Department of Natural Resources (MDNR) plans for additional fish sampling in the river to determine the path forward.

Table 7-1 provides a summary of the recommended Phase 2 FC assessment, which would be performed under the existing HASP and FC Work Plan. Pending approval of this Data Assessment Report by the MPCA, the anticipated schedule for major elements of the Phase 2 assessment includes:

- MPCA approval of the Data Assessment Report – April/May 2006.
- Field work , data analysis, and compilation – May to September 2006
- Interim Progress Report – September 2006.
- Phase 2 FC Data Assessment Report - December 2006.

Figure 7-1 provides a bar chart which shows anticipated performance and completion of individual activities for the Phase 2 assessment program.

Table 7-1
Summary (by Media) of the Phase 2 FC Assessment
3M Cottage Grove, MN Facility

Media	No. of Samples/Locations/Description of Activity
1. Groundwater (Up to 8 samples*)	a. Install 3 to 5 groundwater monitoring wells downgradient of D2 and D5. Collect up to 5 groundwater samples. b. Install 2 to 3 groundwater monitoring wells around the perimeter of the Former Sludge Disposal Pit (D9 Area). Collect up to 3 groundwater samples. c. Conduct hydraulic study of pumping wells PW-5 and PW-6 which will be coordinated with the upcoming scheduled shutdown of PW-6 for incinerator maintenance.
2. Soil (Up to 45 samples*)	a. Up to 45 sub-surface soil samples collected from 5 to 9 soil borings as follows: – Up to 25 soil samples at D5 Area - Former Solids Burn Pit Area. One composite soil sample for each 5 ft interval (3 to 5 borings to 25 ft). – Up to 20 soil samples at D9 Area - Former Sludge Disposal Pit. One composite soil sample for each 5 ft interval (2 to 4 borings to 25 ft). b. Based on a review of past information and accessibility constraints,determine if a geophysical survey of the D8 - Former Waste Disposal Area would be necessary.
3. Pore Water (Approx. 25 samples*)	a. 25 pore water samples in the Mississippi River as follows: – Conduct groundwater flow net analysis to locate pore water stations. – 20 water samples between the D8 Area and the east cove. – 5 water samples in the reach between the west cove and MW-14.
4. Surface Water (At least 46 samples*)	a. At least 46 surface water samples collected as follows: – 25 surface water samples at pore water sampling locations (paired with sediment) in the Mississippi River. – Up to 6 surface water samples at the east and west coves and associated drainageways (paired with sediment). b. Up to 15 surface water samples along a transect across the Mississippi River in Reach 3/5 area.
5. Sediment (At least 31 samples*)	a. At least 31 sediment samples collected as follows: – 25 sediment samples at pore water sampling locations (paired with surface water) in the Mississippi River. – Up to 6 samples at the east and west coves and associated drainageways (paired with surface water).

* Actual number will be based upon conditions encountered in the field.

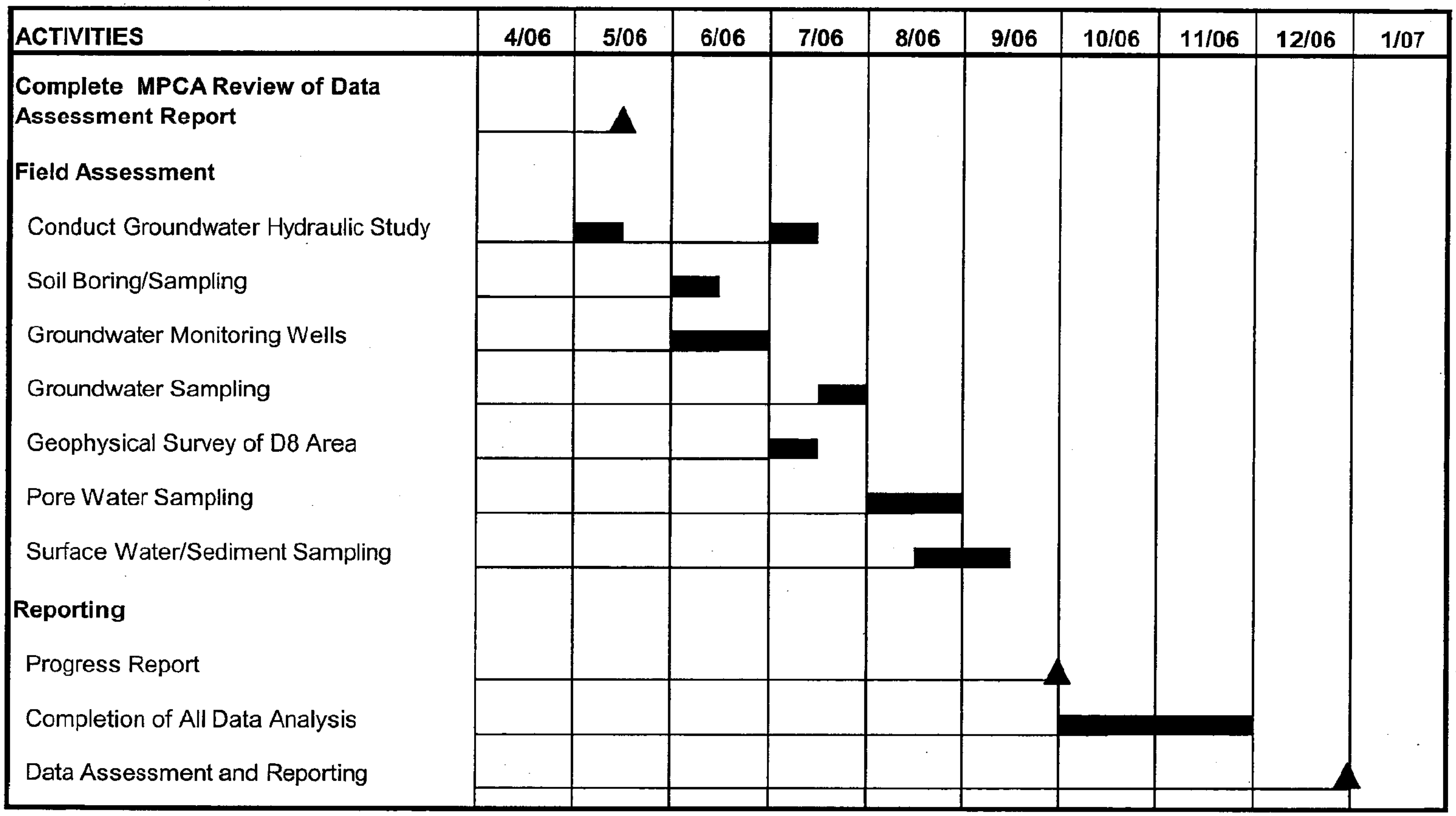


FIGURE 7-1 SCHEDULE FOR THE PHASE 2 FC ASSESSMENT
3M COTTAGE GROVE, MN

8. REFERENCE

Lindholm, G.F., Helgensen, J.O., Broussard, W.L, and Farrell, D.F. 1974. *Water Resources of the Lower St. Croix River Watershed, East-Central Minnesota. Hydrologic Investigations Atlas HA-490; U.S. Geological Survey.* Reston, Virginia.

www.co.washington.mn.us Website containing county land use and demographic information.

APPENDIX A
WELL EVACUATION/SAMPLING FORMS

3MA01551898

Confidential Client – Co[illegible] Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 15 -16 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-01	Weather: Sunny Cloudy Rain Temp: 20°F
Sampling Team: KS / WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO Cut lock off	Well Diameter: 6 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	92.67 (KS)	~~200.00~~	Well Evacuation Method ( ) BAILER ( ) 2-Inch Grundfos (KS) ✓ 4-Inch Grundfos ( ) Other (Specify)
B. Depth to Water (DTW) (TOC):		- 67.71	
C. Column of Standing Water (C=A-B):	13.23	~~24.96~~	
D. Purge Factor		x 1.47	
E. One Well Volume:	19.45	~~36.69~~	(KS)
F. Three Well Volumes (gallons):	58.34	~~110.07~~	TOTAL VOLUME PURGED: ~~112~~ 585 gallons (KS)

INDICATOR PARAMETERS

	3-15-05					3-16-05			
Time	1427	1430	1433	1436	1439	0835	0855	0915	0935
Gallons Purged	2	21	43	65	80	180	380	470	580
Temperature (°C):	9.94	9.92	9.99	10.01	10.00	10.07	10.09	9.94	10.00
Specific Conductivity (s):	613	669	683	689	695	680	702	711	710
Dissolved Oxygen (mg/L):	1.90	1.27	1.37	1.57	1.64	7.24	2.23	2.13	2.17
pH:	6.52	7.41	7.54	7.31	7.34	7.67	7.53	7.57	7.55
Visual Turbidity (L, M, H):	m	m	m	m	m	m	m	m	m

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 3/16/05

Sample No.	Time	Sample No.	Time
Media Sample ID:	10:30	Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Lock removed with bolt cutters, Total Depth verified to 92.67 not 200 feet, Initial Purge of 112 gallons on 3-15-05; Final Purge of remaining 471 gallons on 3-16-05, Total Purged 585 gallons

Well Pumped Dry: YES / NO
Previous Volume Purged: 185 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551899

Confidential Client – Cot. ,e Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-02

Weather: Sunny Cloudy Rain Temp: 15 F

Sampling Team: WW / KS / AM

Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged

Concrete Base: Intact / Damaged

Locked: YES / NO

Well Diameter: 6 inch.

WELL EVACUATION INFORMATION 920 WW

A. Total Depth (Top of Casing = TOC):	192.00	
B. Depth to Water (DTW) (TOC):	- 85.91	
C. Column of Standing Water (C=A-B):	6.09	
D. Purge Factor	x 1.47	
E. One Well Volume:	8.95	
F. Three Well Volumes (gallons):	26.85	

Well Evacuation Method
( ) BAILER
(✓) 2-Inch Grundfos
( ) 4-Inch Grundfos
( ) Other (Specify)

TOTAL VOLUME PURGED: 8

INDICATOR PARAMETERS

Time	1050	1055							
Gallons Purged	2	8							
Temperature (°C):	9.14	9.61							
Specific Conductivity (s):	556	579							
Dissolved Oxygen (mg/L):	1.06	1.17							
pH:	7.74	7.65							
Visual Turbidity (L, M, H):	L	L							

NAPL Observed: YES / NO

Well Pumped Dry: YES / NO

ODOR: YES / NO

Other:

Odor Type: ( ) Solvent ( ) Septic ( ) Other

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

BOLT CUTTERS, REMOVED LOCK TO GAIN ACCESS

Well Pumped Dry: YES / NO
Previous Volume Purged: 65 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551900

Confidential Client – Cott Grove, Minnesota
WESTON W.O.: 02181-0..-010-0001

DATE: 16 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-03	Weather: Sunny Cloudy Rain Temp: 23°F
Sampling Team: KJ/AM/WW/TP	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 6 inch.

WELL EVACUATION INFORMATION

196.75

A. Total Depth (Top of Casing = TOC):	210.00	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 99.40	( ) BAILER
C. Column of Standing Water (C=A-B):	97.35	( ) 2-Inch Grundfos
D. Purge Factor	x 1.47	(✓) 4-Inch Grundfos
E. One Well Volume:	143.10	( ) Other (Specify)
F. Three Well Volumes (gallons):	429.31	TOTAL VOLUME PURGED:________

INDICATOR PARAMETERS

Stop pump Start pump

Time	0913	0935	0953	1055	1114	1123	1132	
Gallons Purged	0	110	220	~~330~~ 220	330	385	440	
Temperature (°C):	10.39	10.80	10.79	10.82	10.82	10.81	10.80	
Specific Conductivity (s):	861	772	745	732	732	747	745	
Dissolved Oxygen (mg/L):	8.50	9.98	9.17	10.96	10.96	9.89	9.68	
pH:	7.48	7.39	7.34	7.31	7.31	7.29	7.29	
Visual Turbidity (L, M, H):	L	L	L	L	L	L	L	

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:________

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

LOCK REMOVED WITH BOLT CUTTERS, UNABLE TO LOCK

Well Pumped Dry: YES / NO
Previous Volume Purged: 130 gallons
Well Requires Maintenance? YES NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551901

Confidential Client – Cot   Grove, Minnesota
WESTON W.O.: 02181-0..-010-0001

DATE: 16 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-04	Weather: Sunny Cloudy Rain Temp: 32 °F
Sampling Team: TF / AM	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 6 inch.

WELL EVACUATION INFORMATION

133.20

A. Total Depth (Top of Casing = TOC):	200.00	Well Evacuation Method ( ) BAILER ( ) 2-Inch Grundfos (✓) 4-Inch Grundfos ( ) Other (Specify)
B. Depth to Water (DTW)(TOC):	- 108.25	
C. Column of Standing Water (C=A-B):	91.75	
D. Purge Factor	x 1.47	
E. One Well Volume:	134.87	
F. Three Well Volumes (gallons):	406	TOTAL VOLUME PURGED: 425

INDICATOR PARAMETERS

Stop Pump Start Pump

Time	1246	1304	1323	1405	1423	1433	1440		
Gallons Purged	0	110	280	START	330	385	420		
Temperature (°C):	9.98	13.17	13.20		13.30	13.27	13.30		
Specific Conductivity (s):	1054	1047	1068		1071	1074	1074		
Dissolved Oxygen (mg/L):	9.51	12.01	12.43		12.43	12.43	12.43		
pH:	7.42	7.13	7.12		7.15	7.15	7.12		
Visual Turbidity (L, M, H):	L	L	L						

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M)   John Flaherty
Phone: 651-778-5352   814-231-8032

COMMENTS

LOCK REMOVED W/ BOLT CUTTERS

Well Pumped Dry: YES / NO
Previous Volume Purged: 112 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551902

Confidential Client – Cot[illegible] Grove, Minnesota
WESTON W.O.: 02181-[illegible]-010-0001

DATE: 16 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-05	Weather: Sunny Cloudy Rain Temp: 28
Sampling Team: KS/WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO cut lock off	Well Diameter: 6 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~210.80~~ 208.70	Well Evacuation Method ( ) BAILER ( ) 2-Inch Grundfos (✓) 4-Inch Grundfos ( ) Other (Specify)
B. Depth to Water (DTW) (TOC):	- 51.57	
C. Column of Standing Water (C=A-B):	157.13	
D. Purge Factor	x 1.47	
E. One Well Volume:	230.98	
F. Three Well Volumes (gallons):	692.94	TOTAL VOLUME PURGED: 695

INDICATOR PARAMETERS

Time	1055	1115	1130	1159	1235	1255			
Gallons Purged	2	170	360	460	560	695			
Temperature (°C):	9.86	9.88	9.84	9.70	9.68	9.71			
Specific Conductivity (s):	713	716	714	714	718	705			
Dissolved Oxygen (mg/L):	2.45	2.64	3.16	2.57	2.62	2.66			
pH:	7.65	7.62	7.68	7.72	7.70	7.65			
Visual Turbidity (L, M, H):	L	L	L	L	L	L			

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 3/16/05

Sample No.	Time	Sample No.	Time
Media Sample ID:	16:00	Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

LOCK REMOVED W/ BOLT CUTTERS

Well Pumped Dry: YES / NO
Previous Volume Purged: 227 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551903

Confidential Client – Co[illegible] Grove, Minnesota
WESTON W.O.: 02181-[illegible]-010-0001

DATE: 15 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-06	Weather: Sunny Cloudy Rain Temp: 35° F
Sampling Team: KS / WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact Damaged
Locked: YES / NO	Well Diameter: 6 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~219.00~~ 103.20 (WW)	Well Evacuation Method ( ) BAILER ( ) 2-Inch Grundfos (✓) 4-Inch Grundfos ( ) Other (Specify)
B. Depth to Water (DTW) (TOC):	- DRY	
C. Column of Standing Water (C=A-B):		
D. Purge Factor	X 1.47	
E. One Well Volume:		
F. Three Well Volumes (gallons):		TOTAL VOLUME PURGED:

INDICATOR PARAMETERS

Time										
Gallons Purged										
Temperature (°C):										
Specific Conductivity (s):										
Dissolved Oxygen (mg/L):										
pH:										
Visual Turbidity (L, M, H):										

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals (X) pH (X) Specific Conductance (X) Temperature ( ) ( ) ( )	Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032

COMMENTS

LOCK WAS REMOVED WITH BOLT CUTTERS * WELL DRY @ 103.20', UNABLE TO PURGE + SAMPLE	Well Pumped Dry: YES NO Previous Volume Purged: 160 gallons Well Requires Maintenance? YES / NO Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client – Co[illegible] Grove, Minnesota
WESTON W.O.: 02181-0[illegible]2-010-0001

DATE: 16 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-07	Weather: Sunny Cloudy Rain Temp: 34°
Sampling Team: KS, AM, BW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO (WW)	Well Diameter: 6 inch.

WELL EVACUATION INFORMATION 140.24 am

A. Total Depth (Top of Casing = TOC):	~~146.00~~	Well Evacuation Method ( ) BAILER ( ) 2-Inch Grundfos (X) 4-Inch Grundfos ( ) ~~Other (Specify)~~
B. Depth to Water (DTW) (TOC):	- 55.07	
C. Column of Standing Water (C=A-B):	85.17	
D. Purge Factor	x 1.47	
E. One Well Volume:	125.19	
F. Three Well Volumes (gallons):	375.6	TOTAL VOLUME PURGED:

INDICATOR PARAMETERS

Time	1405	1420	1426	1431	1439	1445			
Gallons Purged	4	125	200	265	320	375			
Temperature (°C):	9.78	9.90	9.90	9.86	9.90	9.88			
Specific Conductivity (s):	575	577	578	577	578	578			
Dissolved Oxygen (mg/L):	1.07	0.62	0.61	0.61	0.61	0.61			
pH:	7.63	7.31	7.31	7.26	7.29	7.26			
Visual Turbidity (L, M, H):	L	L	L	L	L	L			

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 3/16/05

Sample No.	Time	Sample No.	Time
Media Sample ID:	16:35	Rinsate Blank: YES / NO	
		ID NO.:	

Parameters:
( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH 7.26
(X) Specific Conductance 578
(X) Temperature 9.88
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

LOCK REMOVED W/ BOLT CUTTERS

Well Pumped Dry: YES / NO
Previous Volume Purged: 115 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client – Cot Grove, Minnesota
WESTON W.O.: 02181-0..-010-0001

DATE: 16 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-08

Weather: Sunny Cloudy Rain Temp:

Sampling Team:

Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged

Concrete Base: Intact / Damaged

Locked: YES / NO

Well Diameter: 6 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~173.00~~ 172.45 (ww)	
B. Depth to Water (DTW) (TOC):	- 66.02	
C. Column of Standing Water (C=A-B):	106.43	
D. Purge Factor	X 1.47	
E. One Well Volume:	156.45	
F. Three Well Volumes (gallons):	469.35	

Well Evacuation Method
( ) BAILER
( ) 2-Inch Grundfos
(✓) 4-Inch Grundfos DESIGNATED
( ) Other (Specify)

TOTAL VOLUME PURGED:

INDICATOR PARAMETERS

Time									
Gallons Purged									
Temperature (°C):									
Specific Conductivity (s):									
Dissolved Oxygen (mg/L):									
pH:									
Visual Turbidity (L, M, H):									

NAPL Observed: YES / NO

Well Pumped Dry: YES / NO

ODOR: YES / NO

Other:

Odor Type: ( ) Solvent ( ) Septic ( ) Other

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time
Media Sample ID:	

Sample No.	Time
Rinsate Blank: YES / NO	
ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

*DESIGNATED PUMP W/ CONTROL BOX UNOPERATIONAL
*LOCK REMOVED W/ BOLT CUTTERS

Well Pumped Dry: YES / NO
Previous Volume Purged: 152 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551906

Confidential Client – Cottage Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 16 MAY ~~MARCH~~ 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-08	Weather: Sunny Cloudy Rain Temp: 60's
Sampling Team: TK	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 6 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	173.00	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 65.45	( ) BAILER
C. Column of Standing Water (C=A-B):	107.55	(✓) 2-Inch Grundfos ( ) 4-Inch Grundfos
D. Purge Factor	x 1.47	( ) Other (Specify)
E. One Well Volume:	158	
F. Three Well Volumes (gallons):	474	**TOTAL VOLUME PURGED:** 490

INDICATOR PARAMETERS

Time	1355	1405	1418	1500	1510	1520	1530	1540	
Gallons Purged	0	55	160	160	240	320	420	490	
Temperature (°C):	10.25	10.24	10.26		10.24	10.26	10.26	10.26	
Specific Conductivity (s):	611	605	599		606	599	599	598	
Dissolved Oxygen (mg/L):	9.89	7.28	6.44		6.38	6.37	6.34	6.35	
pH:	7.05	6.60	6.51		6.48	6.50	6.48	6.50	
Visual Turbidity (L, M, H):									

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 16 May 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMN GW MW8-0 050516	1545	ID NO.:	

Parameters:
( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

NEED LOCK.

Well Pumped Dry: YES / NO
Previous Volume Purged: 152 gallons 490
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551907

Confidential Client – Cot · Grove, Minnesota
WESTON W.O.: 02181-0..-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-09	Weather: Sunny / Cloudy / Rain Temp: 10°F
Sampling Team: KJ / WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: ~~2 inch.~~ 4" (WW)

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	107.95 (WW) ~~104.00~~	Well Evacuation Method ( ) BAILER (✓) 2-Inch Grundfos DEDICATED ( ) 4-Inch Grundfos ( ) Other (Specify)
B. Depth to Water (DTW) (TOC):	- 47.17	
C. Column of Standing Water (C=A-B):	60.78	
D. Purge Factor	0.65 x ~~1.47~~ (WW)	
E. One Well Volume:	39.50	
F. Three Well Volumes (gallons):	118.52	TOTAL VOLUME PURGED: 120

INDICATOR PARAMETERS

Time	1448	1455	1505	1512	1517				
Gallons Purged	5	30	70	100	120				
Temperature (°C):	8.85	10.45	10.51	10.43	10.49				
Specific Conductivity (s):	632	646	668	676	677				
Dissolved Oxygen (mg/L):	1.33	0.16	0.88	1.17	3.25				
pH:	7.62	7.08	7.31	7.41	7.42				
Visual Turbidity (L, M, H):	L	L	L	L	L				

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: __________

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals (X) pH (X) Specific Conductance (X) Temperature ( ) ( ) ( )	Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032

COMMENTS

	Well Pumped Dry: YES / NO Previous Volume Purged: 61 gallons Well Requires Maintenance? YES / NO Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551908

Confidential Client – Cottage Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 15 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-10	Weather: Sunny Cloudy Rain Temp: 34°
Sampling Team: TF / AM	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 8 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~237.00~~ 241.50	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 93.73	( ) BAILER ( ) 2-Inch Grundfos
C. Column of Standing Water (C=A-B):	147.77	(X) 4-Inch Grundfos AM
D. Purge Factor	x 2.61	( ) Other (Specify)
E. One Well Volume:	385.67	(X) DEDICATED PUMP
F. Three Well Volumes (gallons):	1157.03	TOTAL VOLUME PURGED:

INDICATOR PARAMETERS

Time	1335	1400	1430	1500	1530	1630	1700	1710	
Gallons Purged	0	137	302	467	632	~~797~~ 962	1127	1182	
Temperature (°C):	10.37	9.89	9.89	9.86	9.87	9.84	9.83	9.83	
Specific Conductivity (s):	270	365	597	600	599	601	601	601	
Dissolved Oxygen (mg/L):									
pH:	7.57	8.21	7.46	7.44	7.44	7.42	7.41	7.40	
Visual Turbidity (L, M, H):									
GPM	5.45	5.50	5.5	5.5	5.5	5.5			

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Well Pumped Dry: YES / NO
Previous Volume Purged: 360 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551909

Confidential Client – Cot. ge Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 12 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-11	Weather: Sunny Cloudy Rain Temp: 12°
Sampling Team: AM / TF	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 4 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~200.00~~ 186.60	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 102.90	( ) BAILER
C. Column of Standing Water (C=A-B):	83.7	(✗) 2-Inch Grundfos
D. Purge Factor	x 0.65	( ) 4-Inch Grundfos
E. One Well Volume:	54.40	( ) Other (Specify)
F. Three Well Volumes (gallons):	163.21	TOTAL VOLUME PURGED:

INDICATOR PARAMETERS

Time	9:58	10:11	10:27	10:38	10:39	10:40	10:42	10:44	
Gallons Purged	10	50	100	150	153	156	159	165	
Temperature (°C):	10.26	10.85	10.87	10.95	10.97	10.94	10.94	10.94	
Specific Conductivity (s):	9.76	645	6.55	656	657	656	634	657	
Dissolved Oxygen (mg/L):	8.70	7.41	7.27	7.01	7.01	7.00	7.11	7.18	
pH:	9.99	9.35	9.54	9.61	9.60	9.63	9.64	9.65	
Visual Turbidity (L, M, H):	L	L	L	L	L	L	L	L	

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 3/12/05

Sample No.	Time	Sample No.	Time
Media Sample ID:	1540	Rinsate Blank: YES / NO	
CGMNGWMW1100050312		ID NO.:	

Parameters:
( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH 9.65
(X) Specific Conductance 657
(X) Temperature 10.94
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Well Pumped Dry: YES / NO
Previous Volume Purged: 40 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551910

Confidential Client – Cc e Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-12	Weather: Sunny Cloudy Rain Temp: 22° F
Sampling Team: KJ/WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 4 inch.

WELL EVACUATION INFORMATION

141.03

A. Total Depth (Top of Casing = TOC):	141.00	Well Evacuation Method ( ) BAILER (X) 2-Inch Grundfos ( ) 4-Inch Grundfos ( ) Other (Specify)
B. Depth to Water (DTW) (TOC):	- 93.63	
C. Column of Standing Water (C=A-B):	47.4	
D. Purge Factor	x 0.65	
E. One Well Volume:	30.81	
F. Three Well Volumes (gallons):	92.43	TOTAL VOLUME PURGED: 35

INDICATOR PARAMETERS

Time	08.30	0835	0340						
Gallons Purged	0	17.5	35						
Temperature (°C):	10.42	11.17	3.54						
Specific Conductivity (s):	368	247	273						
Dissolved Oxygen (mg/L):	0.81	0.09	0.31						
pH:	8.96	9.76	9.40						
Visual Turbidity (L, M, H):	L	L	M						

NAPL Observed: YES / NO — Well Pumped Dry: YES / NO

ODOR: YES / NO — Other:

Odor Type: ( ) Solvent ( ) Septic ( ) Other

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & isopropyl Ether
(X) Fluorochemicals
(X) pH 9.40
(X) Specific Conductance 278
(X) Temperature 3.54
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Removed Lock with Bolt Cutters

Well Pumped Dry: YES / NO
Previous Volume Purged: 90 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551911

Confidential Client – Cott..ge Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 12 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-13	Weather: Sunny Cloudy Rain Temp: 15°F
Sampling Team: KS / WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 4 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	134.00	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 92.03	( ) BAILER
C. Column of Standing Water (C=A-B):	41.97	(✓) 2-inch Grundfos
D. Purge Factor	x 0.65	( ) 4-inch Grundfos
E. One Well Volume:	27.28	( ) Other (Specify)
F. Three Well Volumes (gallons):	81.84	TOTAL VOLUME PURGED: 97.5

INDICATOR PARAMETERS

Time	1430	1435	1440	1445	1450	1455			
Gallons Purged	10	27.5	45	62.5	80	97.5			
Temperature (°C):	10.85	11.44	11.53	11.61	11.35	11.40			
Specific Conductivity (s):	174	456	474	524	534	532			
Dissolved Oxygen (mg/L):	1.74	0.80	0.71	0.99	1.22	1.25			
pH:	8.73	7.79	7.69	7.57	7.46	7.45			
Visual Turbidity (L, M, H):	M	H	H	H	M	M			

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 12

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMNGWMW1300503 12	1630	ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH 7.45
(X) Specific Conductance 532
(X) Temperature 11.40
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

LOCK WAS CUT TO GAIN ACCESS

Well Pumped Dry: YES / NO
Previous Volume Purged: 16 gallon
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551912

Confidential Client – Cottage Grove, Minnesota
WESTON W.O.: 02181-C 010-0001

DATE: 15 MARCH 2005

WELL EVACUATION/SAMPLING FORM

GENERAL INFORMATION

Well No.: MW-14	Weather: Sunny Cloudy Rain Temp: 24
Sampling Team: KS / WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact Damaged NA
Locked: YES / NO Cut lock off	Well Diameter: 4 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~64.00~~ 59.00 KS	Well Evacuation Method ( ) BAILER (✓) 2-inch Grundfos ( ) 4-inch Grundfos ( ) Other (Specify)
B. Depth to Water (DTW) (TOC):	- 26.85	
C. Column of Standing Water (C=A-B):	32.15	
D. Purge Factor	x 0.65	
E. One Well Volume:	20.9	
F. Three Well Volumes (gallons):	62.7	TOTAL VOLUME PURGED: 24

INDICATOR PARAMETERS

Time	0802	0805	0808					
Gallons Purged	1	12	24					
Temperature (°C):	10.52	10.28	10.03					
Specific Conductivity (s):	528	525	531					
Dissolved Oxygen (mg/L):	10.39	3.49	3.58					
pH:	7.38	7.08	7.02					
Visual Turbidity (L, M, H):	H	M	M					

NAPL Observed: YES / NO	Well Pumped Dry: YES NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3058 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Needs new lock

Well Pumped Dry: YES / NO
Previous Volume Purged: 15 gallons
Well Requires Maintenance? YES NO
Access Requires Maintenance? YES NO

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551913

Confidential Client – Cott Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 12 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: MW-15 | Weather: Sunny Cloudy Rain | Temp: 15°F

Sampling Team: KS/WW | Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged | Concrete Base: Intact Damaged

Locked: YES / NO | Well Diameter: 4 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~186.00~~ 186.54	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 96.08	( ) BAILER
C. Column of Standing Water (C=A-B):	90.46	(✓) 2-inch Grundfos
D. Purge Factor	X 0.65	( ) 4-inch Grundfos
E. One Well Volume:	58.80	( ) Other (Specify)
F. Three Well Volumes (gallons):	176.40	TOTAL VOLUME PURGED: 192.5

INDICATOR PARAMETERS

Time	1545	1550	~~1580~~ 1600	1610	1620	1630	1635	
Gallons Purged	17.5	35	70	105	140	175	192.5	
Temperature (°C):	9.64	9.92	10.04	9.98	9.81	9.72	9.89	
Specific Conductivity (s):	236	294	523	546	549	550	550	
Dissolved Oxygen (mg/L):	0.29	0.14	0.04	0.28	0.33	0.34	0.35	
pH:	8.64	8.54	7.71	7.54	7.50	7.50	7.48	
Visual Turbidity (L, M, H):	M	H	H	L	L	L	L	

NAPL Observed: YES / NO | Well Pumped Dry: YES / NO

ODOR: YES / NO | Other:

Odor Type: ( ) Solvent ( ) Septic ( ) Other

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 12

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMNGWMW150050312	1645	ID NO.:	

Parameters:
( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH 7.48
(X) Specific Conductance 550
(X) Temperature 9.89
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

LOCK WAS CUT TO GAIN ACCESS

Well Pumped Dry: YES / NO
Previous Volume Purged: 60 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551914

Confidential Client – Cottage Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 12 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: MW-16	Weather: Sunny Cloudy Rain Temp: 23°
Sampling Team: AM / TF	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 4 inch.

WELL EVACUATION INFORMATION 141.10

A. Total Depth (Top of Casing = TOC):	140.00	Well Evacuation Method ( ) BAILER (X) 2-Inch Grundfos ( ) 4-Inch Grundfos ( ) Other (Specify)
B. Depth to Water (DTW) (TOC):	- 93.78	
C. Column of Standing Water (C=A-B):	47.32	
D. Purge Factor	x ~~0.47~~ .65	
E. One Well Volume:	30.75	
F. Three Well Volumes (gallons):	92.27	TOTAL VOLUME PURGED:

INDICATOR PARAMETERS

Time	11:59	12:22	12:47	12:47					
Gallons Purged	0	55	980	103					
Temperature (°C):	11.57	10.79	10.85	10.85					
Specific Conductivity (s):	851	848	816	814					
Dissolved Oxygen (mg/L):	7.36	4.44	0.39	0.38					
pH:	9.78	7.98	7.72	7.59					
Visual Turbidity (L, M, H):	L	L	L	L					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 12

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMNGW MW16 0050312	1636	ID NO.:	

Parameters:
( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH 7.59
(X) Specific Conductance 814
(X) Temperature 10.85
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Well Lock were removed unlocked

Well Pumped Dry: YES / NO
Previous Volume Purged: 30 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551915

Confidential Client – Cott Grove, Minnesota
WESTON W.O.: 02181-062-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: MW-17
Sampling Team: KS/WW/AM
Weather: Sunny Cloudy Rain   Temp: 27
Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged
Locked: YES / NO
Concrete Base: Intact / Damaged
Well Diameter: 4inch

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~112.00~~ 114.36
B. Depth to Water (DTW) (TOC):	- 75.28
C. Column of Standing Water (C=A-B):	39.08
D. Purge Factor 0.65	x ~~0.47~~
E. One Well Volume:	25.4
F. Three Well Volumes (gallons):	76.2

Well Evacuation Method
( ) BAILER
(✓) 2-inch Grundfos
( ) 4-inch Grundfos
( ) Other (Specify)   Dedicated Pump

TOTAL VOLUME PURGED: 78

INDICATOR PARAMETERS

Time	1338	1340	1342	1344	1348	1352	1357
Gallons Purged	2	8	16	24	40	56	76
Temperature (°C):	10.55	10.95	11.06	11.05	11.04	11.06	11.04
Specific Conductivity (s):	732	758	762	762	761	760	759
Dissolved Oxygen (mg/L):	1.83	1.63	1.63	1.64	1.67	1.68	1.70
pH:	8.16	7.55	7.50	7.46	7.46	7.40	7.41
Visual Turbidity (L, M, H):	L	L	L	L	L	L	L

NAPL Observed: YES / NO
ODOR: YES / NO
Odor Type: ( ) Solvent ( ) Septic ( ) Other
Well Pumped Dry: YES / NO
Other:

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M)   John Flaherty
Phone: 651-778-5352   814-231-8032

COMMENTS

Cut Lock off for Purge

Well Pumped Dry: YES / NO
Previous Volume Purged: 23 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551916

Confidential Client – Cot Grove, Minnesota
WESTON W.O.: 02181-0__-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: MW-18	Weather: Sunny Cloudy Rain Temp: 28
Sampling Team: KS/WW/JM	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 4 inch

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~92.00~~ 93.20 KS	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 69.07	( ) BAILER
C. Column of Standing Water (C=A-B):	24.13	(✓) 2-Inch Grundfos Dedicated Pump
D. Purge Factor	KS 0.65 x ~~0.47~~	( ) 4-Inch Grundfos
E. One Well Volume:	15.68 ~~11.34~~ KS	( ) Other (Specify)
F. Three Well Volumes (gallons):	~~34.0~~ 47.1 KS	TOTAL VOLUME PURGED: 50

INDICATOR PARAMETERS

Time	1158	1200	1202	1204	1206	1208			
Gallons Purged	2	10	20	30	40	50			
Temperature (°C):	10.96	11.62	11.63	11.48	11.47	11.44			
Specific Conductivity (s):	730	763	764	772	773	774			
Dissolved Oxygen (mg/L):	1.21	1.26	1.28	1.39	1.43	1.47			
pH:	7.54	7.48	7.47	7.45	7.44	7.43			
Visual Turbidity (L, M, H):	M	M	M	M	M	M			

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters:
( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 314-231-8032

COMMENTS

No lock on well; Dedicated Pump

Well Pumped Dry: YES / NO
Previous Volume Purged: 15 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551917

Confidential Client – Co[illegible]e Grove, Minnesota
WESTON W.O.: 02181- _-010-0001

DATE: 15 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: MW-19	Weather: Sunny Cloudy Rain Temp: 15°F
Sampling Team: KS / WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 4 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	120.00	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	-52.93	( ) BAILER
C. Column of Standing Water (C=A-B):	67.07	( ) 2-Inch Grundfos Dedicated
D. Purge Factor 0.65	x ~~0.47~~	( ) 4-Inch Grundfos
E. One Well Volume:	43.59	( ) Other (Specify)
F. Three Well Volumes (gallons):	130.77	TOTAL VOLUME PURGED:

INDICATOR PARAMETERS

Time									
Gallons Purged									
Temperature (°C):									
Specific Conductivity (s):									
Dissolved Oxygen (mg/L):									
pH:									
Visual Turbidity (L, M, H):									

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters:
( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Confirm Total Depth of Well
CASING TOP BROKEN, NO LOCK ON WELL
DESIGNATED PUMP NON-OPERATIONAL,
UNABLE TO PURGE + SAMPLE

Well Pumped Dry: YES / NO
Previous Volume Purged: 35 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"-0.16; 4"-0.65; 6"-1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client – Co...ge Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 16 May ~~MARCH~~ 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: MW-19	Weather: Sunny Cloudy Rain Temp: 60s
Sampling Team: JT	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 4 inch

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	120.00	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 53.3	( ) BAILER
C. Column of Standing Water (C=A-B):	67.0	(X) 2-Inch Grundfos
D. Purge Factor	x 0.47	( ) 4-Inch Grundfos
E. One Well Volume:	32	( ) Other (Specify)
F. Three Well Volumes (gallons):	100	TOTAL VOLUME PURGED: 10

INDICATOR PARAMETERS

Time	16:00	16:05							
Gallons Purged	0	10							
Temperature (°C):									
Specific Conductivity (s):									
Dissolved Oxygen (mg/L):		DRY							
pH:									
Visual Turbidity (L, M, H):									

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 17 MAY 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMN GW MW19 0050517	0810	ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Confirm Total Depth of Well	Well Pumped Dry: YES / NO
MEASURED TD AT 64.35 TOC PROBABLY DUE TO BOREHOLE COLLAPSE. - PULLED PUMP	Previous Volume Purged: ~~35 gallons~~ 10 GAL
	Well Requires Maintenance? YES / NO
	Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551919

Confidential Client – Cc e Grove, Minnesota
WESTON W.O.: 02181-..2-010-0001

DATE: 12 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: MW-101	Weather: Sunny Cloudy Rain Temp: 15 F
Sampling Team: KJ / WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 2 inch.

WELL EVACUATION INFORMATION

		Well Evacuation Method
A. Total Depth (Top of Casing = TOC):	~~100.00~~ 101.90	(✓) BAILER
B. Depth to Water (DTW) (TOC):	- 94.87	( ) 2-Inch Grundfos
C. Column of Standing Water (C=A-B):	7.03	( ) 4-Inch Grundfos
D. Purge Factor	x 0.16	( ) Other (Specify)
E. One Well Volume:	1.12	
F. Three Well Volumes (gallons):	3.37	TOTAL VOLUME PURGED: 3.5

INDICATOR PARAMETERS 0930 C

Time	~~0900~~	0935	0939	0945					
Gallons Purged	0.7	1.3	2.0	3.0					
Temperature (°C):	8.21	9.42	9.61	9.40					
Specific Conductivity (s):	2161	2190	2217	2211					
Dissolved Oxygen (mg/L):	6.08	0.04	0.37	1.17					
pH:	7.03	7.13	7.28	7.32					
Visual Turbidity (L, M, H):	m	m	m	m					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 12

~~CG-MNG~~ Sample No.	Time	Sample No.	Time
Media Sample ID:	/	Rinsate Blank: YES / NO	
CGMNGWMW101005031 2	1605	ID NO.:	

Parameters:
( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH 7.32
(X) Specific Conductance 2211
(X) Temperature 9.40
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Well Pumped Dry: YES / NO
Previous Volume Purged: 2 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factor: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551920

2095.0143

Confidential Client – Cot' Grove, Minnesota
WESTON W.O.: 02181-0..-010-0001

DATE: 12 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: MW-102	Weather: Sunny Cloudy Rain Temp: 15°F
Sampling Team: KS/WW	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 2 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~96.00~~ 94.67	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	-91.97	(✓) BAILER
C. Column of Standing Water (C=A-B):	2.7	( ) 2-Inch Grundfos
D. Purge Factor	x 0.16	( ) 4-Inch Grundfos
E. One Well Volume:	0.43	( ) Other (Specify)
F. Three Well Volumes (gallons):	1.3	TOTAL VOLUME PURGED: 1.5

INDICATOR PARAMETERS

Time	1025	1030	1035	1040						
Gallons Purged	0.25	0.50	1.0	1.5						
Temperature (°C):	9.40	8.83	9.18	9.02						
Specific Conductivity (s):	752	765	767	770						
Dissolved Oxygen (mg/L):	0.72	0.69	1.17	1.19						
pH:	7.49	7.60	7.61	7.60						
Visual Turbidity (L, M, H):	M	M	H	H						

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 12

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMNGWMW10200503 12	1615	ID NO.:	

Parameters:
( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH 7.60
(X) Specific Conductance 770
(X) Temperature 9.02
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

CASING TOP BROKEN. UNABLE TO LOCK

Well Pumped Dry: YES / NO
Previous Volume Purged: 2 gallons
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551921

Confidential Client – Cot · Grove, Minnesota
WESTON W.O.: 02181-0..-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PZ-14	Weather: Sunny Cloudy Rain Temp: 70°F
Sampling Team: KJ / WW / AM	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact Damaged
Locked: YES / NO	Well Diameter: 2 inch.

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	~~100.00~~ 187.71	Well Evacuation Method ( ) BAILER (✓) 2-inch Grundfos ( ) 4-inch Grundfos ( ) Other (Specify)
B. Depth to Water (DTW) (TOC):	- 64.26	
C. Column of Standing Water (C=A-B):	123.45	
D. Purge Factor	x 0.16	
E. One Well Volume:	19.75	
F. Three Well Volumes (gallons):	59.25	TOTAL VOLUME PURGED: 72.5

INDICATOR PARAMETERS

Time	1620	1625	1630	1635					
Gallons Purged	5	27.5	50	72.5					
Temperature (°C):	7.25	10.37	10.41	10.60					
Specific Conductivity (s):	149	189	212	276					
Dissolved Oxygen (mg/L):	2.76	0.26	0.06	0.04					
pH:	9.41	9.61	9.21	8.89					
Visual Turbidity (L, M, H):	M	H	H	H					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals (X) pH (X) Specific Conductance (X) Temperature ( ) ( ) ( )	Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032

COMMENTS

BOLT CUTTERS USED TO REMOVE LOCK PZ-14 WELL IS SMALLER OF 2 WELLS	Well Pumped Dry: YES / NO Previous Volume Purged: 5 gallons Well Requires Maintenance? YES NO Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"-0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551922

Confidential Client – Cottage Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PW-01	Weather: Sunny Cloudy Rain Temp: 20°F
Sampling Team: TF	Sampler's Signature:

WELL INFORMATION

Well Function: Fire Protection Supply	Well in operation at time of sampling? Yes No
Pump Constructed with a flow meter? Yes No	Calculated Flow Rate: 729 gallons (Average for 2004)

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	205.00	Well Evacuation Method IF WELL IS ACTIVE, PURGE ONE WELL VOLUME TO CLEAR SAMPLE LINE FROM WELL HEAD. IF INACTIVE PURGE THREE VOLUMES TO CLEAR LINES AND WELL. If no flow meter, calculate purge volume based on established flow rate
B. Well Diameter: 20 inch and 14 inch (inches)	20	
C. Average Annual Pumping Rate (2004) (gpm)	729	
D. Calculated Purge Volume (gallons)	2105	
F. Three Well Volumes (gallons):	6316	**TOTAL VOLUME PURGED:** 8100

INDICATOR PARAMETERS

Time	07:42	07:52			
Gallons Purged	0	8100			
Flow Meter Reading	567724800	567732900			
Temperature (°C):					
Specific Conductivity (s):					
pH:					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 14 MAR 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMN GW PW1 0050314	0752	ID NO.:	
Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals		Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032	

COMMENTS

SAMPLE PORT WITH PLASTIC TIP.	Well Pumped Dry: YES / NO Volume Purged: Well Requires Maintenance? YES / NO Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client – Cot. _e Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PW-02	Weather: Sunny Cloudy Rain Temp: 20
Sampling Team: TF	Sampler's Signature:

WELL INFORMATION

Well Function: Process Water Loop	Well in operation at time of sampling? Yes No
Pump Constructed with a flow meter? Yes No	Calculated Flow Rate: 749 gallons (Average for 2004)

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	205.00	Well Evacuation Method IF WELL IS ACTIVE, PURGE ONE WELL VOLUME TO CLEAR SAMPLE LINE FROM WELL HEAD. IF INACTIVE PURGE THREE VOLUMES TO CLEAR LINES AND WELL. If no flow meter, calculate purge volume based on established flow rate
B. Well Diameter: 20 inch (inches)	20	
C. Average Annual Pumping Rate (2004) (gpm)	749	
D. Calculated Purge Volume (gallons)	1974	
F. Three Well Volumes (gallons):	5924	TOTAL VOLUME PURGED: 6000

INDICATOR PARAMETERS

Time	07 59	08:07			
Gallons Purged	0	6000			
Flow Meter Reading	223634800	223640800			
Temperature (°C):					
Specific Conductivity (s):					
pH:					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 14 MAR 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMN GW PW2 0 050314	0807	ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals	Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032

COMMENTS

SAMPLE PORT ALL METAL.	Well Pumped Dry: YES / NO Volume Purged: Well Requires Maintenance? YES / NO Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551924

Confidential Client – Cot ge Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PW-03	Weather: Sunny Cloudy Rain Temp: 20
Sampling Team: TF	Sampler's Signature:

WELL INFORMATION

Well Function: Process Water Loop	Well in operation at time of sampling? Yes No
Pump Constructed with a flow meter? Yes No	Calculated Flow Rate: 924 gallons (Average for 2004)

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	205.00	Well Evacuation Method
B. Well Diameter: 24 inch and 16 inch (inches)	24	IF WELL IS ACTIVE, PURGE ONE WELL VOLUME TO CLEAR SAMPLE LINE FROM WELL HEAD. IF INACTIVE PURGE THREE VOLUMES TO CLEAR LINES AND WELL.
C. Average Annual Pumping Rate (2004) (gpm)	924	
D. Calculated Purge Volume (gallons)	3006	If no flow meter, calculate purge volume based on established flow rate
F. Three Well Volumes (gallons):	9020	TOTAL VOLUME PURGED: 11,320

INDICATOR PARAMETERS

Time	08 14		08:24						
Gallons Purged	0		11,320						
Flow Meter Reading									
Temperature (°C):									
Specific Conductivity (s):									
pH:									

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 14 MAR 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMN GW PW3 0 050314	0824	ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Well Pumped Dry: YES / NO
Volume Purged:
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551925

Confidential Client – Co… …e Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PW-04	Weather: Sunny Cloudy Rain Temp: 20°
Sampling Team: TT	Sampler's Signature:

WELL INFORMATION

Well Function: Process Water Loop	Well in operation at time of sampling? Yes No
Pump Constructed with a flow meter? Yes No	Calculated Flow Rate: 817 gallons (Average for 2004)

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	205.00	Well Evacuation Method IF WELL IS ACTIVE, PURGE ONE WELL VOLUME TO CLEAR SAMPLE LINE FROM WELL HEAD. IF INACTIVE PURGE THREE VOLUMES TO CLEAR LINES AND WELL. If no flow meter, calculate purge volume based on established flow rate
B. Well Diameter: 24 inch and 16 inch (inches)	24	
C. Average Annual Pumping Rate (2004) (gpm)	817	
D. Calculated Purge Volume (gallons)	3828	
F. Three Well Volumes (gallons):	11,487	TOTAL VOLUME PURGED: 12255

INDICATOR PARAMETERS

Time	08:31	08:46			
Gallons Purged	0	12,255			
Flow Meter Reading					
Temperature (°C):					
Specific Conductivity (s):					
pH:					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 14 MAR 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMNGW PW40050314	0846	ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

SAMPLING PORT ALL METAL PURGE BASED ON RECORDED FLOW RATE FOR 2004	Well Pumped Dry: YES / NO Volume Purged: Well Requires Maintenance? YES / NO Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551926

Confidential Client – Cot. Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PW-05	Weather: Sunny Cloudy Rain Temp: 20s
Sampling Team: TF	Sampler's Signature:

WELL INFORMATION

Well Function: Process Water Loop	Well in operation at time of sampling? Yes No
Pump Constructed with a flow meter? Yes No	Calculated Flow Rate: 1,481 gallons (Average for 2004)

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	205.00	Well Evacuation Method
B. Well Diameter: 36 inch and 24 inch (inches)	36	IF WELL IS ACTIVE, PURGE ONE WELL VOLUME TO CLEAR SAMPLE LINE FROM WELL HEAD. IF INACTIVE PURGE THREE VOLUMES TO CLEAR LINES AND WELL.
C. Average Annual Pumping Rate (2004) (gpm)	1481	
D. Calculated Purge Volume (gallons)	6343	If no flow meter, calculate purge volume based on established flow rate
F. Three Well Volumes (gallons):	19,030	TOTAL VOLUME PURGED: 21,000

INDICATOR PARAMETERS

Time	08:53	09:08			
Gallons Purged	0	21,000			
Flow Meter Reading					
Temperature (°C):					
Specific Conductivity (s):					
pH:					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 14 MAR 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMN GW PW5 @ 050314	09:08	ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

Well Pumped Dry: YES / NO
Volume Purged:
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551927

Confidential Client – Co[illegible] Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PW-06	Weather: Sunny Cloudy Rain Temp: 20 F
Sampling Team: TT	Sampler's Signature: T-[illegible]

WELL INFORMATION

Well Function: Incinerator Supply	Well in operation at time of sampling? Yes No
Pump Constructed with a flow meter? Yes No	Calculated Flow Rate: 576 gallons (Average for 2004)

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	205.00	Well Evacuation Method IF WELL IS ACTIVE, PURGE ONE WELL VOLUME TO CLEAR SAMPLE LINE FROM WELL HEAD. IF INACTIVE PURGE THREE VOLUMES TO CLEAR LINES AND WELL. If no flow meter, calculate purge volume based on established flow rate
B. Well Diameter: 24 inch (inches)	20	
C. Average Annual Pumping Rate (2004) (gpm)	576	
D. Calculated Purge Volume (gallons)	2631	
F. Three Well Volumes (gallons):	7893	TOTAL VOLUME PURGED: 57 SEE NOTE.

INDICATOR PARAMETERS

Time	0913	0914			
Gallons Purged	0	57			
Flow Meter Reading					
Temperature (°C):					
Specific Conductivity (s):					
pH:					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 14 MAR 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMN GW PW6 00050314	0914	ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals	Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032

COMMENTS

ACCORDING TO PLANT PERSONNEL WELL RUNS CONTINUOUSLY SO PURGED SAMPLING PORT 1 MINUTE BEFOR SAMPLING.

Well Pumped Dry:	YES / NO
Volume Purged:	
Well Requires Maintenance?	YES / NO
Access Requires Maintenance?	YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551928

Confidential Client – Cc ,e Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 15 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PW-07	Weather: Sunny Cloudy/Rain Temp: 30 F
Sampling Team:	Sampler's Signature:

WELL INFORMATION

Well Function: Trap Field Water Supply	Well in operation at time of sampling? Yes No
Pump Constructed with a flow meter? Yes No	Well Diameter: 4 inches

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	200.00	Well Evacuation Method Depth to water based on previously recorded measurement (2004)
B. Depth to Water (DTW) (TOC):	-75.00	
C. Column of Standing Water (C=A-B):	125.00	
D. Purge Factor	x 0.65	
E. One Well Volume:	81.00	
F. Three Well Volumes (gallons):	244.00	TOTAL VOLUME PURGED:

INDICATOR PARAMETERS

Time					
Gallons Purged					
Flow Meter Reading					
Temperature (°C):					
Specific Conductivity (s):					
pH:					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION SAMPLE DATE:

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
		ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals	Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032

COMMENTS

WELL LINES FROZEN NO SAMPLE COLLECTED.	Well Pumped Dry: YES / NO Volume Purged: Well Requires Maintenance? YES / NO Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551929

Confidential Client – Co. ,e Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 16 ~~MARCH~~ MAY 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PW-07	Weather: Sunny Cloudy Rain Temp: 60s
Sampling Team: TF	Sampler's Signature:

WELL INFORMATION

Well Function: Trap Field Water Supply	Well in operation at time of sampling? Yes No
Pump Constructed with a flow meter? Yes No	Well Diameter: 4 inches

WELL EVACUATION INFORMATION

			Well Evacuation Method
A.	Total Depth (Top of Casing = TOC):	200.00	Depth to water based on previously recorded measurement (2004)
B.	Depth to Water (DTW) (TOC):	-75.00	
C.	Column of Standing Water (C=A-B):	125.00	
D.	Purge Factor	x 0.65	
E.	One Well Volume:	81.00	
F.	**Three Well Volumes (gallons):**	**244.00**	**TOTAL VOLUME PURGED:**

INDICATOR PARAMETERS

Time	1:56			11:21				
Gallons Purged	0			250				
Flow Meter Reading	10 gpm			10 gpm				
		75 gal	110 gal	150	200	250		
Temperature (°C):	9.43c	9.16	9.4	9.34	9.38	9.40		
Specific Conductivity (s):	570	563	562	562	565	562		
pH:	7.08	6.74	6.75	6.84	6.89	6.86		

NAPL Observed: YES / NO	**Well Pumped Dry:** YES / NO
ODOR: YES / NO	**Other:**
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 16 May 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMN GW PW7 0 050516	11:25	ID NO.:	
Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals		Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032	

COMMENTS

	Well Pumped Dry: YES / NO
	Volume Purged:
	Well Requires Maintenance? YES / NO
	Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

Confidential Client – Cc · e Grove, Minnesota
WESTON W.O.: 02181-ᴗ2-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: PW-08	Weather: Sunny Cloudy Rain Temp: 20 s
Sampling Team: TF	Sampler's Signature:

WELL INFORMATION

Protective Casing: Intact / Damaged	Concrete Base: Intact / Damaged
Locked: YES / NO	Well Diameter: 4

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):	208	Well Evacuation Method
B. Depth to Water (DTW) (TOC):	- 108	IF WELL IS ACTIVE, PURGE SUFFICIENT VOLUME TO CLEAR SAMPLE LINE FROM WELL HEAD.
C. Column of Standing Water (C=A-B):	100	SAMPLED FROM BASEMENT SINK. WELL COULD NOT BE ACCESSED.
D. Purge Factor	.65	
E. One Well Volume:	65	
F. Three Well Volumes (gallons):	195	**TOTAL VOLUME PURGED:** 219

INDICATOR PARAMETERS

Time	10 20	10 21	10 40	10 52	11:05	11:20	11:30	11:35	
Gallons Purged	0	3.53		97.4	135	177	205	219	
Temperature (°C):			14.05	13.18	13.21	13.26	13.25		
Specific Conductivity (s):			665	670	670	670	670		
Dissolved Oxygen (mg/L):									
pH:			9.09	9.87	9.96	10.03	9.98		
Visual Turbidity (L, M, H):									
GPM	3.53	3.53	3.0	2.85	2.85	2.85	2.85		

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION SAMPLE DATE: 14 MAR 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMN GW PW8 0 050314	11:35	ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether
(X) Fluorochemicals
(X) pH
(X) Specific Conductance
(X) Temperature
( )
( )
( )

Laboratory: Exygen Research
3048 Research Drive
State College, PA 16801
Contacts: Kent Lindstrom (3M) John Flaherty
Phone: 651-778-5352 814-231-8032

COMMENTS

WELL DEPTH AND WATER DEPTH FROM PREVIOUS RECORDED DATA.

Well Pumped Dry: YES / NO
Previous Volume Purged:
Well Requires Maintenance? YES / NO
Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551931

Confidential Client – Cot[illegible] Grove, Minnesota
WESTON W.O.: 02181-002-010-0001

DATE: 14 MARCH 2005

WELL EVACUATION/SAMPLING FORM

SITE INFORMATION

Well No.: B116	Weather: Sunny Cloudy Rain Temp: 20°F
Sampling Team: TF	Sampler's Signature: T-F

GENERAL INFORMATION

Location: Kitchen Sink (after carbon)	System in operation at time of sampling? Yes No
System Constructed with a flow meter? Yes No	

WELL EVACUATION INFORMATION

A. Total Depth (Top of Casing = TOC):		Well Evacuation Method: RAN TAP AT APPROXIMATELY 2 gpm FOR 15 MINUTES.
B. Well Diameter: 20 inch and 14 inch (inches)		
C. Calculated Purge Volume (gallons)		
D. Calculated Purge Volume (gallons)		
F. Three Well Volumes (gallons):		TOTAL VOLUME PURGED:

INDICATOR PARAMETERS

Time	0936	0951			
Gallons Purged	0	30			
Flow Meter Reading					
Temperature (°C):					
Specific Conductivity (s):					
pH:					

NAPL Observed: YES / NO	Well Pumped Dry: YES / NO
ODOR: YES / NO	Other:
Odor Type: ( ) Solvent ( ) Septic ( ) Other	

SAMPLE COLLECTION INFORMATION

SAMPLE DATE: 14 MAR 05

Sample No.	Time	Sample No.	Time
Media Sample ID:		Rinsate Blank: YES / NO	
CGMNGW B116 0050314	0951	ID NO.:	

Parameters: ( ) 8260 VOC & Isopropyl Ether (X) Fluorochemicals	Laboratory: Exygen Research 3048 Research Drive State College, PA 16801 Contacts: Kent Lindstrom (3M) John Flaherty Phone: 651-778-5352 814-231-8032

COMMENTS

SAMPLED KITCHEN SINK	Well Pumped Dry: YES / NO Volume Purged: Well Requires Maintenance? YES / NO Access Requires Maintenance? YES / NO

Purge Factors: 2"- 0.16; 4"- 0.65; 6"- 1.47; 8"-2.61; 10"-4.08 (gallons per linear foot of water)

3MA01551932

APPENDIX B
SOIL BORING LOGS

OVERBURDEN BORING LOG

SITE ID:	**D101**
Page 1 of 1	DATE: 24 May 05

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	--
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	D1 Former HF Tar Neutralization Pit	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs)	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	25
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	1	2	2	3	4	5	60	Mst	2.5y 2.5/2					Soft				Black, Topsoil
	1	2			3	4	5	60	Mst	7.5YR 4/4	0	60	30	10	Loose				Brn. Silty SAND, poorly sorted, fine grain
	2	4	3	4	3	4	7	20	Mst	7.5YR 4/4	0	60	30	10	Loose				As Above
	4	6	2	3	5	7	8	50	Mst	10YR 5/6	0	70	20	10	Loose				Ylw. Brn. Silty SAND, poorly sorted, medium grain
	6	8	5	4	5	4	9	50	Mst	10YR 5/6	0	70	20	10	Loose				As Above
	8	10	6	5	10	10	15	60	Mst	10YR 5/6	0	70	20	10	Loose				As Above
	10	12	5	7	9	11	16	70	Mst	2.5Y 4/6	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain
	12	14	8	10	13	10	23	50	Mst	2.5Y 4/6	0	80	20	0	Loose				As Above
	14	16	16	16	22	27	38	40	Mst	2.5Y 4/6	20	60	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain, with dolomite gravel
	16	18	18	18	16	14	34	40	Mst	2.5Y 4/6	20	60	20	0	Loose				As Above
	18	20	6	6	9	9	15	70	Mst	2.5Y 4/6	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, coarse grain
	20	22	9	25	35	34	60	20	Mst	2.5Y 4/6	20	60	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain, with dolomite gravel
	22	24	13	13	9	11	22	50	Mst	2.5Y 4/6	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatley sorted, coarse grain
	24	25	10	11			11	70	Mst	2.5Y 4/6	0	80	20	0	Loose				As Above

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID: D102
Page 1 of 1 | DATE: 24 May 05

CLIENT: Confidential
SITE NAME: Cottage Grove, MN Facility
PROJECT NO.: 02181-002-010-0001
Area Name: DI Former HF Tar Neutralization Pit
Drilling Contractor: American Engineering & Testing
Drilling Equipment: HSA
Logged By: Ethan Caldwell

ELEV (GRND)[a]:
ELEV (TOC)[b]: –
NORTHING:
EASTING:
Depth to Water (ft bgs): NM
Total Boring Depth (ft bgs): 25
Depth to Refusal (ft bgs): NA
Boring Diameter (inches): 6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	2	2	3	3	5	80	Mst	2.5Y 4/4	0	60	30	10	Loose				Brn. Silty SAND, poorly sorted, fine grain
	2	4	1	1	2	3	3	80	Wet	2.5Y 4/4	0	60	30	10	Loose				As Above
	4	6	2	3	3	3	6	50	Mst	2.5Y 4/4	0	60	30	10	Loose				As Above
	6	8	2	3	5	10	8	80	Mst	2.5Y 4/4	0	60	30	10	Loose				As Above
	8	10	8	10	10	10	20	80	Mst	2.5Y 4/6	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, well sorted, fine grain
	10	12	6	10	11	17	21	80	Mst	2.5Y 4/6	0	80	20	0	Loose				As Above
	12	14	21	32	22	21	54	60	Mst	2.5Y 4/6	30	40	30	0	Dense				Lgt. Ylw. Brn. Silty Gravely SAND, very poorly sorted, coarse grain
	14	16	10	11	13	14	24	50	Mst	2.5Y 4/6	30	40	30	0	Loose				As Above
	16	18	12	10	11	9	21	70	Mst	2.5Y 4/6	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, poorly sorted, coarse grain
	18	20	10	6	10	14	16	70	Mst	2.5Y 4/6	0	80	20	0	Loose				As Above
	20	22	16	12	14	12	26	70	Mst	2.5Y 4/6	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, well sorted, fine grain
	22	24	7	8	8	11	16	80	Mst	2.5Y 4/6	0	80	20	0	Loose				As Above
	24	25	24	16			16		Mst	2.5Y 4/6	0	80	20	0	Dense				As Above

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size   bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.
f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)
bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID: D103
Page 1 of 2 | **DATE:** 18 May 05

CLIENT:	Confidential
SITE NAME:	Cottage Grove, MN Facility
PROJECT NO.:	02181-002-010-0001
Area Name:	D1 Former HF Tar Neutralization Pit
Drilling Contractor:	American Engineering & Testing
Drilling Equipment:	HSA
Logged By:	Ethan Caldwell

ELEV (GRND)[a]:	
ELEV (TOC)[b]:	--
NORTHING:	
EASTING:	
Depth to Water (ft bgs):	NM
Total Boring Depth (ft bgs):	70
Depth to Refusal (ft bgs):	NA
Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	3	4	4	4	8	40	Wet	7.5YR 4/4	0	60	30	10	Loose				Brn. Silty SAND, poorly sorted, fine grain
	2	4	2	6	5	5	11	70	Wet	7.5YR 4/4	0	60	30	10	Loose				As Above
	4	6	2	2	3	4	5	70	Wet	7.5YR 4/4	0	60	30	10	Loose	0.0			As Above
	6	8	1	2	4	5	6	70	Wet	7.5YR 4/4	0	60	30	10	Loose				As Above
	8	10						70	Mst	2.5Y 6/4	0	80	20	0	Loose				Lgt. Ywl. Brn Silty SAND, moderatly sorted, fine grain
	10	12	6	6	12	13	18	80	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	12	14	5	6	3	6	9	80	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			Lgt. Ywl. Brn Silty SAND, moderatly sorted, medium grain
	14	16	5	3	4	8	7	80	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	16	18	5	6	4	3	10	90	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	18	20	6	4	5	7	9	100	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			Lgt. Ywl. Brn Silty SAND, moderatly sorted, coarse grain
	20	22	7	8	15	15	23	80	Mst	2.5Y 6/4	0	80	20	0	Loose				Lgt. Ywl. Brn Silty SAND, moderatly sorted, medium grain
	22	24	11	6	7	8	13	80	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			As Above
	24	26	11	12	9	13	21	80	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	26	28	9	8	11	15	19	80	Wet	2.5Y 6/4	0	80	20	0	Loose				As Above
	28	29	9	13			52	80	Wet	2.5Y 6/4	0	80	20	0	Loose				As Above
	29	30			39	33	52		Wet	2.5Y 6/4	10	80	10	0	Dense				As Above
	30	32	22	18	16	12	34	100	Mst	2.5Y 6/4	10	80	10	0	Loose				Lgt. Ywl. Brn Silty SAND, moderatly sorted, coarse grain, with gravel
	32	34	6	9	12	13	21	80	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	34	36	11	12	12	15	24	90	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			Lgt. Ywl. Brn Silty SAND, moderatly sorted, coarse grain
	36	38	8	9	11	13	20	80	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	38	40	11	8	9	7	17	80	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	40	42	5	5	9	11	14	90	Mst	2.5Y 6/4	0	80	20	0	Loose				Lgt. Ywl. Brn Silty SAND, moderatly sorted, medium grain
																			As Above

Continue on Page 2

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size
bgs: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID: **D103**

Page 2 of 2 | DATE: 18 May 05

CLIENT: Confidential
SITE NAME: Cottage Grove, MN Facility
PROJECT NO.: 02181-002-010-0001
Area Name: D1 Former HF Tar Neutralization Pit
Drilling Contractor: American Engineering & Testing
Drilling Equipment: HSA
Logged By: Ethan Caldwell

ELEV (GRND)[a]:
ELEV (TOC)[b]: --
NORTHING:
EASTING:
Depth to Water (ft bgs): NM
Total Boring Depth (ft bgs): 70
Depth to Refusal (ft bgs): NA
Boring Diameter (inches): 6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	42	44	8	10	18	19	28	90	Mst	2.5Y 6/4	0	80	20	0	Loose				Lgt. Ywl. Brn Silty SAND, moderatly sorted, medium grain
	44	46	5	9	13	16	22	80	Mst	2.5Y 6/5	0	80	20	0	Loose	0.0			As Above
	16	48	7	11	14	9	25	80	Mst	2.5Y 6/6	0	80	20	0	Loose				As Above
	48	50	10	14	18	19	32	75	Mst	2.5Y 6/7	0	80	20	0	Loose				As Above
	50	52	10	10	14	16	24	75	Mst	2.5Y 6/8	0	80	20	0	Loose				Lgt. Ywl. Brn Silty SAND, moderatly sorted, coarse grain
	52	54	10	15	18	16	33	75	Mst	2.5Y 6/9	0	80	20	0	Loose	0.0			As Above
	54	56	15	16	18	20	34	80	Mst	2.5Y 6/10	0	80	20	0	Loose				As Above
	56	58	8	13	15	15	28	70	Mst	2.5Y 6/11	0	80	20	0	Loose				As Above
	58	60	12	11	16	16	27	80	Mst	2.5Y 6/12	0	80	20	0	Loose				As Above
	60	62	8	14	19	14	33	80	Mst	2.5Y 6/13	0	80	20	0	Loose	0.0			As Above
	62	64	16	23	30	24	53	60	Mst	2.5Y 6/14	0	80	20	0	Dense				As Above
	64	66	16	19	31	42	50	90	Mst	2.5Y 6/15	0	80	20	0	Dense				As Above
	66	68	27	26	39	45	65	90	Mst	2.5Y 6/16	0	80	20	0	Dense				As Above
	68	70	17	20	19	12	39	90	Mst	2.5Y 6/16	0	80	20	0	Dense				As Above
																			Terminated boring at 70 fbgs.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size   bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.
f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)
bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID: D104
Page 1 of 2 | DATE: 18 May 05

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	–
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	D1 Former HF Tar Neutralization Pit	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs)	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	70
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well
(X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well
(X) Abandoned by Grout
( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	1	3	9	10	12	70	Dry	7.5YR 4/4	0	60	30	10	Loose				Brn. Silty SAND, poorly sorted, fine grain
	2	4	4	3	4	4	7	70	Dry	7.5YR 4/4	0	60	30	10	Loose	0.0			Brn. Silty SAND, poorly sorted, fine grain, with organic matter
	4	6	2	3	3	3	6	70	Wet	7.5YR 4/4	0	60	30	10	Loose				As Above
	6	8	1	3	5	7	8	90	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain
	8	10	3	7	10	12	17	90	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	10	12	7	10	12	17	22	90	Mst	2.5Y 6/4	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, coarse grain
	12	14	4	10	9	8	19	80	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	14	16	5	8	11	11	19	75	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			As Above
	16	18	6	6	6	4	12	90	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	18	20	5	3	7	6	10	90	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	20	22	5	3	7	11	10	90	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			As Above
	22	24	5	9	9	12	18	80	Mst	2.5Y 6/4	0	60	40	0	Loose				Lgt. Ylw. Brn. Silty SAND, well sorted, fine gain
	24	26	6	5	6	6	11	80	Mst	2.5Y 6/4	0	60	40	0	Loose				As Above
	26	28	5	6	9	12	15	80	Wet	2.5Y 6/4	0	60	40	0	Loose				As Above
	28	30	14	15	12	10	27	80	Dry	5Y 6/4	0	80	20	0	Loose				Pale Olive Silty SAND, moderatly sorted, fine grain
	30	32	15	17	21	14	38	80	Dry	5Y 6/4	0	80	20	0	Loose	0.0			Pale Olive Silty SAND, very poorly sorted, coarse grain
	32	34	12	11	10	12	21	80	Dry	5Y 6/4	0	80	20	0	Loose				Pale Olive Silty SAND, moderatly sorted, medium grain
	34	36	5	7	9	12	16	70	Dry	5Y 6/4	0	80	20	0	Loose	0.0			As Above
	36	38	6	7	8	8	15	80	Dry	5Y 6/4	0	80	20	0	Loose				As Above
	38	40	6	7	8	9	15	90	Dry	5Y 6/4	0	80	20	0	Loose				As Above
	40	42	4	7	9	11	16	75	Dry	5Y 6/4	0	80	20	0	Loose	0.0			As Above
	42	44	8	9	12	11	21	80	Dry	5Y 6/4	0	80	20	0	Loose				As Above

Continue on Page 2

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size   bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID:	D201
Page 2 of 2	DATE: 17 May 05

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	-
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	D2 Former Sludge Area	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs)	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	44
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	39	40			11	14	20	80	Mst	5Y 6/3	0	80	20	0	Loose				Pale Olive, Silty SAND, well sorted, fine grain
	40	42	8	8	8	8	16	80	Mst	5Y 6/3	0	80	20	0	Loose				As Above
	42	44	6	5	7	12	12	80	Mst	5Y 6/3	0	80	20	0	Loose				As Above

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.
f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)
f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size
bgs: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	--
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	D2 Former Sludge Disposal Area	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs)	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	25
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

SITE ID: **D202**
Page 1 of 2 | DATE: 16 May 05

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	1	4	6	4	10	20	Mst	5Y 2.5/2	0	30	60	10	Soft				Blk, Sandy SILT, organic
	2	4	2	1	1	1	2	50	Mst	5Y 5/8	0	60	40	0	Loose				Olive, Silty SAND, poorly sorted
	4	6	1	1	0	1	1	0											No Recovery
	6	8	1	1	1	0	2	100	Wet	5Y 4/3	0	60	40	0	Loose				Olive Brn. Silty SAND, poorly sorted, with black staining
	8	10	0	0	2	2	2	100	Wet	5Y 4/3	0	60	40	0	Loose				As Above
	10	12	2	2	2	2	4	25	Wet	5Y 2.5/2	0	60	40	0	Loose				As Above
	12	14	1	2	2	2	4	20	Sat	5Y 6/4	0	90	10	0	Loose				Pale Olive, SAND, very poorly sorted, coarse grain
	14	16	3	0	1	1	1	70	Sat	5Y 6/4	0	90	10	0	Loose				Pale Olive, SAND, very poorly sorted, coarse grain, with staining
	16	18	1	0	1	1	1	80	Sat	5Y 2.5/2	0	20	60	20	V. Sft				Blk, Clayey SILT
	18	20	0	0	0	0	0	80	Sat	5Y 2.5/2	0	20	60	20	V. Sft				Blk, Clayey SILT, with red and yellow paint chips
	20	22	0	1	2	3	3	80	Sat	5Y 2.5/2	0	20	60	20	V. Sft				As Above
	22	24	2	2	2	4	4	80	Sat	2.5Y 5/2	0	90	10	0	Loose				Light Olive Brn. SAND, very poorly sorted, coarse grain, slight staining
	24	26	3	4	4	5	8	80	Sat	2.5Y 4/1	0	90	10	0	Loose				Dk. Gray, SAND, very poorly sorted, coarse grain, slight staining
	26	28	4	4	5	15	9	90	Sat	2.5Y 4/1	0	90	10	0	Loose				As Above
	28	29	15	25			42	90	Sat	2.5Y 4/1	0	90	10	0	Loose				As Above
	29	30			17	14	42	90	Sat	2.5Y 4/3	0	90	10	0	Loose				Olive Brn. SAND, very poorly sorted, coarse grain
	30	32	7	7	10	11	17	90	Sat	2.5Y 4/3	0	90	10	0	Loose				As Above
	32	34	7	6	7	10	13	90	Sat	2.5Y 4/3	0	90	10	0	Loose				As Above
	34	36	11	12	14	12	26	90	Sat	2.5Y 4/3	0	90	10	0	Loose				As Above
	36	38	10	14	16	18	30	80	Wet	2.5Y 4/3	10	80	10	0	Loose				Olive Brn. SAND, very poorly sorted, coarse grain with gravel
	38	40	13	13	13	15	26	75	Wet	2.5Y 4/3	10	80	10	0	Loose				As Above
	40	42	12	14	10	10	24	100	Wet	5Y 6/4	0	70	30	0	Loose				Pale Olive, Silty SAND, moderatly sorted, fine grain, horizonatal bedding

Continue on Page 2

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Fm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

f.g. m.g., c.g.: Fine-, Medium-, and Coarse-grain size bgs: below ground surface

OVERBURDEN BORING LOG

SITE ID: D202
Page 2 of 2 | DATE: 16 May 05

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	–
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	D2 Former Sludge Disposal Area	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs)	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	50
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well
(X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well
(X) Abandoned by Grout
( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	42	44	6	7	10	10	17	75	Wet	5Y 6/4	0	70	30	0	Loose				Pale Olive, Silty SAND, moderatly sorted, medium grain
	44	46	9	19	15	16	34	75	Wet	5Y 6/4	0	70	30	0	Loose				As Above
	46	48	7	8	9	9	17	100	Wet	5Y 6/4	0	70	30	0	Loose				As Above
	48	50	6	8	12	12	20	75	Wet	5Y 6/4	0	70	30	0	Loose				As Above

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.
f.g., m.g., c.g. : Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)
bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

FSIA Investigation
Cottage Grove, Minnesota

OVERBURDEN BORING LOG

SITE ID:	D203
Page 1 of 2	DATE: 15 May 05

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	--
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	D2 Former Sludge Disposal Area	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs)	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	50
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well
(X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well
(X) Abandoned by Grout
( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Sl	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	2	2	2	6	4	30	Mst	7.5YR 3/3	0	50	40	10	Loose				Dk Br. Silty SAND, poorly sorted, medium grain
	2	4	3	7	7	7	14	50	Mst	7.5YR 3/3	0	50	40	10	Loose	0.0			Dk Br. Silty SAND, poorly sorted, medium grain, with slight staining
	4	5	3	4			11	50	Wet	7.5YR 3/3	0	50	40	10	Loose				As above
	5	6			7	8	11	50	Wet	5Y 4/3	0	10	70	10	V Sft.				Olive, SILT, slight black staining, strong odor
	6	8	1	1	1	6	2	50	Wet	5Y 4/3	0	10	70	10	V Sft.	4.3			As above
	8	10	6	7	5	4	12	50	Mst	5Y 7/1	0	90	10	0	Loose	0.0			Light Gray, SAND, very poorly sorted, coarse grain, slight odor.
	10	12	3	1	1	0	2	75	Wet	5Y 2.5/2	0	15	70	15	V Sft.	86.0			Blk. SILT, strong odor, brown mottling.
	12	13	1	0			1	100	Wet	5Y 7/1	0	60	30	10	Loose				Light Gray, Silty SAND, poorly sorted, medium grain
	13	13.5			1		1	100	Wet.	5Y 2.5/2	0	30	50	20	V Sft.				Blk. Sandy SILT, poorly sorted with organic matter
	13.5	14				0	1	100	Wet	7.5YR 3/3	0	30	30	10	Loose				Dk Br. Silty SAND, very poorly sorted, medium gain, with red and yellow paint chips
	14	15	1	0			0	80	Wet	7.5YR 3/3	0	60	30	10	Loose	133.0			As above
	15	16			0	0	0	80	Wet	5Y 5/4	0	20	50	30	V Sft.				Olive, SILT, slight odor, with orgainic hairs
	16	18	1	1	0	0	1	80	Wet	7.5YR 3/3	30	40	30	0	Loose	279.0			Dk Br. Silty, Gravely, SAND, poorly sorted, with red paint chips
	18	20	1	2	0	0	2	100	Wet	7.5YR 3/3	30	40	30	0	Loose	133.0			As above
	20	22	1	1	0	0	1	100	Wet	7.5YR 3/3	30	40	30	0	Loose				As above
	22	24	0	0	0	0	0	100	Wet	7.5YR 3/3	30	40	30	0	Loose	118.0			As above
	24	25	1	4			17	100	Wet	7.5YR 3/3	30	40	30	0	Loose				As above
	25	26			13	14	17	100	Mst	5Y 7/1	0	90	10	0	Loose	0.0			Light Gray, SAND, well sorted, fine grain
	26	28	11	12	11	9	23	100	Mst	5Y 7/1	0	90	10	0	Loose				As above
	28	30	7	8	9	9	17	100	Mst	5Y 7/1	0	90	10	0	Loose				Light Gray, SAND, moderatly sorted, coarse grain
	30	32	8	13	14	14	27	100	Wet	5Y 4/4	0	50	40	10	Loose	0.0			Olive, Silty, SAND, well sorted, fine grain

Continue on Page 2

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID: D203
Page 2 of 2 | DATE: 16 May 05

CLIENT: Confidential
SITE NAME: Cottage Grove, MN Facility
PROJECT NO.: 02181-002-010-0001
Area Name: D2 Former Sludge Disposal Area
Drilling Contractor: American Engineering & Testing
Drilling Equipment: HSA
Logged By: Ethan Caldwell

ELEV (GRND)ᵃ:
ELEV (TOC)ᵇ: -
NORTHING:
EASTING:
Depth to Water (ft bgs): NM
Total Boring Depth (ft bgs): 50
Depth to Refusal (ft bgs): NA
Boring Diameter (inches): 6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	32	34	8	8	10	12	18	100	Mst	5Y 7/1	0	90	10	0	Loose				Lgt. Gray, SAND, moderatley sorted, medium grain
	34	36	10	12	14	21	26	25	Mst	5Y 7/1	0	90	10	0	Loose				As above
	36	38	6	12	13	13	25	75	Mst	5Y 7/1	0	90	10	0	Loose	0.0			As above
	38	40	4	8	11	13	19	100	Mst	5Y 7/1	0	90	10	0	Loose				As above
	40	42	6	8	10	14	18	50	Mst	5Y 7/1	10	80	10	0	Loose	0.0			Lgt. Gray, SAND, moderatley sorted, medium grain, with granite gravel
	42	44	10	13	14	11	27	100	Mst	5Y 7/1	10	80	10	0	Loose				As above
	44	46	7	8	11	14	19	70	Mst	5Y 7/1	10	80	10	0	Loose				As above
	46	48	10	12	14	16	26	80	Mst	5Y 7/1	10	80	10	0	Loose	0.0			As above
	48	50	9	11	14	18	25	80	Mst	5Y 7/1	10	80	10	0	Loose				As above

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size   bgs: below ground surface

ᵃElevation of Ground Surface given in feet from mean sea level
ᵇElevation of Top of Casing given in feet from mean sea level.
f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)
bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID: FTA 01
Page 1 of 1 DATE: 24 May 05

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	–
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	Fire Training Area	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs):	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	25
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well
(X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well
(X) Abandoned by Grout
( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	2	4	6	6	10	60	Dry	2.5Y 3/3	0	60	30	30	Loose				Olive. Brn. Clayey Silty SAND, poorly sorted, fine grain
	2	4	4	4	5	6	9	40	Dry	2.5Y 3/3	0	60	30	30	Loose				As Above
	4	5	6	9			26	60	Dry	2.5Y 3/3	0	60	30	30	Loose				As Above
	5	6			17	11	26	60	Dry	2.5Y 4/6	30	50	20	0	Loose				Lgt. Ylw. Brn. Gravely Silty SAND, very poorly sorted coarse grain
	6	8	13	15	15	11	30	60	Dry	2.5Y 4/6	30	50	20	0	Loose				As Above
	8	10	10	11	9	11	20	40	Dry	2.5Y 4/6	30	50	20	0	Loose				As Above
	10	12	8	7	10	12	17	30	Mst	2.5Y 4/6	30	50	20	0	Loose				As Above
	12	14	16	8	9	12	17	30	Mst	2.5Y 4/6	30	50	20	0	Loose				As Above
	14	16	10	10	17	18	27	40	Mst	2.5Y 4/6	30	50	20	0	Loose				As Above
	16	18	15	15	10	11	25	60	Mst	2.5Y 4/6	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, fine grain
	18	20	10	9	9	13	18	70	Mst	2.5Y 4/6	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain
	20	22	9	13	14	17	27	50	Mst	2.5Y 4/6	0	80	20	0	Loose				As Above
	22	24	11	14	16	17	30	60	Mst	2.5Y 4/6	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, fine grain
	24	25	10	11			11	80	Mst	2.5Y 4/6	0	80	20	0	Loose				As Above

f.g. m.g. c.g.: Fine-, Medium-, and Coarse-grain size bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID:	**FTA 02**	Page 1 of 1	**DATE:** 23 May 05

CLIENT:	Confidential	**ELEV (GRND)**[a]:	
SITE NAME:	Cottage Grove, MN Facility	**ELEV (TOC)**[b]	–
PROJECT NO.:	02181-002-010-0001	**NORTHING:**	
Area Name:	Fire Training Area	**EASTING:**	
Drilling Contractor:	American Engineering & Testing	**Depth to Water (ft bgs)**	NM
Drilling Equipment:	HSA	**Total Boring Depth (ft bgs)**	25
Logged By:	Ethan Caldwell	**Depth to Refusal (ft bgs):**	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	2	3	3	5	6	70	Mst	5Y 4/4	0	60	30	10	Loose				Olive Silty SAND, moderatly sorted, fine grain
	2	4	2	3	4	5	7	40	Mst	5Y 4/4	0	60	30	10	Loose	0.0			As Above
	4	6	7	12	15	15	26	60	Mst	2.5Y 4/6	10	60	20	10	Loose				Lgt. Ylw. Brn. Silty SAND, very poorly sorted, very coarse grain with gravel
	6	8	10	10	12	15	22	60	Mst	2.5Y 4/6	10	60	20	10	Loose				As Above
	8	10	6	13	13	12	26	25	Mst	2.5Y 4/6	20	50	20	10	Loose				Lgt. Ylw. Brn. Gravely Silty SAND, very poorly sorted, very coarse grain
	10	12	7	7	8	6	15	60	Wet	2.5Y 4/6	10	70	20	0	Loose	0.0			Lgt. Ylw. Brn Silty SAND, poorly sorted, coarse grain, with gravel
	12	14	7	8	9	12	17	70	Wet	2.5Y 4/7	10	70	20	0	Loose				As Above
	14	16	8	10	12	10	22	60	Wet	2.5Y 4/8	10	70	20	0	Loose				As Above
	16	18	7	9	4	7	13	50	Mst	2.5Y 4/9	10	70	20	0	Loose	0.0			Lgt. Ylw. Brn Silty SAND, poorly sorted, medium grain, with gravel
	18	19	11	11	10	14	21	90	Mst	2.5Y 4/10	10	70	20	0	Loose				As Above
	19	20							Mst	2.5Y 4/11	10	70	20	0	Loose				Lgt. Ylw. Brn Silty SAND, poorly sorted, coarse grain, with gravel
	20	22	11	14	17	18	31		Mst	2.5Y 4/12	10	70	20	0	Loose	0.0			Lgt. Ylw. Brn Silty SAND, poorly sorted, medium grain, with gravel
	22	24	9	12	12	18	24		Mst	2.5Y 4/13	10	70	20	0	Loose				As Above
	24	25	14	25			25		Mst	2.5Y 4/14	10	70	20	0	Loose				As Above

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size   bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID: FTA 03
Page 1 of 1 | DATE: 23 May 05

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	--
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	Fire Training Area	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs)	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	25
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well
(X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well
(X) Abandoned by Grout
( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	1	2	1	3	3	80	Wet	5Y 2.5/2	0	70	20	10	Loose				Blk. Silty SAND, poorly sorted, medium/fine grain
	2	4	2	6	10	10	16	90	Dry	5Y 4/3	0	30	40	30	Firm	0.0			Olive Clayey Sandy SILT
	4	6	7	13	11	7	24	80	Dry	2.5Y 4/6	10	60	20	10	Loose				Lgt. Ylw. Brn. Silty SAND, very poorly sorted, very coarse grain with gravel
	6	8	7	5	14	21	19	40	Dry	2.5Y 4/6	30	40	20	10	Loose				Lgt. Ylw. Brn. Silty Gravely SAND, very poorly sorted, very coarse grain with Taconite and Limestone gravels.
	8	10	10	8	9	10	17	60	Dry	2.5Y 4/6	30	40	20	10	Loose				As Above
	10	12	20	13	19	8	32	40	Mst	2.5Y 4/6	30	40	20	10	Loose				As Above
	12	14	13	10	10	10	20	40	Mst	2.5Y 4/6	30	40	20	10	Loose				As Above
	14	16	6	5	6	6	11	80	Mst	2.5Y 4/6	0	80	20	0	Loose	0.0			Lgt. Ylw. Brn. Silty SAND, moderatly sorted, coarse grain
	16	18	6	6	7	9	13	60	Mst	2.5Y 4/6	0	80	20	0	Loose				As Above
	18	20	10	15	12	11	27	80	Mst	2.5Y 4/6	0	80	20	0	Loose				As Above
	20	22	10	12	10	14	22	40	Mst	2.5Y 4/6	0	80	20	0	Loose	0.0			As Above
	22	24	17	12	17	18	29	80	Dry	5Y 6/3	0	70	30	0	Loose				Pale Olive, Silty SAND, well sorted, very fine grain
	24	25	10	6			6	100	Dry	5Y 6/3	0	80	20	0	Loose				As Above

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.
f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)
bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)
f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size
bgs: below ground surface

OVERBURDEN BORING LOG

SITE ID: WPA01
Page 1 of 1 — DATE: 25 May 05

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	–
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	Former Wastewater Pond Area	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs)	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	25
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	0.5					0												ASPHALT
	0.5	1					0												ABC STONE
	1	2			4	6	4	50	Dry	Gley 1 2.5/N	0	50	30	20	Loose				Blk. Clayey Silty SAND, poorly sorted, fine grain
	2	4	7	6	9	12	15	50	Dry	Gley 1 3/2	0	50	30	20	Loose				V. Dk. Grayish Green. Clayey Silty SAND, poorly sorted, fine grain
	4	6	5	10	15	15	25	50	Dry	Gley 1 3/3	0	50	30	20	Loose				As Above
	6	8	6	7	9	12	16	80	Mst	2.5Y 4/4	0	60	30	10	Loose	0.0			Olive Br. Silty SAND, very poorly sorted, medium grain
	8	10	12	15	20	22	35	90	Mst	2.5Y 4/4	0	80	20	0	Loose				Olive Br. Silty SAND, poorly sorted, medium grain
	10	12	7	12	8	15	20	60	Wet	2.5Y 4/4	0	80	20	0	Loose				As Above
	12	14	11	13	12	14	25	80	Wet	2.5Y 4/4	0	80	20	0	Loose	0.0			As Above
	14	16	6	5	8	10	13	80	Wet	2.5Y 4/4	0	80	20	0	Loose				As Above
	16	18	5	6	48	113	54	100	Dry	Gley 2 4/1	0	80	20	0	V. Den				V. Dk. Bluish Gray Silty SAND, poorly sorted, fine grain, strong odor
	18	20	26	17	13	10	30	100	Dry	Gley 2 4/1	0	80	20	0	Dense	90.0			Dk. Bluish Gray, Silty SAND, poorly sorted, fine grain, strong odor
	20	22	9	9	10	11	19	100	Dry	Gley 2 2.5/5PB	0	80	20	0	Loose				Bluish Blk. Silty SAND, poorly sorted, fine grain, strong odor
	22	24	4	4	6	8	10	100	Dry	Gley 2 2.5/5PB	0	80	20	0	Loose	12.0			As Above
	24	25	4	4			4	100	Dry	Gley 2 2.5/5PB	0	80	20	0	Loose				As Above

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size — bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g. : Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs. : below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

FSIA Investigation
Cottage Grove, Minnesota

OVERBURDEN BORING LOG

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	-
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	Building 15	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs):	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs):	25
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

SITE ID: **B1501**

Page 1 of 1 DATE: 25 May 05

Location Type: ( ) GeoProbe ( ) Well
(X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well
(X) Abandoned by Grout
( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	5	7	12	11	19	70	Dry	7.5YR 3/3	10	50	30	10	Loose				Dk. Brn. Silty SAND, very poorly sorted, medium grain
	2	4	8	9	8	7	17	80	Dry	7.5YR 3/3	10	50	30	10	Loose				As Above
	4	6	10	8	7	8	15	80	Dry	7.5YR 3/3	10	50	30	10	Loose	0.0			As Above
	6	8	7	6	4	4	10	60	Mst	7.5YR 3/3	10	50	30	10	Loose				Dk. Brn. Silty SAND, very poorly sorted, coarse grain
	8	10	5	2	2	3	4	70	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			Lgt. Ylw. Brn. Silty SAND, moderatly sorted coarse grain
	10	12	5	2	2	4	4	50	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	12	14	5	3	4	4	7	70	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	14	16	4	4	4	4	8	50	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			As Above
	16	18	4	5	4	5	9	50	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	18	20	5	4	4	5	8	60	Mst	2.5Y 6/4	0	80	20	0	Loose				As Above
	20	22	7	4	4	6	8	80	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			As Above
	22	24	6	6	7	8	13	80	Mst	5Y 6/4	0	80	20	0	Loose	0.0			Pale Olive, Silty SAND, well sorted, very fine grain
	24	25	5	4			4	100	Mst	5Y 6/4	0	80	20	0	Loose				As Above, Terminated boring at 25 fbgs.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size   bgs: below ground surface

[a] Elevation of Ground Surface given in feet from mean sea level.
[b] Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID:	D501
Page 1 of 1	DATE: 20 May 05

CLIENT:	Confidential	ELEV (GRND)[a]:	
SITE NAME:	Cottage Grove, MN Facility	ELEV (TOC)[b]	--
PROJECT NO.:	02181-002-010-0001	NORTHING:	
Area Name:	D5	EASTING:	
Drilling Contractor:	American Engineering & Testing	Depth to Water (ft bgs)	NM
Drilling Equipment:	HSA	Total Boring Depth (ft bgs)	25
Logged By:	Ethan Caldwell	Depth to Refusal (ft bgs):	NA
		Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	1	14	11			11	70	Dry	2.5Y 6/4	15	60	15	10	Loose				Lgt. Ylw. Brn. Gravely Silty SAND, very poorly sorted, coarse grain
	1	1.5			14		25	70	Dry	2.5Y 2.5/4	15	60	15	10	Loose				Dk. Rd. Brn. Gravely Silty SAND, very poorly sorted, coarse grain
	1.5	2				14	25	70	Dry	2.5Y 2.5/4	15	60	15	10	Loose				Olive Brn. Gravely Silty SAND, very poorly sorted, coarse grain
	2	4	7	9	8	9	17	60	Dry	2.5Y 2.5/4	15	60	15	10	Loose				As Above
	4	6	5	7	8	9	15	60	Dry	2.5Y 2.5/4	15	60	15	10	Loose	0.0			As Above
	6	7	5	3			7	60	Dry	2.5Y 2.5/4	15	60	15	10	Loose				As Above
	7	8			4	4	7	60	Dry	5Y 2.5/1	10	60	30	0	Loose	0.0			Blk, Silty SAND, very poorly sorted, medium grain, with gravel
	8	10	5	5	5	4	10	50	Dry	5Y 2.5/1	10	60	30	0	Loose				Blk, Silty SAND, very poorly sorted, medium grain, with gravel, with ash(charcoal)
	10	12	4	4	5	4	9	50	Dry	5Y 2.5/1	10	60	30	0	Loose	0.0			As Above
	12	14	4	3	3	4	6	75	Dry	5Y 2.5/1	10	60	30	0	Loose				As Above
	14	16	7	10	10	10	20	70	Mst	2.5Y 6/4	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain
	16	18	5	5	5	7	10	70	Mst	2.5Y 6/4	0	80	20	0	Loose	0.0			As Above
	18	20	6	7	7	7	14	75	Wet	2.5Y 6/4	0	80	20	0	Loose				As Above
	20	22	6	7	12	15	19	50	Wet	2.5Y 6/4	10	70	10	0	Loose	0.0			Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain, with gravel
	22	24	8	6	5	8	11	20	Wet	2.5Y 6/4	10	70	10	0	Loose				As Above
	24	25	11	8			8	90	Wet	2.5Y 6/4	10	70	10	0	Loose				As Above

f.g. m.g., c.g.: Fine-, Medium-, and Coarse-grain size   bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID: D801
Page 1 of 1 | DATE: 20 May 05

CLIENT: Confidential
SITE NAME: Cottage Grove, MN Facility
PROJECT NO.: 02181-002-010-0001
Area Name: D8
Drilling Contractor: American Engineering & Testing
Drilling Equipment: HSA
Logged By: Ethan Caldwell

ELEV (GRND)[a]:
ELEV (TOC)[b]: --
NORTHING:
EASTING:
Depth to Water (ft bgs): NM
Total Boring Depth (ft bgs): 25
Depth to Refusal (ft bgs): NA
Boring Diameter (inches): 6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well
(X) Abandoned by Grout
( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	1	8	5			5	60	Dry	2.5Y 6/4	15	60	15	10	Loose				Lgt. Ylw. Brn. Gravely Silty SAND, very poorly sorted, coarse grain
	1	2			4	5	4	60	Mst	10YR 4/6	30	40	30	0	Soft				Dk. Ylw. Brn. Clayey Sandy SILT
	2	4	3	4	3	5	7	80	Wet	10YR 4/6	30	40	30	0	Soft	0.0			As Above
	4	6	3	3	5	6	8	80	Wet	10YR 4/6	30	40	30	0	Soft				As Above
	6	8	3	3	4	5	7	50	Wet	10YR 4/6	30	40	30	0	Soft				As Above
	8	10	3	3	3	5	6	80	Wet	10YR 4/6	30	40	30	0	Soft				As Above
	10	12	2	3	3	4	6	80	Sat	10YR 4/6	30	40	30	0	Soft	0.0			As Above
	12	14	1	3	4	5	7	80	Sat	10YR 4/6	30	40	30	0	Soft				As Above
	14	15	5	5			12	80	Sat	GLEY2 5/1	30	40	30	0	Soft	0.0			Bluish Gray Clayey Sandy SILT
	15	16			7	9	12	80	Sat	7.5TR 4/6	0	50	40	10	Loose				Strong Brn. Silty SAND, very fine grain
	16	18	7	8	9	9	17	80	Sat	5Y 4/3	30	40	30	0	Loose	0.0			Olive Silty SAND, very fine grain
	18	20	3	2	5	7	7	90	Sat	5Y 4/3	30	40	30	0	Loose				As Above
	20	22	5	6	8	11	14	90	Sat	5Y 4/3	30	40	30	0	Loose	0.0			As Above
	22	24	7	7	8	9	15	80	Sat	2.5Y 6/4	0	80	20	0	Loose				Lgt. Ylw. Brn. Silty SAND, moderatly sorted, medium grain
	24	25	7	10			10	100	Sat	2.5Y 6/4	0	80	20	0	Loose				As Above

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size
bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.
f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)
bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

OVERBURDEN BORING LOG

SITE ID: BKG01

Page 1 of 1 | DATE: 25 May 05

CLIENT:	Confidential
SITE NAME:	Cottage Grove, MN Facility
PROJECT NO.:	02181-002-010-0001
Area Name:	Back Ground
Drilling Contractor:	American Engineering & Testing
Drilling Equipment:	HSA
Logged By:	Ethan Caldwell

ELEV (GRND)[a]:	
ELEV (TOC)[b]	--
NORTHING:	
EASTING:	
Depth to Water (ft bgs)	NM
Total Boring Depth (ft bgs)	22
Depth to Refusal (ft bgs):	22
Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well
(X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well
(X) Abandoned by Grout
( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	2	5	6	7	11	0											No Recovery
	2	4	4	4	5	8	9	80	Wet	2.5Y 5/6	0	80	20	0	Loose				Lgt. Olive Brn. Silty SAND, poorly sorted, coarse grain
	4	6	6	5	6	6	11	60	Wet	2.5Y 5/6	0	80	20	0	Loose	0.0			As Above
	6	8	4	3	3	2	6	60	Wet	2.5Y 5/6	0	80	20	0	Loose				As Above
	8	10	4	4	5	6	9	60	Wet	2.5Y 5/6	0	80	20	0	Loose				As Above
	10	11	6	5			11	80	Wet	2.5Y 5/6	0	80	20	0	Loose	0.0			As Above
	11	12			6	6	11	80	Wet	2.5Y 6/8	0	50	30	20	Loose				Olive Ylw. Clayey Silty SAND, poorly sorted, medium grain
	12	14	3	3	4	4	7	80	Wet	2.5Y 5/6	0	50	30	20	Loose				As Above
	14	16	3	5	6	7	11	100	Wet	2.5Y 5/6	0	50	30	20	Loose				As Above
	16	18	3	4	6	8	10	100	Wet	2.5Y 5/6	0	50	30	20	Loose				As Above
	18	20	3	5	6	5	11	100	Wet	2.5Y 5/6	0	50	30	20	Loose	0.0			As Above
	20	21	2	12	50/2			100	Wet	2.5Y 5/6	0	50	30	20	Rock				As Above
	21	22							Dry	10YR 7/6					Rock				Weathered carbonate. Terminated boring at 22 fbgs.

Auger Refusal @ 22ft on Bedrock

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs.: below ground surface
Strength (Silt & Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size bgs: below ground surface

FSIA Investigation
Cottage Grove, Minnesota

OVERBURDEN BORING LOG

SITE ID:	BKG02
Page 1 of 1	DATE: 26 May 05

CLIENT:	Confidential
SITE NAME:	Cottage Grove, MN Facility
PROJECT NO.:	02181-002-010-0001
Area Name:	Back Ground
Drilling Contractor:	American Engineering & Testing
Drilling Equipment:	HSA
Logged By:	Ethan Caldwell

ELEV (GRND)[a]:	
ELEV (TOC)[b]	--
NORTHING:	
EASTING:	
Depth to Water (ft bgs)	NM
Total Boring Depth (ft bgs)	23.5
Depth to Refusal (ft bgs):	23.5
Boring Diameter (inches):	6

Location Type: ( ) GeoProbe ( ) Well (X) Soil Boring ( ) Other:
Completion Zone: (X) Overburden ( ) Bedrock
Completion Type: ( ) Monitoring Well (X) Abandoned by Grout ( ) Other (Provide Comments)

ELEV. (ft msl)	Sample Interval (ft bgs)		Blow Count 6"	6"	6"	6"	n-value	Recovery (%)	Moisture	Color Munsell	Grain Size Gr	S	Si	Cl	Strength	OVM Units	Well Column	Soil Sample	Lithic Description
	0	2	1	1	2	4	3	80	Mst	5YR 3/3	10	60	20	10	Loose				Dk. Reddish Brn. Silty SAND, very poorly sorted, coarse grain
	2	4	3	2	4	2	6	60	Mst	5YR 3/3	10	60	20	10	Loose				As Above
	4	6	3	3	2	4	5	50	Mst	5YR 3/3	10	60	20	10	Loose	0.0			As Above
	6	8	5	7	8	9	15	25	Mst	2.5Y 5/6	0	80	20	0	Loose				Lgt. Olive Brn. Silty SAND, moderatly sorted, coarse grain
	8	10	5	6	7	7	13	70	Mst	2.5Y 5/6	0	80	20	0	Loose	0.0			As Above
	10	12	4	6	8	10	14	80	Mst	2.5Y 5/6	0	80	20	0	Loose				As Above
	12	14	6	6	6	10	12	70	Mst	2.5Y 5/6	0	80	20	0	Loose				As Above
	14	16	6	6	7	11	13	70	Mst	2.5Y 5/6	0	80	20	0	Loose	0.0			As Above
	16	18	9	11	17	50/4	28	70	Mst	2.5Y 5/6	0	80	20	0	Loose				Lgt. Olive Brn. Silty SAND, moderatly sorted, coarse grain, with weathered granite on base
	18	20	33	25	27	27	52	70	Mst	2.5Y 5/6	50	30	20	0	Dense	0.0			Lgt. Olive Brn. Sandy GRAVEL, very poorly sorted, rounded gravel, mixed limestone, granite, siltstone, dolomite
	20	22	50	21	20	16	41	50	Mst	2.5Y 5/6	50	30	20	0	Dense				As Above
	22	23.5	15	17	50/2					2.5Y 5/6	50	30	20	0	Dense				As Above. Refusal on weathered carbonate
	Auger Refusal @ 23.5 ft on Bedrock																		

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grain size
bgs: below ground surface

[a]Elevation of Ground Surface given in feet from mean sea level.
[b]Elevation of Top of Casing given in feet from mean sea level.

f.g., m.g., c.g.: Fine-, Medium-, and Coarse-grained
Moisture: Dry, Moist (Mst), Wet, Saturated (Sat)

bgs.: below ground surface
Strength (Silt&Clay): Very Soft (V. Sft), Soft, Firm, Very Firm (V. Frm)
Strength (Sand): Very Loose (V.Los), Loose, Dense, Very Dense (V.Den)

APPENDIX C
ANNUAL REPORT FOR COLLECTIONS UNDER SPECIAL PERMIT NO. 13031

WESTON SOLUTIONS
Weston Solutions, Inc.
1400 Weston Way
P.O. Box 2653
West Chester, Pennsylvania 19380
610-701-3000 • Fax 610-701-3186
www.westonsolutions.com

January 30, 2006

Paul J. Wingate
Fisheries Research Manager
Minnesota Department of Natural Resources
Fish Management Section
Division of Fish and Wildlife
500 Lafayette Road
St. Paul, MN 55155

Re: Annual Report for 2005 Collections under Special Permit No. 13031

Dear Mr. Wingate:

This annual report has been prepared on collections of fish performed in the Mississippi River in the vicinity of Cottage Grove, Minnesota under the scientific collection permit (SCP) Special Permit No. 13031. Prior to the collection effort, the Area Fisheries Manager, Dave Zappetillo, and the Regional Fisheries Manager, Dirk Peterson, were notified of the pending sampling activities. No threatened or endangered species were encountered and all collections were performed in accordance with the SCP conditions.

Fish collections were performed between August 8, 2005 and August 12, 2005 at three reaches adjacent to the 3M Cottage Grove facility. Specimens were collected of smallmouth bass (*Micropterus dolomieu*), channel catfish (*Ictalurus punctatus*) and bluegill sunfish (*Lepomis macrochirus*). Gear types included electrofishing for smallmouth bass and bluegill sunfish and trotlining for catfish. Non-target species were released. A total of 62 fish were collected including 11 smallmouth bass, 30 channel catfish and 21 bluegill sunfish. Whole body or filet tissue samples were prepared from the collected specimens for chemical analyses. A figure showing the collection locations and sample IDs is provided in Attachment 1. Tabulated morphometric data on the fish samples are provided in Attachment 2.

WESTON appreciates the assistance provided by the Department of Natural Resources Division of Fish and Wildlife in providing the SCP for this program. There are no immediate plans for additional collections of aquatic biota. Consequently, there is no present need to renew the SCP for this program. Please feel free to contact me at (610) 701-3787 in the event that you need additional information on the collection activities described above and in the attachments to this letter report.

Very truly yours,

WESTON SOLUTIONS, INC.

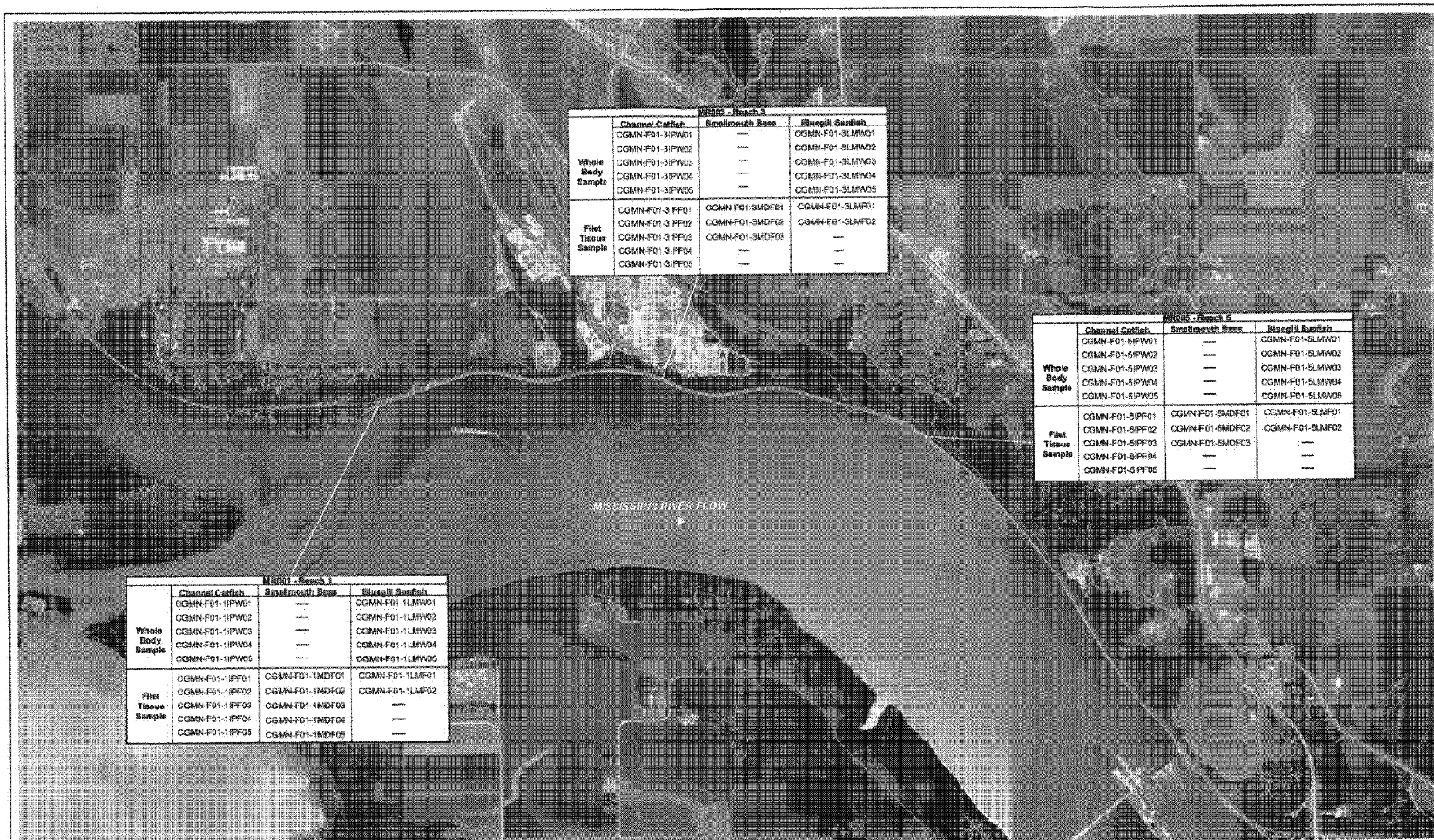
for Charles T. Young
Senior Technical Manager

Attachments

cc: M. Santoro (3M)
R. Paschke (3M)
G. Hohenstein (3M)
J. Kesari (WESTON)

E:\FOLDERS.0-9\3m-cottage grove\Fld_data\SCP_13011_annual_rpt final.doc

ATTACHMENT 1



Legend:

Fish Reach

0 1,000 2,000

Feet

Map Source:
U.S. Department of Agriculture, Farm Services Agency, Aerial Photography Field Office,
National Agricultural Imagery Program (NAIP) Digital Orthorectified Images (DOQ), Minnesota 2003

WESTON

FIGURE 1
AUGUST 2005 FISH SAMPLES
3M COTTAGE GROVE, MN FACILITY

ATTACHMENT 2

Table 1
Fish Whole Body Tissue Samples

Reach 1 - Whole Body Samples

Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)
CGMN-F01-1IPW01-0-050812	Channel catfish	195	174	54
CGMN-F01-1IPW02-0-050812	Channel catfish	343	295	265
CGMN-F01-1IPW03-0-050812	Channel catfish	445	375	600
CGMN-F01-1IPW04-0-050812	Channel catfish	443	395	596
CGMN-F01-1IPW05-0-050812	Channel catfish	550	485	1617
CGMN-F01-1LMW01-0-050812	Bluegill sunfish	124	120	44
CGMN-F01-1LMW02-0-050812	Bluegill sunfish	135	129	50
CGMN-F01-1LMW03-0-050812	Bluegill sunfish	120	112	37
CGMN-F01-1LMW04-0-050812	Bluegill sunfish	129	120	44
CGMN-F01-1LMW05-0-050812	Bluegill sunfish	120	113	32

Reach 3 - Whole Body Samples

Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)
CGMN-F01-3IPW01-0-050812	Channel catfish	222	191	74
CGMN-F01-3IPW02-0-050812	Channel catfish	335	278	252
CGMN-F01-3IPW03-0-050812	Channel catfish	330	279	250
CGMN-F01-3IPW04-0-050812	Channel catfish	505	439	979
CGMN-F01-3IPW05-0-050812	Channel catfish	552	491	1630
CGMN-F01-3LMW01-0-050812	Bluegill sunfish	142	134	64
CGMN-F01-3LMW02-0-050812	Bluegill sunfish	128	121	46
CGMN-F01-3LMW03-0-050812	Bluegill sunfish	140	133	62
CGMN-F01-3LMW04-0-050812	Bluegill sunfish	132	125	575
CGMN-F01-3LMW05-0-050812	Bluegill sunfish	125	120	45

Reach 5 - Whole Body Samples

Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)
CGMN-F01-5IPW01-0-050812	Channel catfish	562	512	1548
CGMN-F01-5IPW02-0-050812	Channel catfish	397	350	481
CGMN-F01-5IPW03-0-050812	Channel catfish	568	515	1643
CGMN-F01-5IPW04-0-050812	Channel catfish	552	491	1440
CGMN-F01-5IPW05-0-050812	Channel catfish	483	450	1100
CGMN-F01-5LMW01-0-050812	Bluegill sunfish	98	94	19
CGMN-F01-5LMW02-0-050812	Bluegill sunfish	122	118	40
CGMN-F01-5LMW03-0-050812	Bluegill sunfish	100	95	21
CGMN-F01-5LMW04-0-050812	Bluegill sunfish	114	109	34
CGMN-F01-5LMW05-0-050812	Bluegill sunfish	100	95	20

Table 2
Fish Filet Tissue Samples

Reach 1 - Filet Tissue Samples - Bass/Sunfish

Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g)
CGMN-F01-1MDF01-0-050812	Smallmouth bass	387	367	692	137
CGMN-F01-1MDF02-0-050812	Smallmouth bass	320	300	454	97
CGMN-F01-1MDF03-0-050812	Smallmouth bass	231	220	178	36
CGMN-F01-1MDF04-0-050812	Smallmouth bass	228	215	162	39
CGMN-F01-1MDF05-0-050812	Smallmouth bass	230	220	166	34
CGMN-F01-1LMF01-0-050812	Bluegill sunfish	180	172	155	29
CGMN-F01-1LMF02-0-050812	Bluegill sunfish	155	148	92	19

Reach 3 - Filet Tissue Samples - Bass/Sunfish

Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g)
CGMN-F01-3MDF01-0-050812	Smallmouth bass	160	156	63	26*
CGMN-F01-3MDF02-0-050812	Smallmouth bass	227	218	175	39
CGMN-F01-3MDF03-0-050812	Smallmouth bass	222	213	175	37
CGMN-F01-3LMF01-0-050812	Bluegill sunfish	145	138	65	24*
CGMN-F01-3LMF02-0-050812	Bluegill sunfish	150	140	75	31*

Reach 5 - Filet Tissue Samples - Bass/Sunfish

Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g)
CGMN-F01-5MDF01-0-050812	Smallmouth bass	220	210	158	34
CGMN-F01-5MDF02-0-050812	Smallmouth bass	250	239	274	59
CGMN-F01-5MDF03-0-050812	Smallmouth bass	240	228	214	46
CGMN-F01-5LMF01-0-050812	Bluegill sunfish	140	135	72	29*
CGMN-F01-5LMF02-0-050812	Bluegill sunfish	139	131	69	29*

Reach 1 - Filet Tissue Samples - Channel Catfish

Sample ID	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g)
CGMN-F01-1IPF01-0-050812	Channel catfish	750	680	4500	861
CGMN-F01-1IPF02-0-050812	Channel catfish	700	630	2800	538
CGMN-F01-1IPF03-0-050812	Channel catfish	540	495	1750	285
CGMN-F01-1IPF04-0-050812	Channel catfish	660	600	2500	428
CGMN-F01-1IPF05-0-050812	Channel catfish	562	500	1750	357

* Both right and left side filets included in sample to provide adequate sample mass for analyses.

Table 2
Fish Filet Tissue Samples

Reach 3 - Filet Tissue Samples - Channel Catfish

Sample ID#	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g) *
CGMN-F01-3IPF01-0-050812	Channel catfish	625	570	2250	317
CGMN-F01-3IPF02-0-050812	Channel catfish	640	573	2500	479
CGMN-F01-3IPF03-0-050812	Channel catfish	700	645	3250	528
CGMN-F01-3IPF04-0-050812	Channel catfish	760	710	3500	540
CGMN-F01-3IPF05-0-050812	Channel catfish	640	580	3000	603

Reach 5 - Filet Tissue Samples - Channel Catfish

Sample ID#	Common Name	Total Length (mm)	Fork Length (mm)	Total Weight (g)	Sample Weight (g)
CGMN-F01-5IPF01-0-050812	Channel catfish	560	500	2000	392
CGMN-F01-5IPF02-0-050812	Channel catfish	670	600	2500	355
CGMN-F01-5IPF03-0-050812	Channel catfish	680	630	3250	646
CGMN-F01-5IPF04-0-050812	Channel catfish	672	630	3250	406
CGMN-F01-5IPF05-0-050812	Channel catfish	620	560	2000	319

* Both right and left side filets included in sample to provide adequate sample mass for analyses.

APPENDIX D
ANALYTICAL DATA PACKAGES

INTERIM REPORT #2 Analysis of Cottage Grove and Woodbury Water Samples

STUDY TITLE

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

DATA REQUIREMENTS

EPA TSCA Good Laboratory Practice Standards 40 CFR 792

STUDY DIRECTOR

Jaisimha Kesari P.E., DEE
Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380
Phone: 610-701-3761

INTERIM REPORT COMPLETION DATE

September 09, 2005

PERFORMING LABORATORY

Exygen Research
3058 Research Drive
State College, PA 16801
Phone: 814-272-1039

STUDY SPONSOR

3M Company
3M Building 0236-01-B-10
St. Paul, MN 55144
Phone: 651-733-6374

PROJECT

Protocol Number: P0001400
Exygen Study Number: P0001400

Total Pages: 115

GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

Exygen Study Number P0001400, entitled "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program," conducted for 3M Company, is being performed in compliance with EPA TSCA Good Laboratory Practice Standards 40 CFR 792 by Exygen Research.

J.M. Flaherty
John Flaherty
Principal Investigator
Exygen Research

9/9/05
Date

Kesari
Jaisimha Kesari P.E., DEE
Study Director
Weston Solutions, Inc.

9/13/05
Date

R.A. Paschke
Robert A. Paschke
Sponsor Representative
3M Company

9/13/05
Date

3MA01551964

2095.0187

QUALITY ASSURANCE STATEMENT

Exygen Research's Quality Assurance Unit reviewed Exygen Study Number P0001400, entitled, "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program". All reviewed phases[1] were inspected for conduct according to Exygen Research's Standard Operating Procedures, the Study Protocol, and all applicable Good Laboratory Practice Standards. All findings were reported to the Exygen Principal Investigator and Management and to the Study Director.

Phase	Date Inspected	Date Reported to Principal Investigator	Date Reported to Exygen Management	Date Reported to Study Director
4. Raw Data Review	05/23-24/05	08/30/05	09/02/05	09/09/05
5. Interim Analytical Report Review	05/25-26/05	08/30/05	09/02/05	09/09/05
8. Interim Analytical Report Review	08/31-09/01/05	09/08/05	09/08/05	09/09/05

Lydia Shaffer
Lydia Shaffer
Technical Lead, Quality Assurance Unit

09/09/05
Date

[1]Note: All in-lab inspections will be documented in the QA statement for the final analytical report at the conclusion of the study. This QA statement involves only the review of the interim report and associated raw data.

CERTIFICATION OF AUTHENTICITY

This interim report, for Exygen Study Number P0001400, is a true and complete representation of the raw data.

Submitted by: Exygen Research
3058 Research Drive
State College, PA 16801
(814) 272-1039

Principal Investigator, Exygen:

John Flaherty
Vice President
Exygen Research

Date 9/9/05

Exygen Research Facility Management:

Richard A. Grazzini
President
Exygen Research

Date 9-SEP-05

Study Director, Weston Solutions, Inc.

Jaisimha Kesari P.E., DEE
Weston Solutions, Inc.

Date 9/13/05

Sponsor Representative, 3M Company:

Robert A. Paschke
Manager, 3M Corporate Environmental Programs

Date 9/13/05

STUDY IDENTIFICATION

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

PROTOCOL NUMBER:	P0001400
EXYGEN STUDY NUMBER:	P0001400
TYPE OF STUDY:	Residue
SAMPLE MATRIX:	Water
TEST SUBSTANCE:	Perfluorooctanoic acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS)
SPONSOR:	3M Company 3M Building 0236-01-B-10 St. Paul, MN 55144
STUDY DIRECTOR:	Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380
STUDY MONITOR:	Robert A. Paschke 3M Company 3M Building 42-02-E-27 St. Paul, MN 55144
PERFORMING LABORATORY:	Exygen Research 3058 Research Drive State College, PA 16801
ANALYTICAL PHASE TIMETABLE:	Study Initiation Date: 03/03/05 Interim Analytical Start Date: 03/28/05 Interim Analytical Termination Date: 08/22/05 Interim Report Completion Date: 09/09/05

PROJECT PERSONNEL

The Study Director for this project is Jaisimha Kesari at Weston Solutions, Inc. The following personnel from Exygen Research were associated with various phases of this interim portion of the study:

Name	Title
John Flaherty	Vice President
Karen Risha	Scientist
Paul Connolly	Technical Lead - LC/MS
Chrissy Edwards	Technician
Brittany Kravets	Technician
Mark Ammerman	Sample Custodian
Amy Sheehan	Associate Scientist
Eric Edwards	Sample Custodian
Shawn Robb	Technical Lead - Facilities
Edward Kaiser	Scientist

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1.0 SUMMARY

Exygen Research extracted and analyzed water samples for the determination of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) according to Exygen Method V0001780 **(Appendix A)**.

The limit of quantitation for PFOA, PFBS, PFHS and PFOS in water was 50 ng/L and the limit of detection for PFOA, PFBS, PFHS and PFOS in water was 25 ng/L.

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS and PFOS in water samples are summarized in **Table I**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in water samples were 116% ± 30, 137% ± 37, 113% ± 20 and 110% ± 31, respectively. The average percent recoveries ± standard deviations for ^{13}C-PFOA in water samples were 99% ± 18.

2.0 OBJECTIVE

The objective of the analytical part of this study was to determine levels of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) in water according to Protocol P0001400 **(Appendix A)**.

3.0 INTRODUCTION

This report details the results of the analysis for the determination of PFOA, PFBS, PFHS and PFOS in water using the analytical method entitled, "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS."

The study was initiated on March 03, 2005, when the study director signed protocol number P0001400. The analytical start date for this interim report was March 28, 2005, and the analytical termination date for this interim report was May 03, 2005.

4.0 ANALYTICAL TEST SAMPLES

One hundred and thirty-eight water samples, which correspond to thirty-three sample sites, (Exygen ID C0065432-C0065506, C0065973-C0065996, C0065930-C0065945, C0065947-C0065969) were received at ambient temperature on March 18, 2005 from Pat Ferretti at 3M Environmental Lab. Twenty-seven water samples, which correspond to six sample sites (Exygen ID C0067856-C0067882) were received at ambient temperature on April 07, 2005 from Pat Ferretti at 3M Environmental Lab. All together, these samples represent thirty-nine sample sites and associated field QC samples. The samples were logged in by Exygen personnel and placed in refrigerated storage.

Sample log-in and chain of custody information is located in the raw data package associated with this interim report. Storage records will be kept at Exygen Research.

5.0 REFERENCE MATERIAL

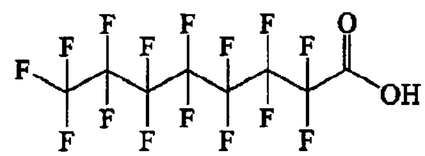
The analytical standard, PFOA, was purchased from Sigma Aldrich and was received at Exygen on December 08, 2003. The surrogate spiking standard, ^{13}C labeled perfluorooctanoic acid (^{13}C PFOA), was received at Exygen on April 15, 2004 from the 3M Company. 3M supplied the analytical standards PFBS and PFHS. PFBS was received from 3M at Exygen on July, 06, 2000. PFHS was received from 3M at Exygen on January 20, 2003. PFOS was purchased from Fluka Corporation and was received at Exygen on April 23, 2003.

The available information for the reference materials is listed below. PFOA was stored ambient. PFBS, PFHS and ^{13}C PFOA were stored frozen and PFOS was stored refrigerated.

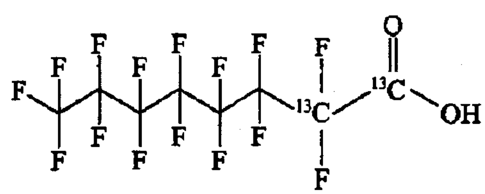
Compound	Exygen Inventory No..	Lot #	Purity (%)	Expiration Date
PFOA	SP0003800	23116HB	97.64	12/08/05
^{13}C PFOA	SP0004184	3507-195	97	03/29/09
PFBS	SP0000252	101	96.7	12/04/06
PFHS	SP0002401	SE036	98.6	10/18/06
PFOS	SP0002694	430180-1	101.2	04/23/06

The molecular structures of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS are given on the following pages:

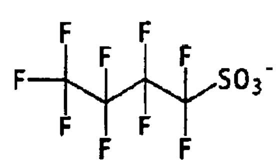
PFOA
Chemical Name: Perfluorooctanoic acid
Molecular Weight: 414
Transitions Monitored: 413 → 369 (for quantification) and
413 → 219 (for confirmation)
Structure:



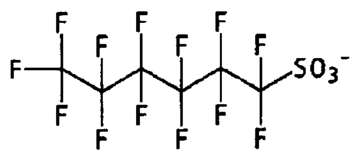
^{13}C PFOA
Chemical Name: 1,2-13C perfluorooctanoic acid
Molecular Weight: 416
Transition Monitored: 415 → 370
Structure:



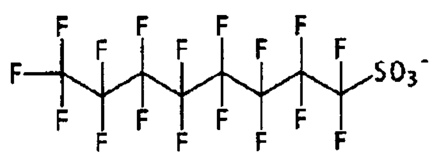
PFBS
Chemical Name: Perfluorobutanesulfonate
Molecular Weight: 338 supplied as the potassium salt ($C_4F_9SO_3^-K^+$)
Transitions Monitored: 299 → 99
Structure:



PFHS
Chemical Name: Perfluorohexanesulfonate
Molecular Weight: 438 supplied as the potassium salt ($C_6F_{13}SO_3^-K^+$)
Transitions Monitored: 399 → 80
Structure:



PFOS
Chemical Name: Perfluorooctanesulfonate
Molecular Weight: 538 supplied as the potassium salt ($C_8F_{17}SO_3^-K^+$)
Transitions Monitored: 499 → 80
Structure:



6.0 DESCRIPTION OF ANALYTICAL METHOD

The analytical method "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS" was used for this study.

6.1. Extraction Procedure

A 40 mL aliquot of the water sample was used for the extraction procedure. After fortification of appropriate samples, the samples were loaded onto a C_{18} SPE cartridge conditioned with 10 mL of methanol and 5 mL of water. The eluate was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of eluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

6.2 Preparation of Standards and Fortification Solutions

Individual stock standard solutions of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS were prepared as specified in Exygen method V0001780. The stock standard solutions were prepared at a concentration of 100 µg/mL by dissolving 10 mg of each of the standard (corrected for purity and salt content, if necessary) in methanol. From these solutions, 1.0 µg/mL fortification standard solutions were prepared by taking 1 mL of the appropriate stock and bringing the volume up to 100 mL with methanol. By taking 10 mL of the appropriate 1.0 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, 0.1 µg/mL fortification standards were prepared. By taking 10 mL of the appropriate 0.1 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, 0.01 µg/mL fortification standards were prepared.

Several sets of standards containing PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS were prepared in water and processed through the extraction procedure, identical to samples. The following concentrations were prepared:

Conc. of Fort Solution (ng/mL)[1]	Fort Volume (µL)	Volume of Fortified Sample (mL)	Final Conc. of Calibration Std. (ng/L)
0	0	40	0
10	100	40	25
10	200	40	50
10	400	40	100
100	100	40	250
100	200	40	500
100	400	40	1000

[1] of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS

An additional mixed stock solution of PFOA, ^{13}C PFOA, PFBS, PFHS, and PFOS was prepared at 1000 µg/mL and diluted to 100 and 10 µg/mL for bottle spiking purposes. Complete details can be found in the raw data package associated with this study.

The stock standard solution and all fortification and calibration standard solutions were stored in a refrigerator (4° ± 2°C) when not in use. Documentation of standard preparation is located in the raw data package associated with this interim report.

6.3 Chromatography

Quantification of PFOA, PFBS, PFHS and PFOS was accomplished by LC/MS/MS electrospray. The retention time of PFOA, PFBS, PFHS and PFOS was ~12 min, ~3 mins, ~10 mins, and ~13 mins, respectively. Peaks above the LOD were not detected in any of the reagent blank samples corresponding to the analyte retention time.

6.4 Instrument Sensitivity

The smallest standard amount injected during the chromatographic run had a concentration of 25 ng/L of PFOA, PFBS, PFHS and PFOS.

6.5 Description of LC/MS/MS Instrument and Operating Conditions

Instrument: API 4000 Biomolecular Mass Analyzer

Interface: Turbo Ion Spray Liquid Introduction Interface

Computer: DELL OptiPlex GX400

Software: Windows NT, Analyst 1.4.1

HPLC: Hewlett Packard (HP) Series 1100
HP Quat Pump
HP Vacuum Degasser
HP Autosampler
HP Column Oven

HPLC Column: Thermo Fluophase RP, 50 mm x 2.1 mm
Column Temp.: 30° C
Injection Vol.: 15 µL
Mobile Phase (A): 2 mM Ammonium Acetate in water
Mobile Phase (B): Methanol

Time (min)	% A	% B
0.0	65	35
1.0	65	35
8.0	25	75
10.0	25	75
11.0	65	35
18.0	65	35

Total run time: ~18 min
Flow Rate: 0.3 mL/min
Ions monitored:

Analyte	Mode	Transition Monitored	Approximate Retention Time (min)
PFOA	negative	413 → 369	~12 min.
PFOA Confirm Ion	negative	413 → 219	~12 min.
^{13}C PFOA	negative	415 → 370	~12 min.
PFBS	negative	299 → 99	~3 min.
PFHS	negative	399 → 80	~10 min.
PFOS	negative	499 → 80	~13 min.

6.6 Quantitation and Example Calculation

Fifteen microliters of sample or calibration standard were injected into the LC/MS/MS. The peak area was measured and the standard curve was generated (using 1/x fit weighted linear regression) by Analyst software using six concentrations of standards. The concentration was determined from the equations below.

Equation 1 calculated the amount of analyte found (in ng/L, based on peak area) using the standard curve (linear regression parameters) generated by the Analyst software program.

Equation 1:

$$\text{Analyte found (ng/L)} = \frac{(\text{Peak area} - \text{intercept})}{\text{slope}} \times \text{DF}$$

Where: DF = Dilution Factor, factor by which the final volume was diluted, if necessary.

For samples fortified with known amounts of PFOA, PFBS, PFHS, PFOS and ^{13}C PFOA prior to extraction, Equation 2 was used to calculate the percent recovery.

Equation 2:

Recovery (%) =

$$\frac{(\text{analyte found (ng/L)} - \text{analyte in control (ng/L)})}{\text{amount added (ng/L)}} \times 100\%$$

An example of a calculation using an actual sample and results from the PFOA analysis follows (values may differ slightly from the raw data due to rounding differences):

Water sample Exygen ID C0065436 Spk F (Set: 032805C), fortified at 10000 ng/L with PFOA where:

peak area	=	161009
intercept	=	0.0153
slope	=	1530
dilution factor	=	100
ng/L PFOA added (fort level)	=	10000
amt in corresponding sample (ng/L)*	=	0 (Not Detected)

(*The primary sample result was used for all calculations)

From equation 1:

$$\text{Analyte found (ng/L)} = \frac{[161009 - 0.0153]}{1530} \times 100$$

$$= 10523 \text{ ng/L}$$

From equation 2:

$$\%\ \text{Recovery} = \frac{(10523 \text{ ng/L} - 0 \text{ ng/L})}{10000 \text{ ng/L}} \times 100\%$$

$$= 105\ \%$$

7.0 EXPERIMENTAL DESIGN

^{13}C PFOA was used as a surrogate for all the samples. ^{13}C PFOA was added to the sample collection bottles in the laboratory before being shipped to the field for sampling. For samples designated as field matrix spikes PFOA, PFBS, PFHS, and PFOS were also added at a known concentration to the bottles in the laboratory before being shipped to the field. The samples were filled to a 200 mL volumetric fill line in the field.

The samples were extracted in eight sets. Each set included one reagent blank and two reagent spikes fortified at known concentrations. The first three sets contained six sample sites each. The fourth and fifth sets contained five sample sites each, along with a trip blank and two trip blank spikes in each set. The sixth set contained five sample sites, while the seventh set contained three sample sites. The eighth set contained three sample sites, along with a trip blank and two trip blank spikes. For each site, a sample, a field duplicate and two-matrix field spikes were collected. For each site, a laboratory duplicate of the primary sample was extracted and two laboratory matrix spikes were also extracted. For the two laboratory matrix spikes, two 40 mL portions of the primary sample collected for the site were poured from the bottle and fortified. Not only were PFBS, PFHS, PFOS and PFOA added in the laboratory prior to extraction, but also ^{13}C PFOA was added. The additional ^{13}C PFOA was added to the laboratory matrix spikes because the levels of PFBS, PFHS, PFOS and PFOA spiked into the samples were known to exceed the calibration ranges and were not analyzed without dilution; therefore, ^{13}C PFOA levels were adjusted to require the same dilution as the other analytes.

Accuracies were assessed for each sample by reviewing the individual QC results obtained for each sample site. In most cases, there were two laboratory and two field spike recovery results available for each sample site that were used to assess the accuracy. There were seven individual ^{13}C PFOA recovery results per site that were also used to assess the accuracy. In the cases where the lab and field QC could not be calculated, the ^{13}C PFOA recoveries alone were used to access accuracy.

8.0 RESULTS

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in water samples are summarized in **Table I.**

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the water samples are detailed in **Tables II** and **III**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in water samples were 116% ± 30, 137% ± 37, 113% ± 20 and 110% ± 31, respectively. Fortification recoveries for ^{13}C PFOA in the water samples are detailed in **Table IV**. The average percent recoveries ± standard deviations for ^{13}C-PFOA in water samples were 99% ± 18.

For each primary sample collected, between the field and lab, seven individual QC results were reported for ^{13}C PFOA. Some samples gave recoveries for ^{13}C PFOA outside of the normal acceptance range of 70-130%. Because laboratory control spikes for ^{13}C PFOA were acceptable in every set, instrument washes were free of ^{13}C PFOA, at least one ^{13}C PFOA recovery per the seven done for the sample was acceptable and no evident errors in spiking or extracting could be found, no re-extractions were performed, except for the low lab spike of WBMN-GW-R1-O-050314 and the low field spike of CGMN-GW-MW5-LS-050316. ^{13}C PFOA recoveries outside of 70-130% are deemed indicative of matrix effects.

9.0 CONCLUSIONS

The water samples were successfully extracted and analyzed for PFOA, PFBS, PFHS and PFOS according to analytical method V0001780. There were no circumstances that may have affected the data quality or integrity.

10.0 RETENTION OF DATA AND SAMPLES

All original paper data generated by Exygen Research that pertains to this interim report will be shipped to the sponsor. This does not include facility-specific raw data such as instrument or temperature logs. Exact copies of all raw data, as well as a signed copy of the interim analytical report and all original facility-specific raw data, will be retained in the Exygen Research archives for the period of time specified in EPA TSCA Good Laboratory Practice Standards 40 CFR 792.

TABLES

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Water Samples

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)
C0065432	WBMN-GW-R1-O-050314	3700	100/50	2480	30/30	55.8	30/30	2200	30/30
C0065432 Rep	WBMN-GW-R1-O-050314*	3510	100/50	2630	30/30	68.5	30/30	2220	30/30
C0065433	WBMN-GW-R1-DP-050314	3200	100/50	2730	30/30	81.6	30/30	2540	30/30
C0065436	WBMN-GW-R2-O-050314	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0065436 Rep	WBMN-GW-R2-O-050314*	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0065437	WBMN-GW-R2-DP-050314	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0065440	WBMN-GW-R3-O-050314	482	100/50	1170	30/30	116	30/30	159	30/30
C0065440 Rep	WBMN-GW-R3-O-050314*	477	100/50	1180	30/30	110	30/30	156	30/30
C0065441	WBMN-GW-R3-DP-050314	476	100/50	1170	30/30	99.5	30/30	144	30/30
C0065444	WBMN-GW-R4-O-050314	10900	100/50	19700	60/60	2480	40/40	2860	30/30
C0065444 Rep	WBMN-GW-R4-O-050314*	11100	100/50	19700	60/60	2240	40/40	2840	30/30
C0065445	WBMN-GW-R4-DP-050314	11000	100/50	19700	60/60	2160	40/40	2770	30/30
C0065448	WBMN-GW-CWM-O-050314	6020	100/50	10000	30/30	1150	30/30	1870	30/30
C0065448 Rep	WBMN-GW-CWM-O-050314*	6130	100/50	11000	30/30	1210	30/30	2040	30/30
C0065449	WBMN-GW-CWM-DP-050314	6110	100/50	9880	30/30	1340	30/30	1980	30/30
C0065452	CGMN-GW-MW14-O-050316	599000	100/50	28900	30/30	74800	30/30	967000	50/50
C0065452 Rep	CGMN-GW-MW14-O-050316*	644000	100/50	31300	30/30	80500	30/30	990000	50/50
C0065453	CGMN-GW-MW14-DP-050316	567000	100/50	28600	30/30	82500	30/30	944000	50/50
C0065456	CGMN-GW-MW10-O-050316	16100	100/50	386	30/30	2240	50/50	2220	50/50
C0065456 Rep	CGMN-GW-MW10-O-050316*	17200	100/50	400	30/30	2050	50/50	2260	50/50
C0065457	CGMN-GW-MW10-DP-050316	16100	100/50	372	30/30	2160	50/50	2190	50/50
C0065460	CGMN-GW-MW4-O-050316	16100	100/50	2220	30/30	179	30/30	10700	30/30
C0065460 Rep	CGMN-GW-MW4-O-050316*	15800	100/50	2110	30/30	154	30/30	9470	30/30
C0065461	CGMN-GW-MW4-DP-050316	14500	100/50	2070	30/30	170	30/30	9310	30/30
C0065464	CGMN-GW-MW3-O-050316	399	100/50	362	30/30	184	30/30	8140	30/30
C0065464 Rep	CGMN-GW-MW3-O-050316*	404	100/50	349	30/30	205	30/30	8150	30/30
C0065465	CGMN-GW-MW3-DP-050316	379	100/50	344	30/30	208	30/30	8430	30/30
C0065468	CGMN-GW-MW1-O-050316	78.4	100/50	58.7	30/30	667	40/40	1130	30/30
C0065468 Rep	CGMN-GW-MW1-O-050316*	75.0	100/50	56.9	30/30	657	40/40	1110	30/30
C0065469	CGMN-GW-MW1-DP-050316	73.5	100/50	58.6	30/30	733	40/40	1190	30/30
C0065472	CGMN-GW-MW5-O-050316	NQ	100/50	ND	30/30	142	30/30	746	30/30
C0065472 Rep	CGMN-GW-MW5-O-050316*	NQ	100/50	ND	30/30	139	30/30	724	30/30
C0065473	CGMN-GW-MW5-DP-050316	NQ	100/50	NQ	30/30	170	30/30	776	30/30
C0065476	CGMN-GW-MW7-O-050316	NQ	100/50	ND	30/30	101	30/30	237	30/30
C0065476 Rep	CGMN-GW-MW7-O-050316*	51.6	100/50	ND	30/30	135	30/30	294	30/30
C0065477	CGMN-GW-MW7-DP-050316	50.5	100/50	ND	30/30	150	30/30	314	30/30
C0065480	CGMN-GW-MW2-O-050315	NQ	100/50	NQ	30/30	ND	30/30	1500	30/30
C0065480 Rep	CGMN-GW-MW2-O-050315*	NQ	100/50	53.9	30/30	ND	30/30	1830	30/30
C0065481	CGMN-GW-MW2-DP-050315	50.2	100/50	52.4	30/30	ND	30/30	1680	30/30
C0065484	CGMN-GW-MW9-O-050315	124	100/50	353	30/30	237	30/30	935	50/50
C0065484 Rep	CGMN-GW-MW9-O-050315*	139	100/50	361	30/30	248	30/30	957	50/50
C0065485	CGMN-GW-MW9-DP-050315	124	100/50	359	30/30	312	30/30	996	50/50

*Laboratory Duplicate
ND = Not detected at or above 25 ng/L.
NQ = Not quantifiable = Measured concentration between 25 ng/L and the Limit of Quantitation (LOQ) which is 50 ng/L.

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Water Samples Continued

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)
C0065488	CGMN-GW-MW12-O-050315	194000	100/50	49400	30/30	219000	40/40	2140000	40/40
C0065488 Rep	CGMN-GW-MW12-O-050315*	211000	100/50	49700	30/30	224000	40/40	2240000	40/40
C0065489	CGMN-GW-MW12-DP-050315	135000	100/50	32300	30/30	151000	40/40	1210000	40/40
C0065492	CGMN-GW-PZ14-O-050315	359	100/50	496	30/30	543	50/50	2710	60/60
C0065492 Rep	CGMN-GW-PZ14-O-050315*	375	100/50	501	30/30	554	50/50	2020	60/60
C0065493	CGMN-GW-PZ14-DP-050315	381	100/50	556	30/30	601	50/50	2400	60/60
C0065496	CGMN-GW-MW17-O-050315	393	100/50	488	30/30	595	40/40	1760	30/30
C0065496 Rep	CGMN-GW-MW17-O-050315*	414	100/50	495	30/30	577	40/40	1810	30/30
C0065497	CGMN-GW-MW17-DP-050315	400	100/50	479	30/30	649	40/40	1820	30/30
C0065500	CGMN-GW-MW18-O-050315	348	100/50	902	40/40	777	40/40	2140	50/50
C0065500 Rep	CGMN-GW-MW18-O-050315*	349	100/50	948	40/40	879	40/40	3200	50/50
C0065501	CGMN-GW-MW18-DP-050315	388	100/50	1090	40/40	975	40/40	2370	50/50
C0065504	CGMN-GW-TRIP2-O-050315	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0065973	CGMN-GW-MW11-O-050312	12800	100/50	1990	30/30	10900	30/30	69500	30/30
C0065973 Rep	CGMN-GW-MW11-O-050312*	13400	100/50	1910	30/30	10800	30/30	70200	30/30
C0065974	CGMN-GW-MW11-DP-050312	12800	100/50	1990	30/30	11700	30/30	72400	30/30
C0065977	CGMN-GW-MW101-O-050312	28400	100/50	1690000	30/30	341000	80/80	157000	50/50
C0065977 Rep	CGMN-GW-MW101-O-050312*	26200	100/50	1500000	30/30	299000	80/80	147000	50/50
C0065978	CGMN-GW-MW101-DP-050312	25700	100/50	1560000	30/30	333000	80/80	145000	50/50
C0065981	CGMN-GW-MW102-O-050312	38400	100/50	92400	100/50	45900	70/70	175000	80/80
C0065981 Rep	CGMN-GW-MW102-O-050312*	36500	100/50	86200	100/50	50200	70/70	159000	80/80
C0065982	CGMN-GW-MW102-DP-050312	38500	100/50	82200	100/50	53200	70/70	156000	80/80
C0065985	CGMN-GW-MW13-O-050312	1240	100/50	1570	100/50	13400	50/50	15500	60/60
C0065985 Rep	CGMN-GW-MW13-O-050312*	1260	100/50	1600	100/50	14000	50/50	15500	60/60
C0065986	CGMN-GW-MW13-DP-050312	1640	100/50	2430	100/50	22000	50/50	26000	60/60
C0065989	CGMN-GW-MW16-O-050312	14000	100/50	1990	100/50	41100	50/50	24000	50/50
C0065989 Rep	CGMN-GW-MW16-O-050312*	14000	100/50	1830	100/50	32000	50/50	22300	50/50
C0065990	CGMN-GW-MW16-DP-050312	12200	100/50	1670	100/50	28400	50/50	18100	50/50
C0065993	CGMN-GW-MW15-O-050312	1920	100/50	535	30/30	11300	100/50	6390	30/30
C0065993 Rep	CGMN-GW-MW15-O-050312*	2020	100/50	539	30/30	10700	100/50	6440	30/30
C0065994	CGMN-GW-MW15-DP-050312	1890	100/50	536	30/30	13200	100/50	6620	30/30
C0065930	CGMN-GW-TRIP1-O-050314	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0065933	CGMN-GW-PW1-O-050314	516	100/50	170	30/30	457	30/30	3320	30/30
C0065933 Rep	CGMN-GW-PW1-O-050314*	533	100/50	165	30/30	444	30/30	3330	30/30
C0065934	CGMN-GW-PW1-DP-050314	524	100/50	167	30/30	486	30/30	3380	30/30
C0065937	CGMN-GW-PW2-O-050314	255	100/50	167	30/30	573	30/30	3880	30/30
C0065937 Rep	CGMN-GW-PW2-O-050314*	238	100/50	170	30/30	658	30/30	3850	30/30
C0065938	CGMN-GW-PW2-DP-050314	252	100/50	180	30/30	756	30/30	4310	30/30
C0065941	CGMN-GW-PW3-O-050314	ND	100/50	ND	30/30	ND	50/50	523	30/30
C0065941 Rep	CGMN-GW-PW3-O-050314*	NQ	100/50	ND	30/30	ND	50/50	603	30/30
C0065942	CGMN-GW-PW3-DP-050314	NQ	100/50	ND	30/30	ND	50/50	650	30/30

*Laboratory Duplicate
ND = Not detected at or above 25 ng/L.
NQ = Not quantifiable = Measured concentration between 25 ng/L and the Limit of Quantitation (LOQ) which is 50 ng/L.

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Water Samples Continued

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / -%)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / -%)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / -%)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / -%)
C0065945	CGMN-GW-PW4-O-050314	114	100/50	158	30/30	ND	30/30	1190	40/40
C0065945 Rep	CGMN-GW-PW4-O-050314*	123	100/50	149	30/30	ND	30/30	1210	40/40
C0065947	CGMN-GW-PW4-DP-050314	118	100/50	165	30/30	ND	30/30	1270	40/40
C0065950	CGMN-GW-PW5-O-050314	2240	100/50	1910	30/30	4340	30/30	14800	30/30
C0065950 Rep	CGMN-GW-PW5-O-050314*	2160	100/50	1930	30/30	4460	30/30	14500	30/30
C0065951	CGMN-GW-PW5-DP-050314	2270	100/50	1800	30/30	4200	30/30	14500	30/30
C0065954	CGMN-GW-PW6-O-050314	48500	100/50	4820	30/30	33300	30/30	158000	30/30
C0065954 Rep	CGMN-GW-PW6-O-050314*	47400	100/50	4730	30/30	32400	30/30	151000	30/30
C0065955	CGMN-GW-PW6-DP-050314	47800	100/50	4780	30/30	33000	30/30	157000	30/30
C0065958	CGMN-GW-PW8-O-050314	NQ	100/50	ND	30/30	ND	30/30	570	30/30
C0065958 Rep	CGMN-GW-PW8-O-050314*	NQ	100/50	ND	30/30	ND	30/30	646	30/30
C0065959	CGMN-GW-PW8-DP-050314	NQ	100/50	ND	30/30	ND	30/30	623	30/30
C0065962	CGMN-GW-B116-O-050314	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0065962 Rep	CGMN-GW-B116-O-050314*	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0065963	CGMN-GW-B116-DP-050314	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0065966	CGMN-PW-CWD-O-050314	5750	100/50	8410	30/30	1150	30/30	3030	30/30
C0065966 Rep	CGMN-PW-CWD-O-050314*	5650	100/50	8430	30/30	1320	30/30	3200	30/30
C0065967	CGMN-PW-CWD-DP-050314	5450	100/50	8570	30/30	1560	30/30	3320	30/30
C0067856	CGMN-GW-CWD-O-050405	7290	100/50	9910	30/30	1430	30/30	2720	30/30
C0067856 Rep	CGMN-GW-CWD-O-050405*	7350	100/50	9510	30/30	1260	30/30	2590	30/30
C0067857	CGMN-GW-CWD-DP-050405	7390	100/50	9400	30/30	1140	30/30	2520	30/30
C0067860	WBMN-GW-CWM-O-050405	7350	100/50	11800	30/30	1260	30/30	2230	30/30
C0067860 Rep	WBMN-GW-CWM-O-050405*	6880	100/50	10800	30/30	1080	30/30	2010	30/30
C0067861	WBMN-GW-CWM-DP-050405	7550	100/50	12500	30/30	1260	30/30	2310	30/30
C0067864	WBMN-GW-R-2-O-050405	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0067864 Rep	WBMN-GW-R-2-O-050405*	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0067865	WBMN-GW-R-2-DP-050405	ND	100/50	ND	30/30	ND	30/30	ND	30/30
C0067868	WBMN-GW-R-3-O-050405	360	100/50	1290	30/30	143	30/30	191	30/30
C0067868 Rep	WBMN-GW-R-3-O-050405*	364	100/50	1160	30/30	137	30/30	182	30/30
C0067869	WBMN-GW-R-3-DP-050405	375	100/50	1150	30/30	153	30/30	188	30/30
C0067872	WBMN-GW-R-1-O-050405	1880	100/50	2310	30/30	NQ	30/30	2060	60/60
C0067872 Rep	WBMN-GW-R-1-O-050405*	1950	100/50	2410	30/30	57.3	30/30	2330	60/60
C0067873	WBMN-GW-R-1-DP-050405	1860	100/50	2620	30/30	67.2	30/30	2610	60/60
C0067876	WBMN-GW-R-4-O-050405	6050	100/50	20100	30/30	2340	30/30	3120	30/30
C0067876 Rep	WBMN-GW-R-4-O-050405*	6420	100/50	20800	30/30	2080	30/30	3070	30/30
C0067877	WBMN-GW-R-4-DP-050405	6250	100/50	20400	30/30	2180	30/30	3180	30/30
C0067882	WBMN-GW-Field-Blank-050405	ND	100/50	ND	30/30	ND	30/30	ND	30/30

*Laboratory Duplicate
ND = Not detected at or above 25 ng/L.
NQ = Not quantifiable = Measured concentration between 25 ng/L and the Limit of Quantitation (LOQ) which is 50 ng/L.

Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples

Sample Description	C4 Sulfonate PFBS				C6 Sulfonate PFHS			
	Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
WBMN-GW-R1-DP-050314 (C0005433 Spk C, 1000 ng/L Lab Spike)	1000	3700	3130	*	1000	2480	3680	120
WBMN-GW-R1-O-050314 (C0005432 Spk D, 10000 ng/L Lab Spike)	10000	3700	15000	113	10000	2480	12900	104
WBMN-GW-R1-LS-050314 Low Spike 1 ppb (C0005434, 1000 ng/L Field Spike)	1000	3700	4170	*	1000	2480	3680	120
WBMN-GW-R1-HS-050314 High Spike 10 ppb (C0005435, 10000 ng/L Field Spike)	10000	3700	15400	117	10000	2480	13500	110
WBMN-GW-R2-O-050314 (C0005436 Spk E, 1000 ng/L Lab Spike)	1000	ND	1350	135	1000	ND	1090	109
WBMN-GW-R2-O-050314 (C0005436 Spk F, 10000 ng/L Lab Spike)	10000	ND	13400	134	10000	ND	10800	108
WBMN-GW-R2-LS-050314 Low Spike 1 ppb (C0005438, 1000 ng/L Field Spike)	1000	ND	1280	128	1000	ND	1210	121
WBMN-GW-R2-HS-050314 High Spike 10 ppb (C0005439, 10000 ng/L Field Spike)	10000	ND	13300	133	10000	ND	11400	114
WBMN-GW-R3-O-050314 (C0005440 Spk G, 1000 ng/L Lab Spike)	1000	482	1820	134	1000	1170	2480	131
WBMN-GW-R3-O-050314 (C0005440 Spk H, 10000 ng/L Lab Spike)	10000	482	14300	138	10000	1170	12000	108
WBMN-GW-R3-LS-050314 Low Spike 1 ppb (C0005442, 1000 ng/L Field Spike)	1000	482	1790	131	1000	1170	2390	122
WBMN-GW-R3-HS-050314 High Spike 10 ppb (C0005443, 10000 ng/L Field Spike)	10000	482	13700	132	10000	1170	12400	112
WBMN-GW-R4-O-050314 (C0005444 Spk I, 1000 ng/L Lab Spike)	1000	10900	8820	*	1000	19700	23300	*
WBMN-GW-R4-O-050314 (C0005444 Spk J, 10000 ng/L Lab Spike)	10000	10900	21600	107	10000	19700	31300	116
WBMN-GW-R4-LS-050314 Low Spike 1 ppb (C0005446, 1000 ng/L Field Spike)	1000	10900	8010	*	1000	19700	23500	*
WBMN-GW-R4-HS-050314 High Spike 10 ppb (C0005447, 10000 ng/L Field Spike)	10000	10900	24000	131	10000	18700	36700	160
WBMN-GW-CWM-O-050314 (C0005448 Spk K, 1000 ng/L Lab Spike)	1000	6020	5680	*	1000	10000	11200	*
WBMN-GW-CWM-O-050314 (C0005448 Spk L, 10000 ng/L Lab Spike)	10000	6020	16800	108	10000	10000	21700	117
WBMN-GW-CWM-LS-050314 Low Spike 1 ppb (C0005450, 1000 ng/L Field Spike)	1000	6020	5740	*	1000	10000	11200	-
WBMN-GW-CWM-HS-050314 High Spike 10 ppb (C0005451, 10000 ng/L Field Spike)	10000	6020	18300	123	10000	10000	22500	125
CGMN-GW-MW14-O-050316 (C0005452 Spk M, 100000 ng/L Lab Spike)	100000	599000	810000	*	100000	28900	138000	109
CGMN-GW-MW14-O-050316 (C0005452 Spk N, 1000000 ng/L Lab Spike)	1000000	599000	1820000	122	1000000	28900	1110000	108
CGMN-GW-MW14-LS-050316 Low Spike 100 ppb (C0005454, 100000 ng/L Field Spike)	100000	599000	624000	*	100000	28900	156000	127
CGMN-GW-MW14-HS-050316 High Spike 1000 ppb (C0005455, 1000000 ng/L Field Spike)	1000000	599000	1900000	130	1000000	28900	1200000	117

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 25 ng/L (ppt).

NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-GW-MW10-O-050316 ([illegible] Spk C, 1000 ng/L Lab Spike)	1000	16100	19000	*	1000	386	1490	110
CGMN-GW-MW10-O-050316 ([illegible] Spk D, 10000 ng/L Lab Spike)	10000	16100	23600	75	10000	386	9760	94
CGMN-GW-MW10-LS-050316 Low Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	16100	17300	*	1000	386	1520	113
CGMN-GW-MW10-HS-050316 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	16100	25300	92	10000	386	11100	107
CGMN-GW-MW4-O-050316 ([illegible] Spk E, 1000 ng/L Lab Spike)	1000	16100	17400	*	1000	2220	3200	98
CGMN-GW-MW4-O-050316 ([illegible] Spk F, 5000 ng/L Lab Spike)	5000	16100	18600	*	5000	2220	7430	104
CGMN-GW-MW4-LS-050316 Low Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	16100	18600	*	1000	2220	3500	128
CGMN-GW-MW4-HS-050316 High Spike 5 ppb ([illegible], 5000 ng/L Field Spike)	5000	16100	31900	*	5000	2220	7460	105
CGMN-GW-MW3-O-050316 ([illegible] Spk G, 500 ng/L Lab Spike)	500	399	1030	126	500	362	868	101
CGMN-GW-MW3-O-050316 ([illegible] Spk H, 5000 ng/L Lab Spike)	5000	399	6770	127	5000	362	5790	109
CGMN-GW-MW3-LS-050316 Low Spike 0.5 ppb ([illegible], 500 ng/L Field Spike)	500	399	1030	126	500	362	890	106
CGMN-GW-MW3-HS-050316 High Spike 5 ppb (C0005467, 5000 ng/L Field Spike)	5000	399	6440	121	5000	362	5090	95
CGMN-GW-MW1-O-050316 ([illegible] Spk I, 100 ng/L Lab Spike)	100	78.4	215	137	100	58.7	160	101
CGMN-GW-MW1-O-050316 ([illegible] Spk J, 1000 ng/L Lab Spike)	1000	78.4	1330	125	1000	58.7	1140	108
CGMN-GW-MW1-LS-050316 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	78.4	216	138	100	58.7	164	106
CGMN-GW-MW1-HS-050316 High Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	78.4	1430	135	1000	58.7	1400	134
CGMN-GW-MW5-O-050316 ([illegible] Spk K, 100 ng/L Lab Spike)	100	NQ	172	172	100	ND	131	131
CGMN-GW-MW5-O-050316 ([illegible] Spk L, 1000 ng/L Lab Spike)	1000	NQ	1330	133	1000	ND	1040	104
CGMN-GW-MW5-LS-050316 Low Spike 0.1 ppb (C0005474, 100 ng/L Field Spike)	100	NQ	151	151	100	ND	148	148
CGMN-GW-MW5-HS-050316 High Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	NQ	1490	149	1000	ND	1230	123
CGMN-GW-MW7-O-050316 ([illegible] Spk M, 100 ng/L Lab Spike)	100	NQ	171	171	100	ND	124	124
CGMN-GW-MW7-O-050316 ([illegible] Spk N, 1000 ng/L Lab Spike)	1000	NQ	1380	138	1000	ND	1070	107
CGMN-GW-MW7-LS-050316 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	NQ	177	177	100	ND	142	142
CGMN-GW-MW7-HS-050316 High Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	NQ	2010	201	1000	ND	1230	123

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 25 ng/L (ppt).

NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-GW-MW2-O-050315 ([illegible] Spk C, 500 ng/L Lab Spike)	500	NQ	623	125	500	NQ	594	119
CGMN-GW-MW2-O-050315 ([illegible] Spk D, 5000 ng/L Lab Spike)	5000	NQ	5630	113	5000	NQ	6000	120
CGMN-GW-MW2-LS-050315 Low Spike 0.5 ppb ([illegible], 500 ng/L Field Spike)	500	NQ	577	115	500	NQ	556	111
CGMN-GW-MW2-HS-050315 High Spike 5 ppb ([illegible], 5000 ng/L Field Spike)	5000	NQ	5040	101	5000	NQ	5640	113
CGMN-GW-MW9-O-050315 ([illegible] Spk E, 500 ng/L Lab Spike)	500	124	684	112	500	353	874	104
CGMN-GW-MW9-O-050315 ([illegible] Spk F, 5000 ng/L Lab Spike)	5000	124	5030	98	5000	353	5380	101
CGMN-GW-MW9-LS-050315 Low Spike 0.5 ppb ([illegible], 500 ng/L Field Spike)	500	124	619	99	500	353	857	101
CGMN-GW-MW9-HS-050315 High Spike 5 ppb ([illegible], 5000 ng/L Field Spike)	5000	124	5760	113	5000	353	5670	110
CGMN-GW-MW12-O-050315 ([illegible] Spk G, 1000 ng/L Lab Spike)	1000	194000	185000	*	1000	49400	50400	*
CGMN-GW-MW12-O-050315 ([illegible] Spk H, 10000 ng/L Lab Spike)	10000	194000	210000	*	10000	49400	58500	*
CGMN-GW-MW12-LS-050315 Low Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	194000	129000	*	1000	49400	36900	*
CGMN-GW-MW12-HS-050315 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	194000	204000	*	10000	49400	59600	*
CGMN-GW-PZ14-O-050315 ([illegible] Spk I, 1000 ng/L Lab Spike)	1000	359	1370	101	1000	496	1620	112
CGMN-GW-PZ14-O-050315 ([illegible] Spk J, 10000 ng/L Lab Spike)	10000	359	13800	134	10000	496	13500	130
CGMN-GW-PZ14-LS-050315 Low Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	359	1280	92	1000	496	1710	121
CGMN-GW-PZ14-HS-050315 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	359	11900	115	10000	496	12500	120
CGMN-GW-MW17-O-050315 ([illegible] Spk K, 500 ng/L Lab Spike)	500	393	992	120	500	488	1030	108
CGMN-GW-MW17-O-050315 ([illegible] Spk L, 5000 ng/L Lab Spike)	5000	393	5490	102	5000	488	5690	102
CGMN-GW-MW17-LS-050315 Low Spike 0.5 ppb ([illegible], 500 ng/L Field Spike)	500	393	1060	133	500	488	970	96
CGMN-GW-MW17-HS-050315 High Spike 5 ppb ([illegible], 5000 ng/L Field Spike)	5000	393	5960	111	5000	488	6080	110
CGMN-GW-MW18-O-050315 ([illegible] Spk M, 500 ng/L Lab Spike)	500	348	830	96	500	902	1550	130
CGMN-GW-MW18-O-050315 ([illegible] Spk N, 5000 ng/L Lab Spike)	5000	348	5160	96	5000	902	5960	102
CGMN-GW-MW18-LS-050315 Low Spike 0.5 ppb ([illegible], 500 ng/L Field Spike)	500	348	917	114	500	902	1590	138
CGMN-GW-MW18-HS-050315 High Spike 5 ppb ([illegible], 5000 ng/L Field Spike)	5000	348	5690	107	5000	902	6900	120

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	C4 Sulfonate PFBS Amt Found In Sample (ng/L)	C4 Sulfonate PFBS Amount Recovered (ng/L)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	C6 Sulfonate PFHS Amt Found In Sample (ng/L)	C6 Sulfonate PFHS Amount Recovered (ng/L)	C6 Sulfonate PFHS Recovery (%)
CGMN-GW-TRIP2-LS-050315 Low Spike 1 ppb (C[illegible], 1000 ng/L Spike)	1000	ND	849	85	1000	ND	1010	101
CGMN-GW-TRIP2-HS-050315 High Spike 10 ppb (C[illegible], 10000 ng/L Spike)	10000	ND	7160	72	10000	ND	9170	92
CGMN-GW-MW11-O-050312 (C[illegible] Spk C, 1000 ng/L Lab Spike)	1000	12800	11600	*	1000	1990	3120	113
CGMN-GW-MW11-O-050312 (C[illegible] Spk D, 10000 ng/L Lab Spike)	10000	12800	21600	88	10000	1990	12300	103
CGMN-GW-MW11-LS-050312 Low Spike 1 ppb (C[illegible], 1000 ng/L Field Spike)	1000	12800	11100	*	1000	1990	3160	117
CGMN-GW-MW11-HS-050312 High Spike 10 ppb (C[illegible], 10000 ng/L Field Spike)	10000	12800	21300	85	10000	1990	13700	117
CGMN-GW-MW101-O-050312 (C[illegible] Spk E, 100000 ng/L Lab Spike)	100000	28400	143000	115	100000	1690000	1660000	*
CGMN-GW-MW101-O-050312 (C[illegible] Spk F, 1000000 ng/L Lab Spike)	1000000	28400	1600000	157	1000000	1690000	3820000	193
CGMN-GW-MW101-LS-050312 Low Spike 100 ppb (C[illegible], 100000 ng/L Field Spike)	100000	28400	144000	116	100000	1690000	1760000	*
CGMN-GW-MW101-HS-050312 High Spike 1000 ppb (C[illegible], 1000000 ng/L Field Spike)	1000000	28400	1130000	110	1000000	1690000	2730000	104
CGMN-GW-MW102-O-050312 (C[illegible] Spk G, 100000 ng/L Lab Spike)	100000	38400	154000	116	100000	92400	218000	126
CGMN-GW-MW102-O-050312 (C[illegible] Spk H, 1000000 ng/L Lab Spike)	1000000	38400	1510000	147	1000000	92400	1590000	150
CGMN-GW-MW102-LS-050312 Low Spike 100 ppb (C[illegible], 100000 ng/L Field Spike)	100000	38400	187000	149	100000	92400	270000	178
CGMN-GW-MW102-HS-050312 High Spike 1000 ppb (C[illegible], 1000000 ng/L Field Spike)	1000000	38400	1350000	131	1000000	92400	1410000	132
CGMN-GW-MW13-O-050312 (C[illegible] Spk I, 1000 ng/L Lab Spike)	1000	1240	2170	93	1000	1570	2620	105
CGMN-GW-MW13-O-050312 (C[illegible] Spk J, 10000 ng/L Lab Spike)	10000	1240	13000	118	10000	1570	13400	118
CGMN-GW-MW13-LS-050312 Low Spike 1 ppb (C[illegible], 1000 ng/L Field Spike)	1000	1240	3310	207	1000	1570	3490	192
CGMN-GW-MW13-HS-050312 High Spike 10 ppb (C[illegible], 10000 ng/L Field Spike)	10000	1240	13700	125	10000	1570	14800	132
CGMN-GW-MW16-O-050312 (C[illegible] Spk K, 1000 ng/L Lab Spike)	1000	14000	12400	*	1000	1990	2830	84
CGMN-GW-MW16-O-050312 (C[illegible] Spk L, 10000 ng/L Lab Spike)	10000	14000	21500	75	10000	1990	12300	103
CGMN-GW-MW16-LS-050312 Low Spike 1 ppb (C[illegible], 1000 ng/L Field Spike)	1000	14000	12800	*	1000	1990	4220	223
CGMN-GW-MW16-HS-050312 High Spike 10 ppb (C[illegible], 10000 ng/L Field Spike)	10000	14000	24000	100	10000	1990	13500	115

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 25 ng/L (ppt).

NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	Amt Found In Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	Amt Found In Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-GW-MW15-O-050312 (C[illegible] Spk C, 1000 ng/L Lab Spike)	1000	1920	3470	155	1000	535	1700	117
CGMN-GW-MW15-O-050312 (C[illegible] Spk D, 10000 ng/L Lab Spike)	10000	1920	18400	165	10000	535	11000	105
CGMN-GW-MW15-LS-050312 Low Spike 1 ppb (C[illegible], 1000 ng/L Field Spike)	1000	1920	3510	159	1000	535	1620	109
CGMN-GW-MW15-HS-050312 High Spike 10 ppb (C[illegible], 10000 ng/L Field Spike)	10000	1920	21500	196	10000	535	12900	124
CGMN-GW-TRIP1-LS-050314 Low Spike 0.5 ppb (C[illegible], 500 ng/L Field Spike)	500	ND	767	153	500	ND	523	105
CGMN-GW-TRIP1-HS-050314 High Spike 5 ppb (C[illegible], 5000 ng/L Field Spike)	5000	ND	8070	161	5000	ND	5060	101
CGMN-GW-PW1-O-050314 (C[illegible] Spk E, 1000 ng/L Lab Spike)	1000	516	2280	176	1000	170	1270	110
CGMN-GW-PW1-O-050314 (C[illegible] Spk F, 10000 ng/L Lab Spike)	10000	515	18800	183	10000	170	11100	109
CGMN-GW-PW1-LS-050314 Low Spike 1 ppb (C[illegible], 1000 ng/L Field Spike)	1000	516	2200	168	1000	170	1250	108
CGMN-GW-PW1-HS-050314 High Spike 10 ppb (C[illegible], 10000 ng/L Field Spike)	10000	516	17700	172	10000	170	10500	103
CGMN-GW-PW2-O-050314 (C[illegible] Spk G, 500 ng/L Lab Spike)	500	255	1140	177	500	167	685	104
CGMN-GW-PW2-O-050314 (C[illegible] Spk H, 5000 ng/L Lab Spike)	5000	255	8590	167	5000	167	5450	106
CGMN-GW-PW2-LS-050314 Low Spike 0.5 ppb (C[illegible], 500 ng/L Field Spike)	500	255	1120	173	500	167	716	110
CGMN-GW-PW2-HS-050314 High Spike 5 ppb (C[illegible], 5000 ng/L Field Spike)	5000	255	8660	168	5000	167	5520	107
CGMN-GW-PW3-O-050314 (C[illegible] Spk I, 100 ng/L Lab Spike)	100	ND	200	200	100	ND	116	116
CGMN-GW-PW3-O-050314 (C[illegible] Spk J, 1000 ng/L Lab Spike)	1000	ND	1740	174	1000	ND	1120	112
CGMN-GW-PW3-LS-050314 Low Spike 0.1 ppb (C[illegible], 100 ng/L Field Spike)	100	ND	202	202	100	ND	131	131
CGMN-GW-PW3-HS-050314 High Spike 1 ppb (C[illegible], 1000 ng/L Field Spike)	1000	ND	1620	162	1000	ND	1120	112
CGMN-GW-PW4-O-050314 (C[illegible] Spk K, 500 ng/L Lab Spike)	500	114	1130	203	500	158	650	98
CGMN-GW-PW4-O-050314 (C[illegible] Spk L, 5000 ng/L Lab Spike)	5000	114	8830	174	5000	158	5290	103
CGMN-GW-PW4-LS-050314 Low Spike 0.5 ppb (C[illegible], 500 ng/L Field Spike)	500	114	1050	187	500	158	656	100
CGMN-GW-PW4-HS-050314 High Spike 5 ppb (C[illegible], 5000 ng/L Field Spike)	5000	114	8900	176	5000	158	5470	106

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 25 ng/L (ppt).

NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	C4 Sulfonate PFBS Amt Found in Sample (ng/L)	C4 Sulfonate PFBS Amount Recovered (ng/L)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	C6 Sulfonate PFHS Amt Found in Sample (ng/L)	C6 Sulfonate PFHS Amount Recovered (ng/L)	C6 Sulfonate PFHS Recovery (%)
CGMN-GW-PW5-O-050314 ([illegible] Spk C, 10000 ng/L Lab Spike)	10000	2240	20900	187	10000	1910	12500	106
CGMN-GW-PW5-O-050314 ([illegible] Spk D, 100000 ng/L Lab Spike)	100000	2240	191000	189	100000	1910	109000	107
CGMN-GW-PW5-LS-050314 Low Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	2240	12800	106	10000	1910	12500	106
CGMN-GW-PW5-HS-050314 High Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	2240	181000	179	100000	1910	116000	113
CGMN-GW-PW6-O-050314 ([illegible] Spk E, 10000 ng/L Lab Spike)	10000	48500	36400	*	10000	4820	16000	112
CGMN-GW-PW6-O-050314 ([illegible] Spk F, 100000 ng/L Lab Spike)	100000	48500	223000	175	100000	4820	115000	110
CGMN-GW-PW6-LS-050314 Low Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	48500	56200	*	10000	4820	14300	95
CGMN-GW-PW6-HS-050314 High Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	48500	218000	168	100000	4820	108000	103
CGMN-GW-PW8-O-050314 ([illegible] Spk G, 100 ng/L Lab Spike)	100	NQ	189	189	100	ND	115	115
CGMN-GW-PW8-O-050314 ([illegible] Spk H, 1000 ng/L Lab Spike)	1000	NQ	1700	170	1000	ND	1120	112
CGMN-GW-PW8-LS-050314 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	NQ	198	198	100	ND	120	120
CGMN-GW-PW8-HS-050314 High Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	NQ	1490	149	1000	ND	1060	106
CGMN-GW-B116-O-050314 ([illegible] Spk I, 10000 ng/L Lab Spike)	10000	ND	16700	167	10000	ND	10500	105
CGMN-GW-B116-O-050314 ([illegible] Spk J, 100000 ng/L Lab Spike)	100000	ND	87300	87	100000	ND	50200	50
CGMN-GW-B116-LS-050314 Low Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	ND	17100	171	10000	ND	10700	107
CGMN-GW-B116-HS-050314 High Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	ND	160000	160	100000	ND	97700	98
CGMN-PW-CWD-O-050314 ([illegible] Spk K, 10000 ng/L Lab Spike)	10000	5750	21900	162	10000	8410	19900	115
CGMN-PW-CWD-O-050314 ([illegible] Spk L, 100000 ng/L Lab Spike)	100000	5750	86700	81	100000	8410	60600	52
CGMN-PW-CWD-LS-050314 Low Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	5750	22200	165	10000	8410	20200	118
CGMN-PW-CWD-HS-050314 High Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	5750	183000	177	100000	8410	117000	109
CGMN-GW-CWD-O-050405 ([illegible] Spk C, 1000 ng/L Lab Spike)	1000	7290	9420	*	1000	9910	11400	*
CGMN-GW-CWD-O-050405 ([illegible] Spk D, 10000 ng/L Lab Spike)	10000	7290	26000	187	10000	9910	20900	110
CGMN-GW-CWD-LS-050405 ([illegible], 1000 ng/L Field Spike)	1000	7290	9670	*	1000	9910	10800	*
CGMN-GW-CWD-HS-050405 ([illegible], 10000 ng/L Field Spike)	10000	7290	23700	164	10000	9910	18600	89

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 25 ng/L (ppt).

NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Water Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
WBMN-GW-CWM-O-050405 (C0067880 Spk E, 1000 ng/L Lab Spike)	1000	7350	9260	*	1000	11600	12800	*
WBMN-GW-CWM-O-050405 (C0067880 Spk F, 10000 ng/L Lab Spike)	10000	7350	25000	177	10000	11600	21000	94
WBMN-GW-CWM-LS-050405 (C0067882, 1000 ng/L Field Spike)	1000	7350	8710	*	1000	11600	12700	*
WBMN-GW-CWM-HS-050405 (C0067883, 10000 ng/L Field Spike)	10000	7350	21100	136	10000	11600	20000	84
WBMN-GW-R-2-O-050405 (C0067884 Spk G, 1000 ng/L Lab Spike)	1000	ND	2040	204	1000	ND	1090	109
WBMN-GW-R-2-O-050405 (C0067884 Spk H, 10000 ng/L Lab Spike)	10000	ND	19000	190	10000	ND	11100	111
WBMN-GW-R-2-LS-050405 (C0067886, 1000 ng/L Field Spike)	1000	ND	1870	187	1000	ND	1110	111
WBMN-GW-R-2-HS-050405 (C0067887, 10000 ng/L Field Spike)	10000	ND	17700	177	10000	ND	10500	105
WBMN-GW-R-3-O-050405 (C0067868 Spk C, 1000 ng/L Lab Spike)	1000	360	1280	92	1000	1290	2210	92
WBMN-GW-R-3-O-050405 (C0067868 Spk D, 10000 ng/L Lab Spike)	10000	360	9710	94	10000	1290	11500	102
WBMN-GW-R-3-LS-050405 (C0067870, 1000 ng/L Field Spike)	1000	360	1130	77	1000	1290	2210	92
WBMN-GW-R-3-HS-050405 (C0067871, 10000 ng/L Field Spike)	10000	360	9510	92	10000	1290	11500	102
WBMN-GW-R-1-O-050405 (C0067872 Spk E, 1000 ng/L Lab Spike)	1000	1660	3100	122	1000	2310	3740	143
WBMN-GW-R-1-O-050405 (C0067872 Spk F, 10000 ng/L Lab Spike)	10000	1660	11400	96	10000	2310	13300	110
WBMN-GW-R-1-LS-050405 (C0067873, 1000 ng/L Field Spike)	1000	1660	2710	83	1000	2310	3430	112
WBMN-GW-R-1-HS-050405 (C0067874, 10000 ng/L Field Spike)	10000	1660	10600	89	10000	2310	13000	107
WBMN-GW-R-4-O-050405 (C0067876 Spk G, 1000 ng/L Lab Spike)	1000	6050	6760	*	1000	20100	21200	*
WBMN-GW-R-4-O-050405 (C0067876 Spk H, 10000 ng/L Lab Spike)	10000	6050	16500	105	10000	20100	30400	103
WBMN-GW-R-4-LS-050405 (C0067878, 1000 ng/L Field Spike)	1000	6050	7220	*	1000	20100	20800	*
WBMN-GW-R-4-HS-050405 (C0067879, 10000 ng/L Field Spike)	10000	6050	14600	86	10000	20100	28700	86
WBMN-GW-Field-Blank-LS-050405 (C0067880, 1000 ng/L Field Spike)	1000	ND	762	76	1000	ND	1050	105
WBMN-GW-Field-Blank-HS-050405 (C0067881, 10000 ng/L Field Spike)	10000	ND	6330	63	10000	ND	10200	102
			Average:	137			Average:	113
			Standard Deviation:	37			Standard Deviation:	29

*Sample residue exceeds the spiking level significantly, therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/L)	C8 Sulfonate PFOS Amt Found in Sample (ng/L)	C8 Sulfonate PFOS Amount Recovered (ng/L)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/L)	C8 Acid PFOA Amt Found in Sample (ng/L)	C8 Acid PFOA Amount Recovered (ng/L)	C8 Acid PFOA Recovery (%)
WBMN-GW-R1-DP-050314 (C0005433 Spk C, 1000 ng/L Lab Spike)	1000	55.8	1050	99	1000	2200	3380	118
WBMN-GW-R1-O-050314 (C0005432 Spk D, 10000 ng/L Lab Spike)	10000	55.8	10100	100	10000	2200	12200	100
WBMN-GW-R1-LS-050314 Low Spike 1 ppb (C0005434, 1000 ng/L Field Spike)	1000	55.8	1010	95	1000	2200	3200	100
WBMN-GW-R1-HS-050314 High Spike 10 ppb (C0005435, 10000 ng/L Field Spike)	10000	55.8	12800	125	10000	2200	13900	117
WBMN-GW-R2-O-050314 (C0005436 Spk E, 1000 ng/L Lab Spike)	1000	ND	1020	102	1000	ND	1060	106
WBMN-GW-R2-O-050314 (C0005436 Spk F, 10000 ng/L Lab Spike)	10000	ND	9620	96	10000	ND	10500	105
WBMN-GW-R2-LS-050314 Low Spike 1 ppb (C0005438, 1000 ng/L Field Spike)	1000	ND	1260	126	1000	ND	1150	115
WBMN-GW-R2-HS-050314 High Spike 10 ppb (C0005439, 10000 ng/L Field Spike)	10000	ND	12400	124	10000	ND	12100	121
WBMN-GW-R3-O-050314 (C0005440 Spk G, 1000 ng/L Lab Spike)	1000	116	1150	103	1000	159	1240	108
WBMN-GW-R3-O-050314 (C0005440 Spk H, 10000 ng/L Lab Spike)	10000	116	9680	98	10000	159	10500	103
WBMN-GW-R3-LS-050314 Low Spike 1 ppb (C0005442, 1000 ng/L Field Spike)	1000	116	1210	109	1000	159	1190	103
WBMN-GW-R3-HS-050314 High Spike 10 ppb (C0005443, 10000 ng/L Field Spike)	10000	116	12900	128	10000	159	11800	116
WBMN-GW-R4-O-050314 (C0005444 Spk I, 1000 ng/L Lab Spike)	1000	2480	3610	113	1000	2860	3850	109
WBMN-GW-R4-O-050314 (C0005444 Spk J, 10000 ng/L Lab Spike)	10000	2480	12100	96	10000	2860	13800	107
WBMN-GW-R4-LS-050314 Low Spike 1 ppb (C0005446, 1000 ng/L Field Spike)	1000	2480	3870	139	1000	2860	4010	115
WBMN-GW-R4-HS-050314 High Spike 10 ppb (C0005447, 10000 ng/L Field Spike)	10000	2480	16200	137	10000	2860	15800	129
WBMN-GW-CWM-O-050314 (C0005448 Spk K, 1000 ng/L Lab Spike)	1000	1150	1980	83	1000	1870	2970	110
WBMN-GW-CWM-O-050314 (C0005448 Spk L, 10000 ng/L Lab Spike)	10000	1150	10800	96	10000	1870	12800	109
WBMN-GW-CWM-LS-050314 Low Spike 1 ppb (C0005450, 1000 ng/L Field Spike)	1000	1150	2100	95	1000	1870	3080	121
WBMN-GW-CWM-HS-050314 High Spike 10 ppb (C0005451, 10000 ng/L Field Spike)	10000	1150	10700	96	10000	1870	13100	112
CGMN-GW-MW14-O-050318 (C0005452 Spk M, 100000 ng/L Lab Spike)	100000	74800	189000	114	100000	967000	1210000	*
CGMN-GW-MW14-O-050318 (C0005452 Spk N, 1000000 ng/L Lab Spike)	1000000	74800	1120000	105	1000000	967000	2080000	111
CGMN-GW-MW14-LS-050318 Low Spike 100 ppb (C0005454, 100000 ng/L Field Spike)	100000	74800	201000	126	100000	967000	1260000	*
CGMN-GW-MW14-HS-050318 High Spike 1000 ppb (C0005455, 1000000 ng/L Field Spike)	1000000	74800	1340000	127	1000000	967000	2410000	144

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples Continued

	C8 Sulfonate PFOS				C8 Acid PFOA			
Sample Description	Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-GW-MW10-O-050316 (C0005456 Spk C, 1000 ng/L Lab Spike)	1000	2240	2960	72	1000	2220	3080	86
CGMN-GW-MW10-O-050316 (C0005456 Spk D, 10000 ng/L Lab Spike)	10000	2240	11800	94	10000	2220	11400	92
CGMN-GW-MW10-LS-050316 Low Spike 1 ppb (C0005458, 1000 ng/L Field Spike)	1000	2240	2710	47	1000	2220	3020	80
CGMN-GW-MW10-HS-050316 High Spike 10 ppb (C0005459, 10000 ng/L Field Spike)	10000	2240	12600	104	10000	2220	12500	103
CGMN-GW-MW4-O-050316 (C0005460 Spk E, 1000 ng/L Lab Spike)	1000	179	1120	94	1000	10700	10800	*
CGMN-GW-MW4-O-050316 (C0005460 Spk F, 5000 ng/L Lab Spike)	5000	179	5030	97	5000	10700	14800	82
CGMN-GW-MW4-LS-050316 Low Spike 1 ppb (C0005462, 1000 ng/L Field Spike)	1000	179	1510	133	1000	10700	13200	*
CGMN-GW-MW4-HS-050316 High Spike 5 ppb (C0005463, 5000 ng/L Field Spike)	5000	179	5910	115	5000	10700	15900	104
CGMN-GW-MW3-O-050316 (C0005464 Spk G, 500 ng/L Lab Spike)	500	164	671	97	500	8140	8640	*
CGMN-GW-MW3-O-050316 (C0005464 Spk H, 5000 ng/L Lab Spike)	5000	164	5080	98	5000	8140	14000	117
CGMN-GW-MW3-LS-050316 Low Spike 0.5 ppb (C0005466, 500 ng/L Field Spike)	500	164	697	103	500	8140	8720	*
CGMN-GW-MW3-HS-050316 High Spike 5 ppb (C0005467, 5000 ng/L Field Spike)	5000	164	5010	97	5000	8140	12700	91
CGMN-GW-MW1-O-050316 (C0005468 Spk I, 100 ng/L Lab Spike)	100	667	767	*	100	1130	1200	*
CGMN-GW-MW1-O-050316 (C0005468 Spk J, 1000 ng/L Lab Spike)	1000	667	1720	105	1000	1130	2160	103
CGMN-GW-MW1-LS-050316 Low Spike 0.1 ppb (C0005470, 100 ng/L Field Spike)	100	667	819	*	100	1130	1200	*
CGMN-GW-MW1-HS-050316 High Spike 1 ppb (C0005471, 1000 ng/L Field Spike)	1000	667	2040	137	1000	1130	2680	156
CGMN-GW-MW5-O-050316 (C0005472 Spk K, 100 ng/L Lab Spike)	100	142	265	123	100	746	842	*
CGMN-GW-MW5-O-050316 (C0005472 Spk L, 1000 ng/L Lab Spike)	1000	142	1080	94	1000	746	1610	86
CGMN-GW-MW5-LS-050316 Low Spike 0.1 ppb (C0005474, 100 ng/L Field Spike)	100	142	194	52	100	746	1140	*
CGMN-GW-MW5-HS-050316 High Spike 1 ppb (C0005475, 1000 ng/L Field Spike)	1000	142	1460	132	1000	746	1940	119
CGMN-GW-MW7-O-050316 (C0005476 Spk M, 100 ng/L Lab Spike)	100	101	208	107	100	237	341	104
CGMN-GW-MW7-O-050316 (C0005476 Spk N, 1000 ng/L Lab Spike)	1000	101	1060	96	1000	237	1270	103
CGMN-GW-MW7-LS-050316 Low Spike 0.1 ppb (C0005478, 100 ng/L Field Spike)	100	101	222	121	100	237	372	135
CGMN-GW-MW7-HS-050316 High Spike 1 ppb (C0005479, 1000 ng/L Field Spike)	1000	101	1250	115	1000	237	1440	120

*Sample residue exceeds the spiking level significantly, therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-GW-MW2-O-050315 ([illegible] Spk C, 500 ng/L Lab Spike)	500	ND	550	110	500	1500	2200	140
CGMN-GW-MW2-O-050315 ([illegible] Spk D, 5000 ng/L Lab Spike)	5000	ND	5730	115	5000	1500	7750	125
CGMN-GW-MW2-LS-050315 Low Spike 0.5 ppb ([illegible], 500 ng/L Field Spike)	500	ND	538	108	500	1500	2210	142
CGMN-GW-MW2-HS-050315 High Spike 5 ppb ([illegible], 5000 ng/L Field Spike)	5000	ND	6750	135	5000	1500	7910	128
CGMN-GW-MW9-O-050315 ([illegible] Spk E, 500 ng/L Lab Spike)	500	237	790	111	500	935	1400	93
CGMN-GW-MW9-O-050315 ([illegible] Spk F, 5000 ng/L Lab Spike)	5000	237	5220	100	5000	935	6620	114
CGMN-GW-MW9-LS-050315 Low Spike 0.5 ppb ([illegible], 500 ng/L Field Spike)	500	237	806	114	500	935	1270	67
CGMN-GW-MW9-HS-050315 High Spike 5 ppb ([illegible], 5000 ng/L Field Spike)	5000	237	5810	111	5000	935	6850	118
CGMN-GW-MW12-O-050315 ([illegible] Spk G, 1000 ng/L Lab Spike)	1000	219000	212000	*	1000	2140000	2110000	*
CGMN-GW-MW12-O-050315 ([illegible] Spk H, 10000 ng/L Lab Spike)	10000	219000	248000	*	10000	2140000	2360000	*
CGMN-GW-MW12-LS-050315 Low Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	219000	176000	*	1000	2140000	1330000	*
CGMN-GW-MW12-HS-050315 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	219000	231000	*	10000	2140000	2310000	*
CGMN-GW-PZ14-O-050315 ([illegible] Spk I, 1000 ng/L Lab Spike)	1000	543	1720	118	1000	2710	4140	143
CGMN-GW-PZ14-O-050315 ([illegible] Spk J, 10000 ng/L Lab Spike)	10000	543	13600	130	10000	2710	22300	196
CGMN-GW-PZ14-LS-050315 Low Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	543	2000	146	1000	2710	3900	119
CGMN-GW-PZ14-HS-050315 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	543	12800	123	10000	2710	18100	154
CGMN-GW-MW17-O-050315 ([illegible] Spk K, 500 ng/L Lab Spike)	500	596	1090	99	500	1760	2370	122
CGMN-GW-MW17-O-050315 ([illegible] Spk L, 5000 ng/L Lab Spike)	5000	595	5890	106	5000	1760	7660	118
CGMN-GW-MW17-LS-050315 Low Spike 0.5 ppb ([illegible], 500 ng/L Field Spike)	500	595	929	67	500	1760	2240	96
CGMN-GW-MW17-HS-050315 High Spike 5 ppb ([illegible], 5000 ng/L Field Spike)	5000	595	6040	109	5000	1760	7790	121
CGMN-GW-MW18-O-050315 ([illegible] Spk M, 500 ng/L Lab Spike)	500	777	1300	105	500	2140	2660	*
CGMN-GW-MW18-O-050315 ([illegible] Spk N, 5000 ng/L Lab Spike)	5000	777	5850	97	5000	2140	7410	105
CGMN-GW-MW18-LS-050315 Low Spike 0.5 ppb ([illegible], 500 ng/L Field Spike)	500	777	1450	135	500	2140	3050	*
CGMN-GW-MW18-HS-050315 High Spike 5 ppb ([illegible], 5000 ng/L Field Spike)	5000	777	8070	146	5000	2140	9020	138

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-GW-TRIP2-LS-050315 Low Spike 1 ppb ([illegible], 1000 ng/L Spike)	1000	ND	1220	122	1000	ND	1270	127
CGMN-GW-TRIP2-HS-050315 High Spike 10 ppb ([illegible], 10000 ng/L Spike)	10000	ND	10100	101	10000	ND	11100	111
CGMN-GW-MW11-O-050312 ([illegible] Spk C, 1000 ng/L Lab Spike)	1000	10900	13700	*	1000	69500	64100	*
CGMN-GW-MW11-O-050312 ([illegible] Spk D, 10000 ng/L Lab Spike)	10000	10900	21400	105	10000	69500	76300	*
CGMN-GW-MW11-LS-050312 Low Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	10900	12100	*	1000	69500	53800	*
CGMN-GW-MW11-HS-050312 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	10900	21900	110	10000	69500	76700	*
CGMN-GW-MW101-O-050312 ([illegible] Spk E, 100000 ng/L Lab Spike)	100000	341000	528000	*	100000	157000	310000	153
CGMN-GW-MW101-O-050312 ([illegible] Spk F, 1000000 ng/L Lab Spike)	1000000	341000	2180000	184	1000000	157000	2120000	196
CGMN-GW-MW101-LS-050312 Low Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	341000	482000	*	100000	157000	288000	131
CGMN-GW-MW101-HS-050312 High Spike 1000 ppb ([illegible], 1000000 ng/L Field Spike)	1000000	341000	2090000	175	1000000	157000	1390000	123
CGMN-GW-MW102-O-050312 ([illegible] Spk G, 100000 ng/L Lab Spike)	100000	45900	181000	135	100000	175000	308000	133
CGMN-GW-MW102-O-050312 ([illegible] Spk H, 1000000 ng/L Lab Spike)	1000000	45900	1660000	161	1000000	175000	1830000	166
CGMN-GW-MW102-LS-050312 Low Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	45900	216000	170	100000	175000	349000	174
CGMN-GW-MW102-HS-050312 High Spike 1000 ppb ([illegible], 1000000 ng/L Field Spike)	1000000	45900	1380000	133	1000000	175000	1370000	120
CGMN-GW-MW13-O-050312 ([illegible] Spk I, 1000 ng/L Lab Spike)	1000	13400	14300	*	1000	15500	15800	*
CGMN-GW-MW13-O-050312 ([illegible] Spk J, 10000 ng/L Lab Spike)	10000	13400	26000	126	10000	15500	31700	162
CGMN-GW-MW13-LS-050312 Low Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	13400	23700	*	1000	15500	26900	*
CGMN-GW-MW13-HS-050312 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	13400	46300	329	10000	15500	47800	323
CGMN-GW-MW16-O-050312 ([illegible] Spk K, 1000 ng/L Lab Spike)	1000	41100	30600	*	1000	24000	19800	*
CGMN-GW-MW16-O-050312 ([illegible] Spk L, 10000 ng/L Lab Spike)	10000	41100	36900	*	10000	24000	34200	102
CGMN-GW-MW16-LS-050312 Low Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	41100	39600	*	1000	24000	23100	*
CGMN-GW-MW16-HS-050312 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	41100	50900	*	10000	24000	39400	154

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples Continued

Sample Description	C8 Sulfonate PFOS				C8 Acid PFOA			
	Amount Spiked (ng/L)	Amt Found In Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	Amount Spiked (ng/L)	Amt Found In Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-GW-MW15-O-050312 (C000[illegible] Spk C, 1000 ng/L Lab Spike)	1000	11300	10400	*	1000	6390	7100	*
CGMN-GW-MW15-O-050312 (C000[illegible] Spk D, 10000 ng/L Lab Spike)	10000	11300	25100	148	10000	6390	16600	102
CGMN-GW-MW15-LS-050312 Low Spike 1 ppb (C000[illegible], 1000 ng/L Field Spike)	1000	11300	13000	*	1000	6390	7040	*
CGMN-GW-MW15-HS-050312 High Spike 10 ppb (C000[illegible], 10000 ng/L Field Spike)	10000	11300	30200	189	10000	6390	19400	130
CGMN-GW-TRIP1-LS-050314 Low Spike 0.5 ppb (C000[illegible], 500 ng/L Field Spike)	500	ND	558	112	500	ND	495	99
CGMN-GW-TRIP1-HS-050314 High Spike 5 ppb (C000[illegible], 5000 ng/L Field Spike)	5000	ND	5900	118	5000	ND	5250	105
CGMN-GW-PW1-O-050314 (C000[illegible] Spk E, 1000 ng/L Lab Spike)	1000	457	1410	95	1000	3320	4550	*
CGMN-GW-PW1-O-050314 (C000[illegible] Spk F, 10000 ng/L Lab Spike)	10000	457	8520	81	10000	3320	14300	110
CGMN-GW-PW1-LS-050314 Low Spike 1 ppb (C000[illegible], 1000 ng/L Field Spike)	1000	457	1760	130	1000	3320	5230	*
CGMN-GW-PW1-HS-050314 High Spike 10 ppb (C000[illegible], 10000 ng/L Field Spike)	10000	457	9790	93	10000	3320	14600	112
CGMN-GW-PW2-O-050314 (C000[illegible] Spk G, 500 ng/L Lab Spike)	500	573	712	28	500	3860	4280	*
CGMN-GW-PW2-O-050314 (C000[illegible] Spk H, 5000 ng/L Lab Spike)	5000	573	5620	101	5000	3880	9610	115
CGMN-GW-PW2-LS-050314 Low Spike 0.5 ppb (C000[illegible], 500 ng/L Field Spike)	500	573	1090	103	500	3860	6030	*
CGMN-GW-PW2-HS-050314 High Spike 5 ppb (C000[illegible], 5000 ng/L Field Spike)	5000	573	6800	125	5000	3860	9610	115
CGMN-GW-PW3-O-050314 (C000[illegible] Spk I, 100 ng/L Lab Spike)	100	ND	44.9	45	100	523	641	*
CGMN-GW-PW3-O-050314 (C000[illegible] Spk J, 1000 ng/L Lab Spike)	1000	ND	498	50	1000	523	1530	101
CGMN-GW-PW3-LS-050314 Low Spike 0.1 ppb (C000[illegible], 100 ng/L Field Spike)	100	ND	70.3	70	100	523	752	*
CGMN-GW-PW3-HS-050314 High Spike 1 ppb (C000[illegible], 1000 ng/L Field Spike)	1000	ND	574	57	1000	523	1610	109
CGMN-GW-PW4-O-050314 (C000[illegible] Spk K, 500 ng/L Lab Spike)	500	ND	475	95	500	1190	1630	88
CGMN-GW-PW4-O-050314 (C000[illegible] Spk L, 5000 ng/L Lab Spike)	5000	ND	4680	94	5000	1190	6040	97
CGMN-GW-PW4-LS-050314 Low Spike 0.5 ppb (C000[illegible], 500 ng/L Field Spike)	500	ND	502	100	500	1190	1910	144
CGMN-GW-PW4-HS-050314 High Spike 5 ppb (C000[illegible], 5000 ng/L Field Spike)	5000	ND	5690	114	5000	1190	6490	106

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/L)	PFOS Amt Found in Sample (ng/L)	PFOS Amount Recovered (ng/L)	PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/L)	PFOA Amt Found in Sample (ng/L)	PFOA Amount Recovered (ng/L)	PFOA Recovery (%)
CGMN-GW-PW5-O-050314 ([illegible] Spk C, 10000 ng/L Lab Spike)	10000	4340	14300	100	10000	14800	23000	82
CGMN-GW-PW5-O-050314 ([illegible] Spk D, 100000 ng/L Lab Spike)	100000	4340	137000	133	100000	14800	118000	103
CGMN-GW-PW5-LS-050314 Low Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	4340	17100	128	10000	14800	24200	94
CGMN-GW-PW5-HS-050314 High Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	4340	131000	127	100000	14800	114000	99
CGMN-GW-PW6-O-050314 ([illegible] Spk E, 10000 ng/L Lab Spike)	10000	33300	42000	*	10000	158000	189000	*
CGMN-GW-PW6-O-050314 ([illegible] Spk F, 100000 ng/L Lab Spike)	100000	33300	154000	121	100000	158000	277000	119
CGMN-GW-PW6-LS-050314 Low Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	33300	37400	*	10000	158000	168000	*
CGMN-GW-PW6-HS-050314 High Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	33300	150000	117	100000	158000	268000	108
CGMN-GW-PW8-O-050314 ([illegible] Spk G, 100 ng/L Lab Spike)	100	ND	108	106	100	570	656	*
CGMN-GW-PW8-O-050314 ([illegible] Spk H, 1000 ng/L Lab Spike)	1000	ND	1180	118	1000	570	1690	112
CGMN-GW-PW8-LS-050314 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	ND	120	120	100	570	714	*
CGMN-GW-PW8-HS-050314 High Spike 1 ppb ([illegible], 1000 ng/L Field Spike)	1000	ND	1110	111	1000	570	1630	106
CGMN-GW-B116-O-050314 ([illegible] Spk I, 10000 ng/L Lab Spike)	10000	ND	10400	104	10000	ND	10300	103
CGMN-GW-B116-O-050314 ([illegible] Spk J, 100000 ng/L Lab Spike)	100000	ND	59700	60	100000	ND	51400	51
CGMN-GW-B116-LS-050314 Low Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	ND	11700	117	10000	ND	11400	114
CGMN-GW-B116-HS-050314 High Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	ND	109000	109	100000	ND	92100	92
CGMN-PW-CWD-O-050314 ([illegible] Spk K, 10000 ng/L Lab Spike)	10000	1150	10400	93	10000	3030	13400	104
CGMN-PW-CWD-O-050314 ([illegible] Spk L, 100000 ng/L Lab Spike)	100000	1150	66400	65	100000	3030	58100	55
CGMN-PW-CWD-LS-050314 Low Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	1150	13200	121	10000	3030	14800	116
CGMN-PW-CWD-HS-050314 High Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	1150	90200	89	100000	3030	93500	90
CGMN-GW-CWD-O-050405 ([illegible] Spk C, 1000 ng/L Lab Spike)	1000	1430	2500	107	1000	2720	3840	112
CGMN-GW-CWD-O-050405 ([illegible] Spk D, 10000 ng/L Lab Spike)	10000	1430	11600	104	10000	2720	13200	105
CGMN-GW-CWD-LS-050405 ([illegible], 1000 ng/L Field Spike)	1000	1430	2330	90	1000	2720	3690	97
CGMN-GW-CWD-HS-050405 ([illegible], 10000 ng/L Field Spike)	10000	1430	9320	79	10000	2720	10600	79

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 25 ng/L (ppt).

NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Water Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
WBMN-GW-CWM-O-050405 (C00678[illegible] Spk E, 1000 ng/L Lab Spike)	1000	1260	2400	114	1000	2230	3360	113
WBMN-GW-CWM-O-050405 (C00678[illegible] Spk F, 10000 ng/L Lab Spike)	10000	1260	11200	99	10000	2230	12400	102
WBMN-GW-CWM-LS-050405 (C00678[illegible], 1000 ng/L Field Spike)	1000	1260	2100	84	1000	2230	3100	87
WBMN-GW-CWM-HS-050405 (C00678[illegible], 10000 ng/L Field Spike)	10000	1260	10900	96	10000	2230	10600	84
WBMN-GW-R-2-O-050405 (C00678[illegible] Spk G, 1000 ng/L Lab Spike)	1000	ND	1030	103	1000	ND	1060	106
WBMN-GW-R-2-O-050405 (C00678[illegible] Spk H, 10000 ng/L Lab Spike)	10000	ND	11300	113	10000	ND	10600	106
WBMN-GW-R-2-LS-050405 (C00678[illegible], 1000 ng/L Field Spike)	1000	ND	1270	127	1000	ND	1150	115
WBMN-GW-R-2-HS-050405 (C00678[illegible], 10000 ng/L Field Spike)	10000	ND	12100	121	10000	ND	10900	109
WBMN-GW-R-3-O-050405 (C00678[illegible] Spk C, 1000 ng/L Lab Spike)	1000	143	1140	100	1000	191	1280	109
WBMN-GW-R-3-O-050405 (C00678[illegible] Spk D, 10000 ng/L Lab Spike)	10000	143	10800	107	10000	191	11700	115
WBMN-GW-R-3-LS-050405 (C00678[illegible], 1000 ng/L Field Spike)	1000	143	1090	95	1000	191	1200	101
WBMN-GW-R-3-HS-050405 (C00678[illegible], 10000 ng/L Field Spike)	10000	143	9760	96	10000	191	11100	109
WBMN-GW-R-1-O-050405 (C00678[illegible] Spk E, 1000 ng/L Lab Spike)	1000	NQ	1160	116	1000	2060	4000	194
WBMN-GW-R-1-O-050405 (C00678[illegible] Spk F, 10000 ng/L Lab Spike)	10000	NQ	11100	111	10000	2060	14200	121
WBMN-GW-R-1-LS-050405 (C00678[illegible], 1000 ng/L Field Spike)	1000	NQ	1200	120	1000	2060	3650	150
WBMN-GW-R-1-HS-050405 (C00678[illegible], 10000 ng/L Field Spike)	10000	NQ	12200	122	10000	2060	14700	126
WBMN-GW-R-4-O-050405 (C00678[illegible] Spk G, 1000 ng/L Lab Spike)	1000	2340	3420	108	1000	3120	4170	*
WBMN-GW-R-4-O-050405 (C00678[illegible] Spk H, 10000 ng/L Lab Spike)	10000	2340	13000	107	10000	3120	14000	109
WBMN-GW-R-4-LS-050405 (C00678[illegible], 1000 ng/L Field Spike)	1000	2340	3110	77	1000	3120	3900	*
WBMN-GW-R-4-HS-050405 (C00678[illegible], 10000 ng/L Field Spike)	10000	2340	11600	93	10000	3120	11900	88
WBMN-GW-Field-Blank-LS-050405 (C00678[illegible], 1000 ng/L Field Spike)	1000	ND	1110	111	1000	ND	1210	121
WBMN-GW-Field-Blank-HS-050405 (C00678[illegible], 10000 ng/L Field Spike)	10000	ND	10600	106	10000	ND	11700	117
			Average:	118			Average:	115
			Standard Deviation:	31			Standard Deviation:	30

*Sample residue exceeds the spiking level significantly; therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 25 ng/L (ppt).

NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Water Samples

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery (%)
C0065433 Spk C	WBMN-GW-R1-DP-050314	1500	1290	86
C0065432 Spk D	WBMN-GW-R1-O-050314	10500	10700	102
C0065432	WBMN-GW-R1-O-050314	500	376	75
C0065432 Rep	WBMN-GW-R1-O-050314	500	383	77
C0065433	WBMN-GW-R1-DP-050314	500	395	79
C0065434	WBMN-GW-R1-LS-050314 Low Spike 1 ppb	1000	989	99
C0065435	WBMN-GW-R1-HS-050314 High Spike 10 ppb	10000	11300	113
C0065436 Spk E	WBMN-GW-R2-O-050314	1500	1540	103
C0065436 Spk F	WBMN-GW-R2-O-050314	10500	11100	106
C0065436	WBMN-GW-R2-O-050314	500	463	93
C0065436 Rep	WBMN-GW-R2-O-050314	500	426	85
C0065437	WBMN-GW-R2-DP-050314	500	450	90
C0065438	WBMN-GW-R2-LS-050314 Low Spike 1 ppb	1000	1130	113
C0065439	WBMN-GW-R2-HS-050314 High Spike 10 ppb	10000	12000	120
C0065440 Spk G	WBMN-GW-R3-O-050314	1500	1590	106
C0065440 Spk H	WBMN-GW-R3-O-050314	10500	10900	104
C0065440	WBMN-GW-R3-O-050314	500	422	84
C0065440 Rep	WBMN-GW-R3-O-050314	500	403	81
C0065441	WBMN-GW-R3-DP-050314	500	420	84
C0065442	WBMN-GW-R3-LS-050314 Low Spike 1 ppb	1000	1010	101
C0065443	WBMN-GW-R3-HS-050314 High Spike 10 ppb	10000	11500	115
C0065444 Spk I	WBMN-GW-R4-O-050314	1500	1530	102
C0065444 Spk J	WBMN-GW-R4-O-050314	10500	11300	108
C0065444	WBMN-GW-R4-O-050314	500	435	87
C0065444 Rep	WBMN-GW-R4-O-050314	500	417	83
C0065445	WBMN-GW-R4-DP-050314	500	434	87
C0065446	WBMN-GW-R4-LS-050314 Low Spike 1 ppb	1000	1060	106
C0065447	WBMN-GW-R4-HS-050314 High Spike 10 ppb	10000	12100	121
C0065448 Spk K	WBMN-GW-CWM-O-050314	1500	1520	101
C0065448 Spk L	WBMN-GW-CWM-O-050314	10500	10900	104
C0065448	WBMN-GW-CWM-O-050314	500	450	90
C0065448 Rep	WBMN-GW-CWM-O-050314	500	445	89
C0065449	WBMN-GW-CWM-DP-050314	500	419	84
C0065450	WBMN-GW-CWM-LS-050314 Low Spike 1 ppb	1000	989	99
C0065451	WBMN-GW-CWM-HS-050314 High Spike 10 ppb	10000	10300	103
C0065452 Spk M	CGMN-GW-MW14-O-050316	100500	107000	106
C0065452 Spk N	CGMN-GW-MW14-O-050316	1000500	979000	98
C0065452	CGMN-GW-MW14-O-050316	500	284	57
C0065452 Rep	CGMN-GW-MW14-O-050316	500	282	56
C0065453	CGMN-GW-MW14-DP-050316	500	296	59
C0065454	CGMN-GW-MW14-LS-050316 Low Spike 100 ppb	100000	107000	107
C0065455	CGMN-GW-MW14-HS-050316 High Spike 1000 ppb	1000000	962000	96

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Water Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery (%)
C0065456 Spk C	CGMN-GW-MW10-O-050316	1500	1590	106
C0065456 Spk D	CGMN-GW-MW10-O-050316	10500	10800	103
C0065456	CGMN-GW-MW10-O-050316	500	444	89
C0065456 Rep	CGMN-GW-MW10-O-050316	500	429	86
C0065457	CGMN-GW-MW10-DP-050316	500	467	93
C0065458	CGMN-GW-MW10-LS-050316 Low Spike 1 ppb	1000	997	100
C0065459	CGMN-GW-MW10-HS-050316 High Spike 10 ppb	10000	10400	104
C0065460 Spk E	CGMN-GW-MW4-O-050316	1500	1550	103
C0065460 Spk F	CGMN-GW-MW4-O-050316	5500	5990	109
C0065460	CGMN-GW-MW4-O-050316	500	441	88
C0065460 Rep	CGMN-GW-MW4-O-050316	500	423	85
C0065461	CGMN-GW-MW4-DP-050316	500	397	79
C0065462	CGMN-GW-MW4-LS-050316 Low Spike 1 ppb	1000	1190	119
C0065463	CGMN-GW-MW4-HS-050316 High Spike 5 ppb	5000	4920	98
C0065464 Spk G	CGMN-GW-MW3-O-050316	1000	846	85
C0065464 Spk H	CGMN-GW-MW3-O-050316	5500	5620	102
C0065464	CGMN-GW-MW3-O-050316	500	417	83
C0065464 Rep	CGMN-GW-MW3-O-050316	500	417	83
C0065465	CGMN-GW-MW3-DP-050316	500	438	88
C0065466	CGMN-GW-MW3-LS-050316 Low Spike 0.5 ppb	500	395	79
C0065467	CGMN-GW-MW3-HS-050316 High Spike 5 ppb	5000	3870	77
C0065468 Spk I	CGMN-GW-MW1-O-050316	600	593	99
C0065468 Spk J	CGMN-GW-MW1-O-050316	1500	1560	104
C0065468	CGMN-GW-MW1-O-050316	500	492	98
C0065468 Rep	CGMN-GW-MW1-O-050316	500	493	99
C0065469	CGMN-GW-MW1-DP-050316	500	533	107
C0065470	CGMN-GW-MW1-LS-050316 Low Spike 0.1 ppb	100	96.4	96
C0065471	CGMN-GW-MW1-HS-050316 High Spike 1 ppb	1000	1300	130
C0065472 Spk K	CGMN-GW-MW5-O-050316	600	594	99
C0065472 Spk L	CGMN-GW-MW5-O-050316	1500	1450	97
C0065472	CGMN-GW-MW5-O-050316	500	471	94
C0065472 Rep	CGMN-GW-MW5-O-050316	500	468	94
C0065473	CGMN-GW-MW5-DP-050316	500	504	101
C0065474	CGMN-GW-MW5-LS-050316 Low Spike 0.1 ppb	100	90.8	91
C0065475	CGMN-GW-MW5-HS-050316 High Spike 1 ppb	1000	1170	117
C0065476 Spk M	CGMN-GW-MW7-O-050316	600	598	100
C0065476 Spk N	CGMN-GW-MW7-O-050316	1500	1590	106
C0065476	CGMN-GW-MW7-O-050316	500	496	99
C0065476 Rep	CGMN-GW-MW7-O-050316	500	578	116
C0065477	CGMN-GW-MW7-DP-050316	500	532	106
C0065478	CGMN-GW-MW7-LS-050316 Low Spike 0.1 ppb	100	113	113
C0065479	CGMN-GW-MW7-HS-050316 High Spike 1 ppb	1000	1160	116

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Water Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/L)	^{13}C-PFOA Amount Recovered (ng/L)	^{13}C-PFOA Recovery (%)
C0065480 Spk C	CGMN-GW-MW2-O-050315	1000	1030	103
C0065480 Spk D	CGMN-GW-MW2-O-050315	5500	7020	128
C0065480	CGMN-GW-MW2-O-050315	500	466	93
C0065480 Rep	CGMN-GW-MW2-O-050315	500	611	122
C0065481	CGMN-GW-MW2-DP-050315	500	574	115
C0065482	CGMN-GW-MW2-LS-050315 Low Spike 0.5 ppb	500	493	99
C0065483	CGMN-GW-MW2-HS-050315 High Spike 5 ppb	5000	6390	128
C0065484 Spk E	CGMN-GW-MW9-O-050315	1000	982	98
C0065484 Spk F	CGMN-GW-MW9-O-050315	5500	6200	113
C0065484	CGMN-GW-MW9-O-050315	500	491	98
C0065484 Rep	CGMN-GW-MW9-O-050315	500	514	103
C0065485	CGMN-GW-MW9-DP-050315	500	537	107
C0065486	CGMN-GW-MW9-LS-050315 Low Spike 0.5 ppb	500	502	100
C0065487	CGMN-GW-MW9-HS-050315 High Spike 5 ppb	5000	5740	115
C0065488 Spk G	CGMN-GW-MW12-O-050315	1500	1490	99
C0065488 Spk H	CGMN-GW-MW12-O-050315	10500	11100	106
C0065488	CGMN-GW-MW12-O-050315	500	345	69
C0065488 Rep	CGMN-GW-MW12-O-050315	500	336	67
C0065489	CGMN-GW-MW12-DP-050315	500	315	63
C0065490	CGMN-GW-MW12-LS-050315 Low Spike 1 ppb	1000	1160	116
C0065491	CGMN-GW-MW12-HS-050315 High Spike 10 ppb	10000	12200	122
C0065492 Spk I	CGMN-GW-PZ14-O-050315	1500	1800	120
C0065492 Spk J	CGMN-GW-PZ14-O-050315	10500	15000	143
C0065492	CGMN-GW-PZ14-O-050315	500	507	101
C0065492 Rep	CGMN-GW-PZ14-O-050315	500	513	103
C0065493	CGMN-GW-PZ14-DP-050315	500	560	112
C0065494	CGMN-GW-PZ14-LS-050315 Low Spike 1 ppb	1000	1310	131
C0065495	CGMN-GW-PZ14-HS-050315 High Spike 10 ppb	10000	14300	143
C0065496 Spk K	CGMN-GW-MW17-O-050315	1000	1040	104
C0065496 Spk L	CGMN-GW-MW17-O-050315	5500	6010	109
C0065496	CGMN-GW-MW17-O-050315	500	516	103
C0065496 Rep	CGMN-GW-MW17-O-050315	500	530	106
C0065497	CGMN-GW-MW17-DP-050315	500	592	118
C0065498	CGMN-GW-MW17-LS-050315 Low Spike 0.5 ppb	500	488	98
C0065499	CGMN-GW-MW17-HS-050315 High Spike 5 ppb	5000	5940	119
C0065500 Spk M	CGMN-GW-MW18-O-050315	1000	994	99
C0065500 Spk N	CGMN-GW-MW18-O-050315	5500	5860	107
C0065500	CGMN-GW-MW18-O-050315	500	434	87
C0065500 Rep	CGMN-GW-MW18-O-050315	500	450	90
C0065501	CGMN-GW-MW18-DP-050315	500	516	103
C0065502	CGMN-GW-MW18-LS-050315 Low Spike 0.5 ppb	500	496	99
C0065503	CGMN-GW-MW18-HS-050315 High Spike 5 ppb	5000	6160	123
C0065504	CGMN-GW-TRIP2-O-050315	500	541	108
C0065505	CGMN-GW-TRIP2-LS-050315 Low Spike 1 ppb	1000	1110	111
C0065506	CGMN-GW-TRIP2-HS-050315 High Spike 10 ppb	10000	11000	110

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Water Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/L)	^{13}C-PFOA Amount Recovered (ng/L)	^{13}C-PFOA Recovery (%)
C0065973 Spk C	CGMN-GW-MW11-O-050312	1500	1720	115
C0065973 Spk D	CGMN-GW-MW11-O-050312	10500	12800	122
C0065973	CGMN-GW-MW11-O-050312	500	415	83
C0065973 Rep	CGMN-GW-MW11-O-050312	500	418	84
C0065974	CGMN-GW-MW11-DP-050312	500	432	86
C0065975	CGMN-GW-MW11-LS-050312 Low Spike 1 ppb	1000	1230	123
C0065976	CGMN-GW-MW11-HS-050312 High Spike 10 ppb	10000	13200	132
C0065977 Spk E	CGMN-GW-MW101-O-050312	100500	139000	138
C0065977 Spk F	CGMN-GW-MW101-O-050312	1000500	1810000	181
C0065977	CGMN-GW-MW101-O-050312	500	296	59
C0065977 Rep	CGMN-GW-MW101-O-050312	500	284	57
C0065978	CGMN-GW-MW101-DP-050312	500	262	52
C0065979	CGMN-GW-MW101-LS-050312 Low Spike 100 ppb	100000	112000	112
C0065980	CGMN-GW-MW101-HS-050312 High Spike 1000 ppb	1000000	1090000	109
C0065981 Spk G	CGMN-GW-MW102-O-050312	100500	135000	134
C0065981 Spk H	CGMN-GW-MW102-O-050312	1000500	1590000	159
C0065981	CGMN-GW-MW102-O-050312	500	336	67
C0065981 Rep	CGMN-GW-MW102-O-050312	500	342	68
C0065982	CGMN-GW-MW102-DP-050312	500	348	70
C0065983	CGMN-GW-MW102-LS-050312 Low Spike 100 ppb	100000	134000	134
C0065984	CGMN-GW-MW102-HS-050312 High Spike 1000 ppb	1000000	1200000	120
C0065985 Spk I	CGMN-GW-MW13-O-050312	1500	1810	121
C0065985 Spk J	CGMN-GW-MW13-O-050312	10500	13800	131
C0065985	CGMN-GW-MW13-O-050312	500	488	98
C0065985 Rep	CGMN-GW-MW13-O-050312	500	489	98
C0065986	CGMN-GW-MW13-DP-050312	500	641	128
C0065987	CGMN-GW-MW13-LS-050312 Low Spike 1 ppb	1000	1250	125
C0065988	CGMN-GW-MW13-HS-050312 High Spike 10 ppb	10000	14300	143
C0065989 Spk K	CGMN-GW-MW16-O-050312	1500	1780	119
C0065989 Spk L	CGMN-GW-MW16-O-050312	10500	12900	123
C0065989	CGMN-GW-MW16-O-050312	500	508	102
C0065989 Rep	CGMN-GW-MW16-O-050312	500	510	102
C0065990	CGMN-GW-MW16-DP-050312	500	465	93
C0065991	CGMN-GW-MW16-LS-050312 Low Spike 1 ppb	1000	1770	177
C0065992	CGMN-GW-MW16-HS-050312 High Spike 10 ppb	10000	13700	137
C0065993 Spk C	CGMN-GW-MW15-O-050312	1500	1640	109
C0065993 Spk D	CGMN-GW-MW15-O-050312	10500	11100	106
C0065993	CGMN-GW-MW15-O-050312	500	470	94
C0065993 Rep	CGMN-GW-MW15-O-050312	500	502	100
C0065994	CGMN-GW-MW15-DP-050312	500	473	95
C0065995	CGMN-GW-MW15-LS-050312 Low Spike 1 ppb	1000	978	98
C0065996	CGMN-GW-MW15-HS-050312 High Spike 10 ppb	10000	13100	131

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Water Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery (%)
C0065930	CGMN-GW-TRIP1-O-050314	500	517	103
C0065931	CGMN-GW-TRIP1-LS-050314 Low Spike 0.5 ppb	500	503	101
C0065932	CGMN-GW-TRIP1-HS-050314 High Spike 5 ppb	5000	5360	107
C0065933 Spk E	CGMN-GW-PW1-O-050314	1500	1530	102
C0065933 Spk F	CGMN-GW-PW1-O-050314	10500	11600	110
C0065933	CGMN-GW-PW1-O-050314	500	410	82
C0065933 Rep	CGMN-GW-PW1-O-050314	500	412	82
C0065934	CGMN-GW-PW1-DP-050314	500	424	85
C0065935	CGMN-GW-PW1-LS-050314 Low Spike 1 ppb	1000	1130	113
C0065936	CGMN-GW-PW1-HS-050314 High Spike 10 ppb	10000	10800	108
C0065937 Spk G	CGMN-GW-PW2-O-050314	1000	873	87
C0065937 Spk H	CGMN-GW-PW2-O-050314	5500	5580	101
C0065937	CGMN-GW-PW2-O-050314	500	401	80
C0065937 Rep	CGMN-GW-PW2-O-050314	500	419	84
C0065938	CGMN-GW-PW2-DP-050314	500	463	93
C0065939	CGMN-GW-PW2-LS-050314 Low Spike 0.5 ppb	500	481	96
C0065940	CGMN-GW-PW2-HS-050314 High Spike 5 ppb	5000	5140	103
C0065941 Spk I	CGMN-GW-PW3-O-050314	600	474	79
C0065941 Spk J	CGMN-GW-PW3-O-050314	1500	1440	96
C0065941	CGMN-GW-PW3-O-050314	500	363	73
C0065941 Rep	CGMN-GW-PW3-O-050314	500	426	85
C0065942	CGMN-GW-PW3-DP-050314	500	549	110
C0065943	CGMN-GW-PW3-LS-050314 Low Spike 0.1 ppb	100	99.2	99
C0065944	CGMN-GW-PW3-HS-050314 High Spike 1 ppb	1000	1050	105
C0065945 Spk K	CGMN-GW-PW4-O-050314	1000	881	88
C0065945 Spk L	CGMN-GW-PW4-O-050314	5500	5580	101
C0065945	CGMN-GW-PW4-O-050314	500	443	89
C0065945 Rep	CGMN-GW-PW4-O-050314	500	432	86
C0065947	CGMN-GW-PW4-O-050314 Dup	500	462	92
C0065948	CGMN-GW-PW4-LS-050314 Low Spike 0.5 ppb	500	444	89
C0065949	CGMN-GW-PW4-HS-050314 High Spike 5 ppb	5000	5160	103
C0065950 Spk C	CGMN-GW-PW5-O-050314	10500	10700	102
C0065950 Spk D	CGMN-GW-PW5-O-050314	100500	113000	112
C0065950	CGMN-GW-PW5-O-050314	500	429	86
C0065950 Rep	CGMN-GW-PW5-O-050314	500	430	86
C0065951	CGMN-GW-PW5-DP-050314	500	443	89
C0065952	CGMN-GW-PW5-LS-050314 Low Spike 10 ppb	10000	10900	109
C0065953	CGMN-GW-PW5-HS-050314 High Spike 100 ppb	100000	105000	105
C0065954 Spk E	CGMN-GW-PW6-O-050314	10500	10500	100
C0065954 Spk F	CGMN-GW-PW6-O-050314	100500	109000	108
C0065954	CGMN-GW-PW6-O-050314	500	301	60
C0065954 Rep	CGMN-GW-PW6-O-050314	500	301	60
C0065955	CGMN-GW-PW6-DP-050314	500	294	59
C0065956	CGMN-GW-PW6-LS-050314 Low Spike 10 ppb	10000	9300	93
C0065957	CGMN-GW-PW6-HS-050314 High Spike 100 ppb	100000	91600	92

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Water Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery (%)
C0065958 Spk G	CGMN-GW-PW8-O-050314	600	542	90
C0065958 Spk H	CGMN-GW-PW8-O-050314	1500	1530	102
C0065958	CGMN-GW-PW8-O-050314	500	446	89
C0065958 Rep	CGMN-GW-PW8-O-050314	500	519	104
C0065959	CGMN-GW-PW8-DP-050314	500	450	90
C0065960	CGMN-GW-PW8-LS-050314 Low Spike 0.1 ppb	100	96.2	96
C0065961	CGMN-GW-PW8-HS-050314 High Spike 1 ppb	1000	942	94
C0065962 Spk I	CGMN-GW-B116-O-050314	10500	10900	104
C0065962 Spk J	CGMN-GW-B116-O-050314	100500	53400	53
C0065962	CGMN-GW-B116-O-050314	500	390	78
C0065962 Rep	CGMN-GW-B116-O-050314	500	449	90
C0065963	CGMN-GW-B116-DP-050314	500	462	92
C0065964	CGMN-GW-B116-LS-050314 Low Spike 10 ppb	10000	11400	114
C0065965	CGMN-GW-B116-HS-050314 High Spike 100 ppb	100000	91900	92
C0065966 Spk K	CGMN-PW-CWD-O-050314	10500	11500	110
C0065966 Spk L	CGMN-PW-CWD-O-050314	100500	56700	56
C0065966	CGMN-PW-CWD-O-050314	500	450	90
C0065966 Rep	CGMN-PW-CWD-O-050314	500	472	94
C0065967	CGMN-PW-CWD-DP-050314	500	473	95
C0065968	CGMN-PW-CWD-LS-050314 Low Spike 10 ppb	10000	11300	113
C0065969	CGMN-PW-CWD-HS-050314 High Spike 100 ppb	100000	92600	93
C0067856 Spk C	CGMN-GW-CWD-O-050405	1500	1430	95
C0067856 Spk D	CGMN-GW-CWD-O-050405	10500	9450	90
C0067856	CGMN-GW-CWD-O-050405	500	409	82
C0067856 Rep	CGMN-GW-CWD-O-050405	500	395	79
C0067857	CGMN-GW-CWD-DP-050405	500	473	95
C0067858	CGMN-GW-CWD-LS-050405 Low Spike 1 ppb	1000	993	99
C0067859	CGMN-GW-CWD-HS-050405 High Spike 101 ppb	10000	7420	74
C0067860 Spk E	WBMN-GW-CWM-O-050405	1500	1420	95
C0067860 Spk F	WBMN-GW-CWM-O-050405	10500	9320	89
C0067860	WBMN-GW-CWM-O-050405	500	457	91
C0067860 Rep	WBMN-GW-CWM-O-050405	500	415	83
C0067861	WBMN-GW-CWM-DP-050405	500	429	86
C0067862	WBMN-GW-CWM-LS-050405 Low Spike 1 ppb	1000	850	85
C0067863	WBMN-GW-CWM-HS-050405 High Spike 10 ppb	10000	7950	80
C0067864 Spk G	WBMN-GW-R-2-O-050405	1500	1410	94
C0067864 Spk H	WBMN-GW-R-2-O-050405	10500	10100	96
C0067864	WBMN-GW-R-2-O-050405	500	466	93
C0067864 Rep	WBMN-GW-R-2-O-050405	500	422	84
C0067865	WBMN-GW-R-2-DP-050405	500	488	98
C0067866	WBMN-GW-R-2-LS-050405 Low Spike 1 ppb	1000	1130	113
C0067867	WBMN-GW-R-2-HS-050405 High Spike 10 ppb	10000	10600	106

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Water Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery (%)
C0067868 Spk C	WBMN-GW-R-3-O-050405	1500	1410	94
C0067868 Spk D	WBMN-GW-R-3-O-050405	10500	10300	98
C0067868	WBMN-GW-R-3-O-050405	500	463	93
C0067868 Rep	WBMN-GW-R-3-O-050405	500	453	91
C0067869	WBMN-GW-R-3-DP-050405	500	492	98
C0067870	WBMN-GW-R-3-LS-050405 Low Spike 1 ppb	1000	961	96
C0067871	WBMN-GW-R-3-HS-050405 High Spike 10 ppb	10000	10000	100
C0067872 Spk E	WBMN-GW-R-1-O-050405	1500	1500	100
C0067872 Spk F	WBMN-GW-R-1-O-050405	10500	10500	100
C0067872	WBMN-GW-R-1-O-050405	500	375	75
C0067872 Rep	WBMN-GW-R-1-O-050405	500	401	80
C0067873	WBMN-GW-R-1-DP-050405	500	450	90
C0067875	WBMN-GW-R-1-LS-050405 Low Spike 1 ppb	1000	1070	107
C0067874	WBMN-GW-R-1-HS-050405 High Spike 10 ppb	10000	11300	113
C0067876 Spk G	WBMN-GW-R-4-O-050405	1500	1460	97
C0067876 Spk H	WBMN-GW-R-4-O-050405	10500	10000	95
C0067876	WBMN-GW-R-4-O-050405	500	418	84
C0067876 Rep	WBMN-GW-R-4-O-050405	500	400	80
C0067877	WBMN-GW-R-4-DP-050405	500	470	94
C0067878	WBMN-GW-R-4-LS-050405 Low Spike 1 ppb	1000	779	78
C0067879	WBMN-GW-R-4-HS-050405 High Spike 10 ppb	10000	8290	83
C0067882	WBMN-GW-Field-Blank-050405	500	547	109
C0067880	WBMN-GW-Field-Blank-LS-050405 Low Spike 1 ppb	1000	1160	116
C0067881	WBMN-GW-Field-Blank-HS-050405 High Spike 10 ppb	10000	11300	113
			Average:	99
			Standard Deviation:	18

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

FIGURES

Figure 1. Typical Calibration Curve for PFOA in Reagent Water

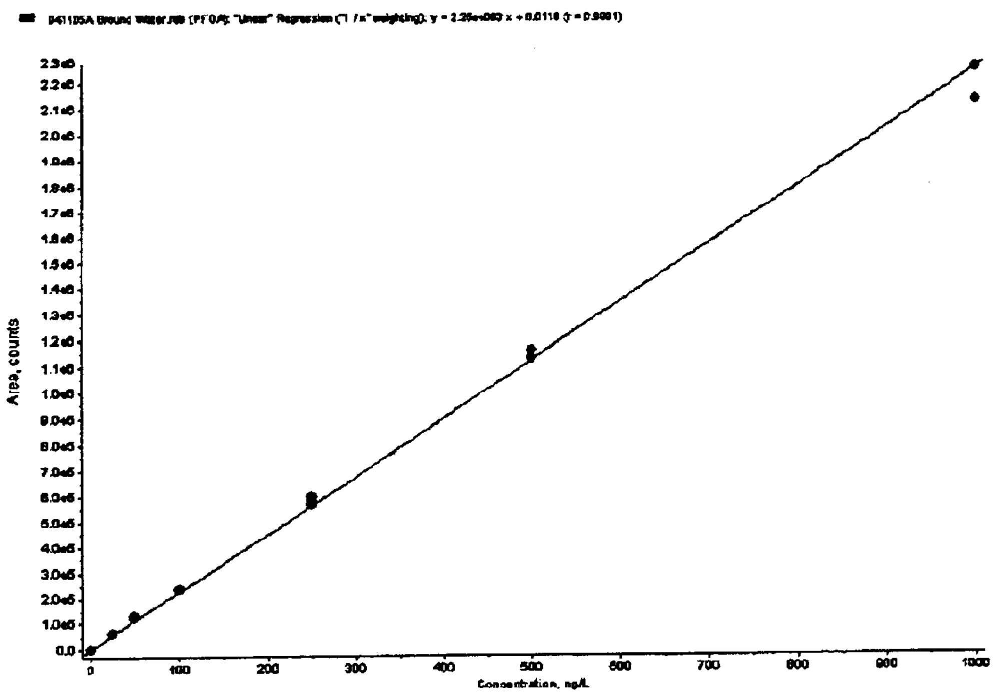

Figure 2. Extracted Standards of PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively

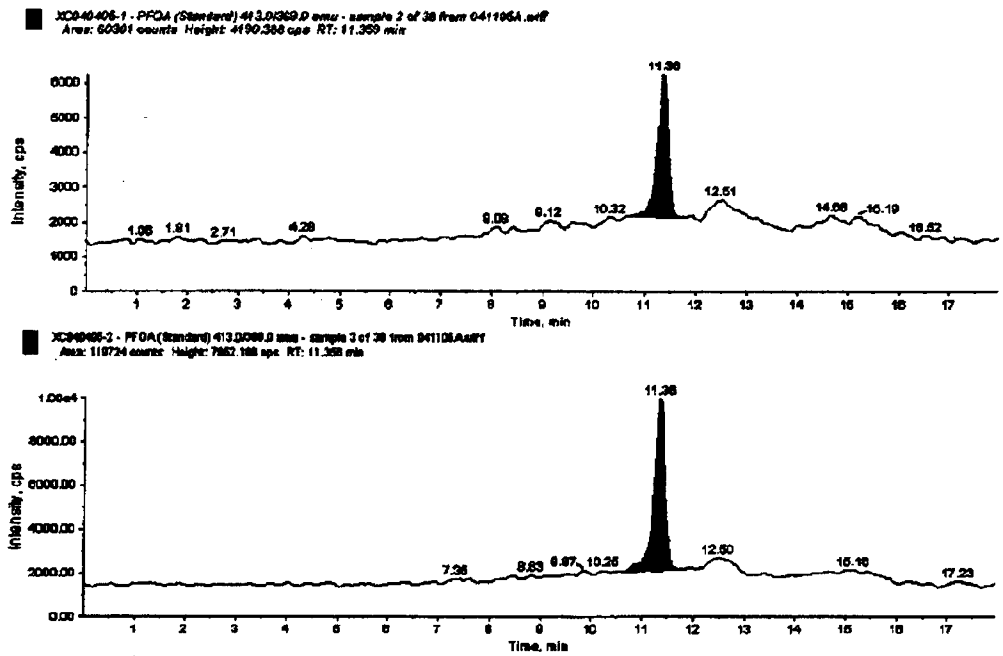

Figure 3. PFOA in Reagent Water, 50 ng/L Fortified Reagent Water, and 500 ng/L Fortified Reagent Water, Respectively

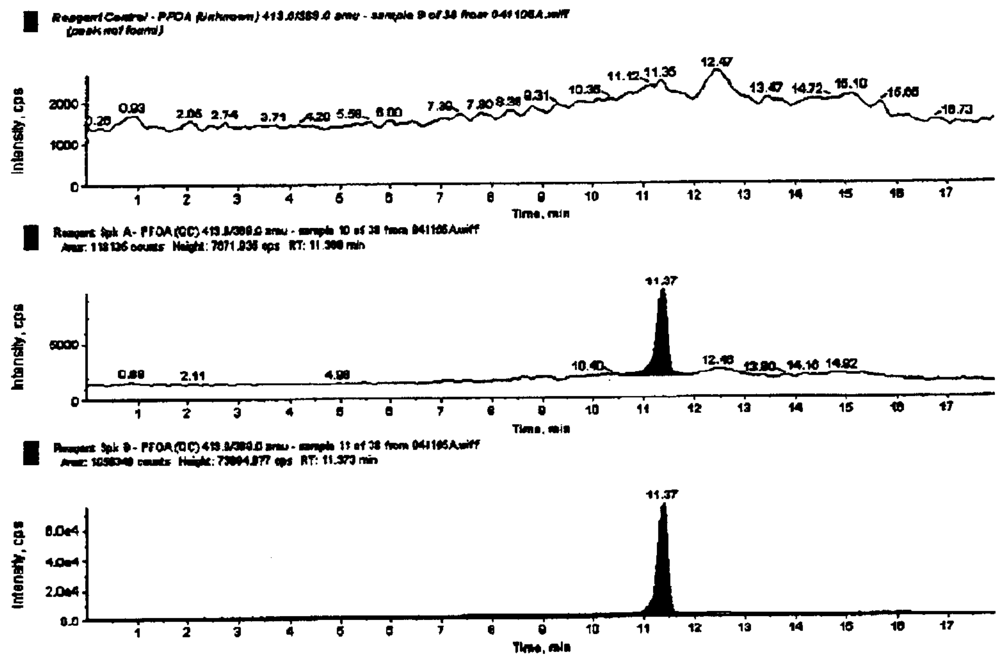

Figure 4. Chromatogram Representing a Woodbury Water Sample Analyzed for PFOA, DF=10 (Exygen ID: C0067860, Data Set: 041105AR)

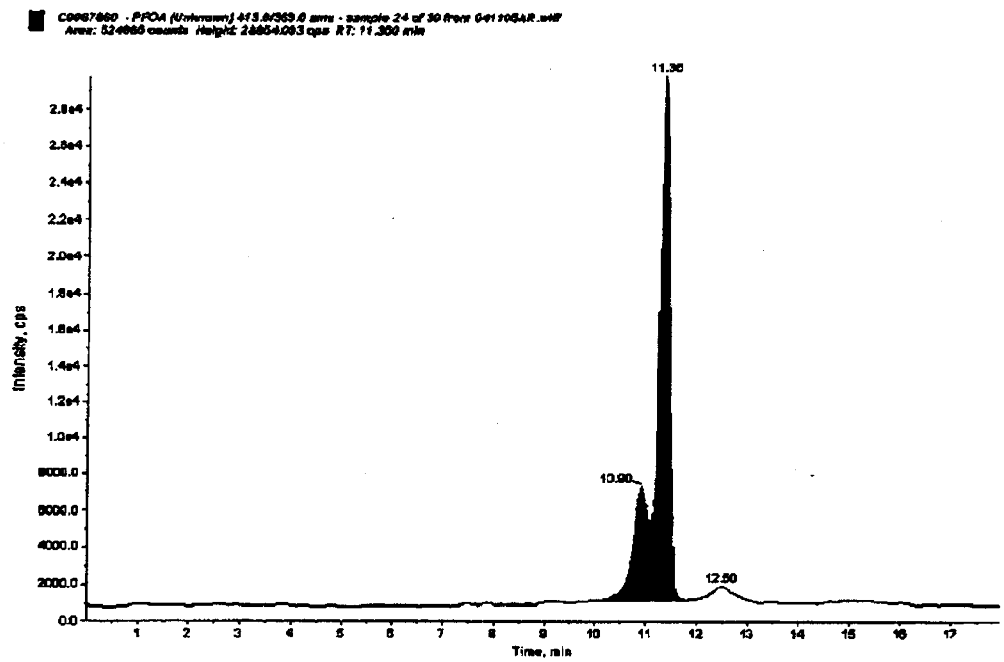

Figure 5. Typical Calibration Curve for ^{13}C PFOA in Reagent Water

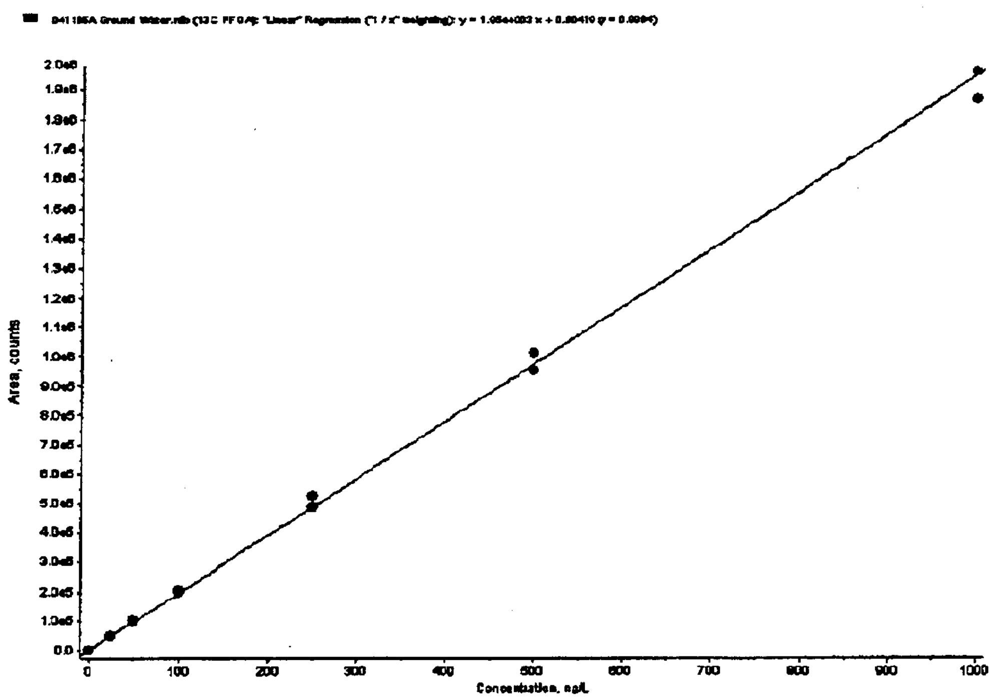

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Figure 6. Extracted Standards of ^{13}C PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively

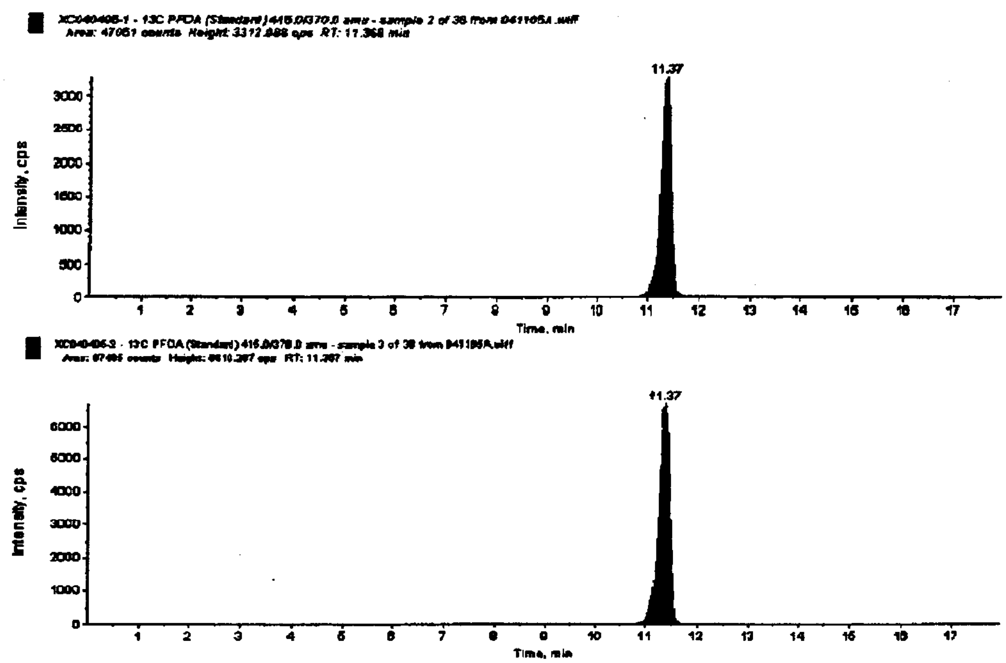


Figure 7. ^{13}C PFOA in Reagent Water, 50 ng/L Fortified Reagent Water Spk A, and 500 ng/L Fortified Reagent Water Spk B, Respectively

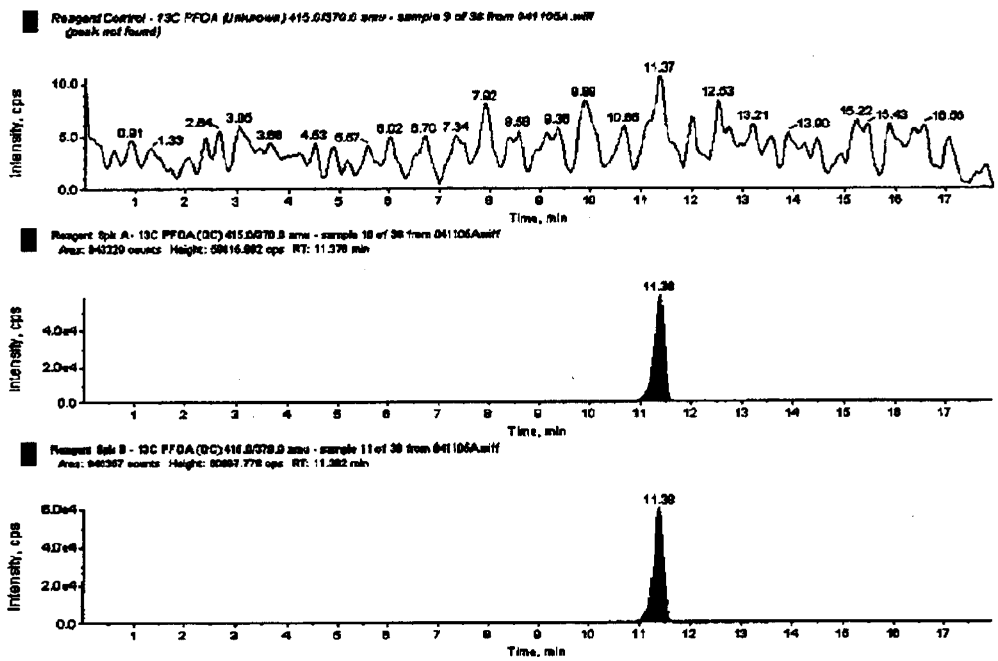


Figure 8. Chromatogram Representing a Woodbury Water Sample Analyzed for ^{13}C PFOA (Exygen ID: C0067860, Data Set: 041105A)

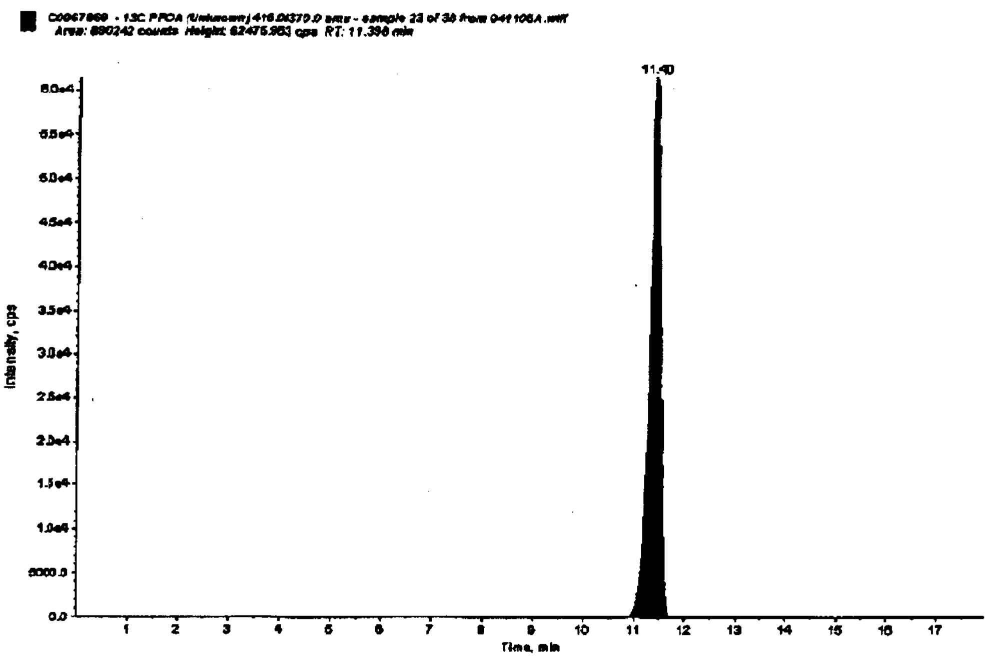


Figure 9. Typical Calibration Curve for PFBS in Reagent Water

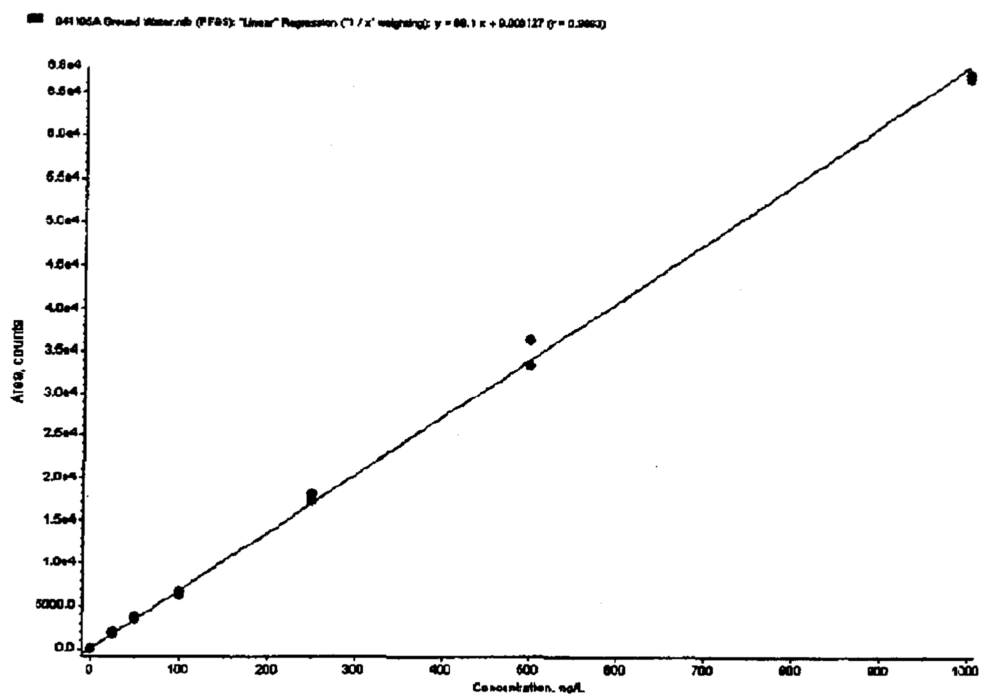


Figure 10. Extracted Standards of PFBS in Reagent Water, 25 ng/L and 50 ng/L, Respectively

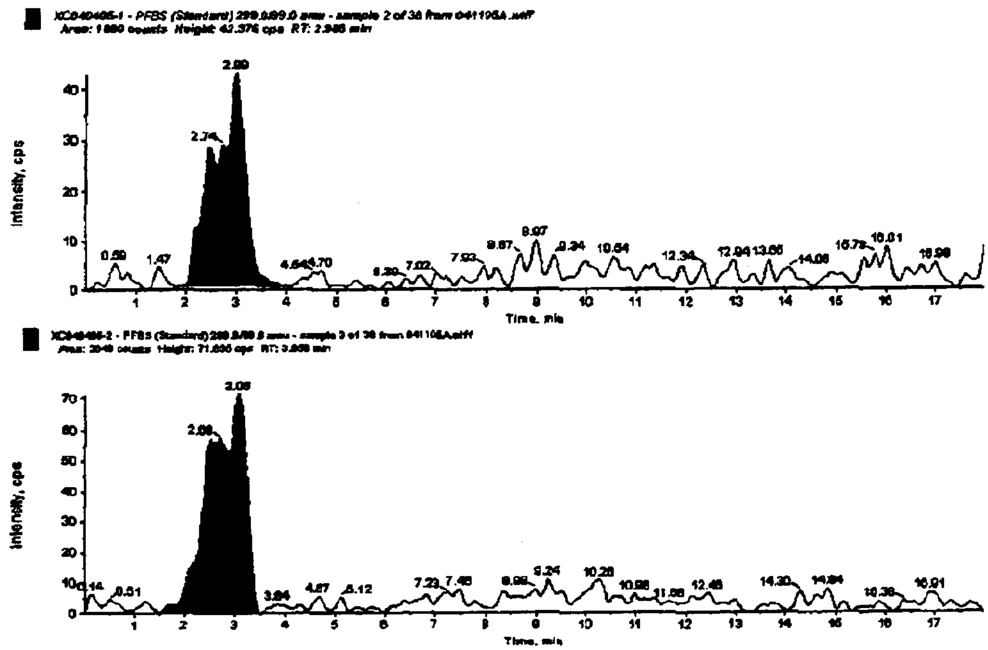


Figure 11. PFBS in Reagent Water, 50 ng/L Fortified Reagent Water, and 500 ng/L Fortified Reagent Water, Respectively

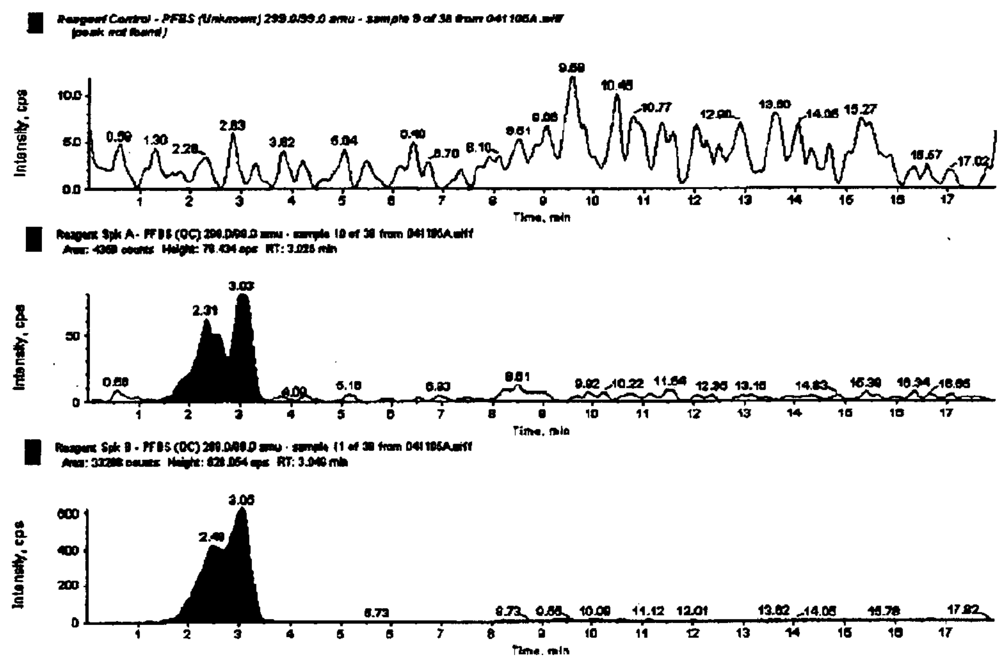


Figure 12. Chromatogram Representing a Woodbury Water Sample Analyzed for PFBS, DF=10 (Exygen ID: C0067860, Data Set: 041105AR)

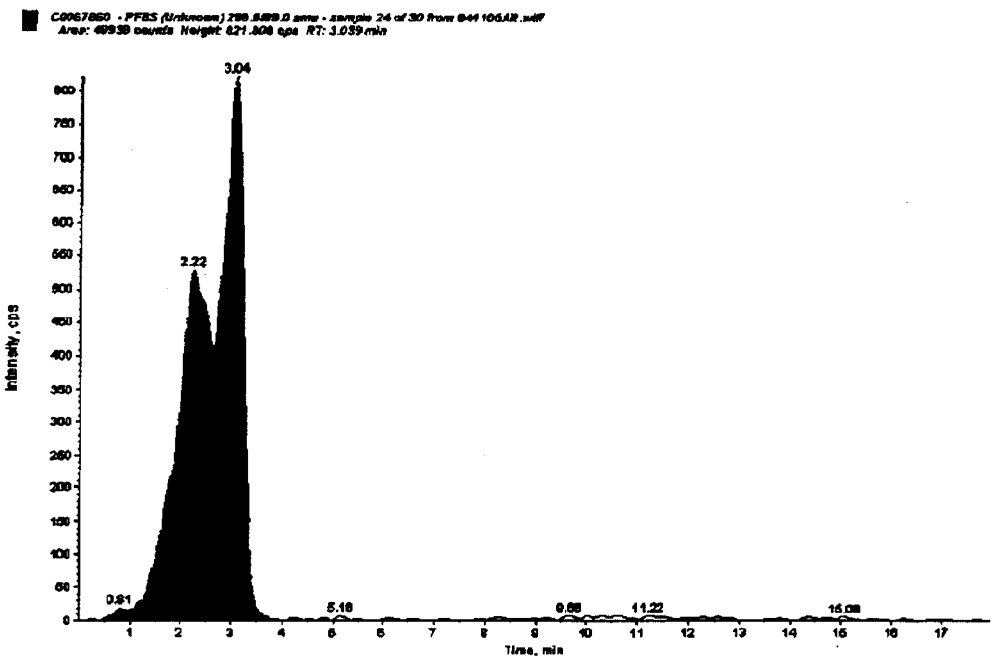


Figure 13. Typical Calibration Curve for PFHS in Reagent Water

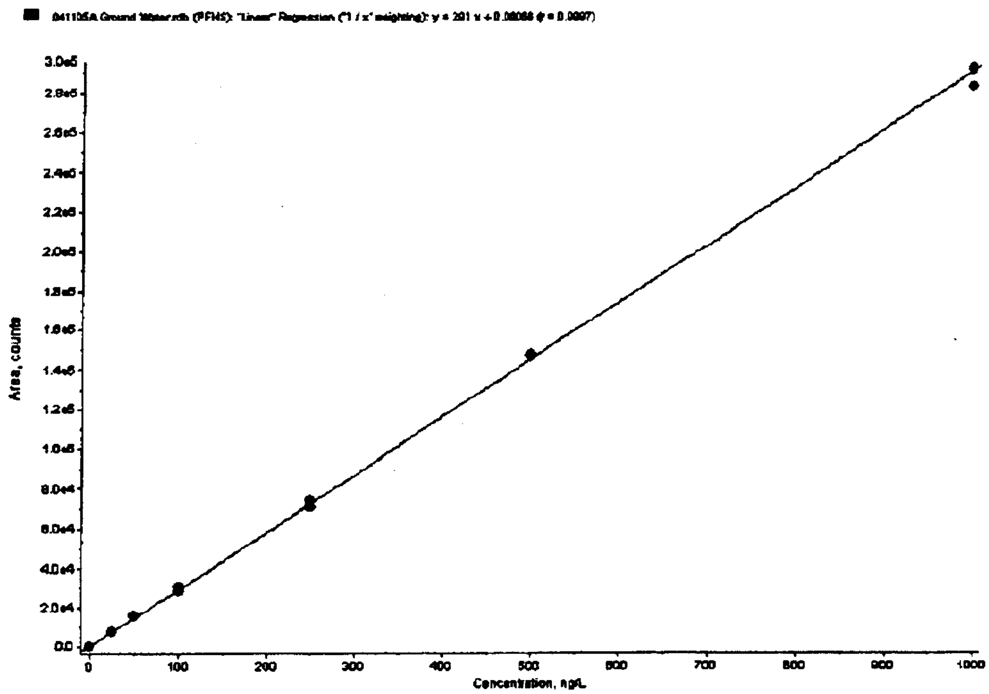
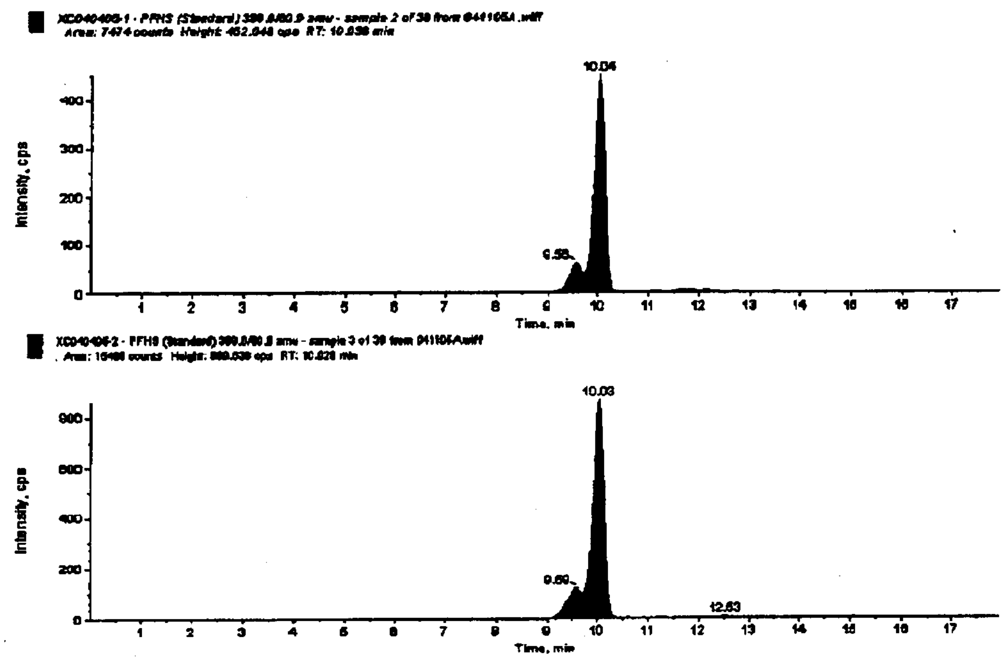


Figure 14. Extracted Standards of PFHS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



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2095.0245

Figure 15. PFHS in Reagent Water, 50 ng/L Fortified Reagent Water, and 500 ng/L Fortified Reagent Water, Respectively

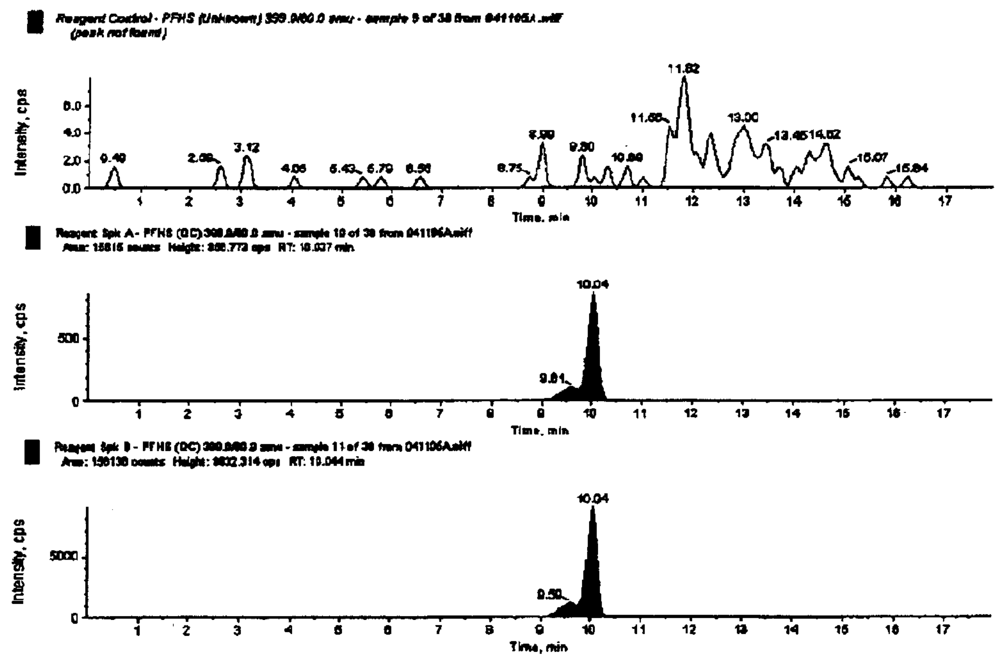


Figure 16. Chromatogram Representing a Woodbury Water Sample Analyzed for PFHS, DF=100 (Exygen ID: C0067860, Data Set: 041105AR)

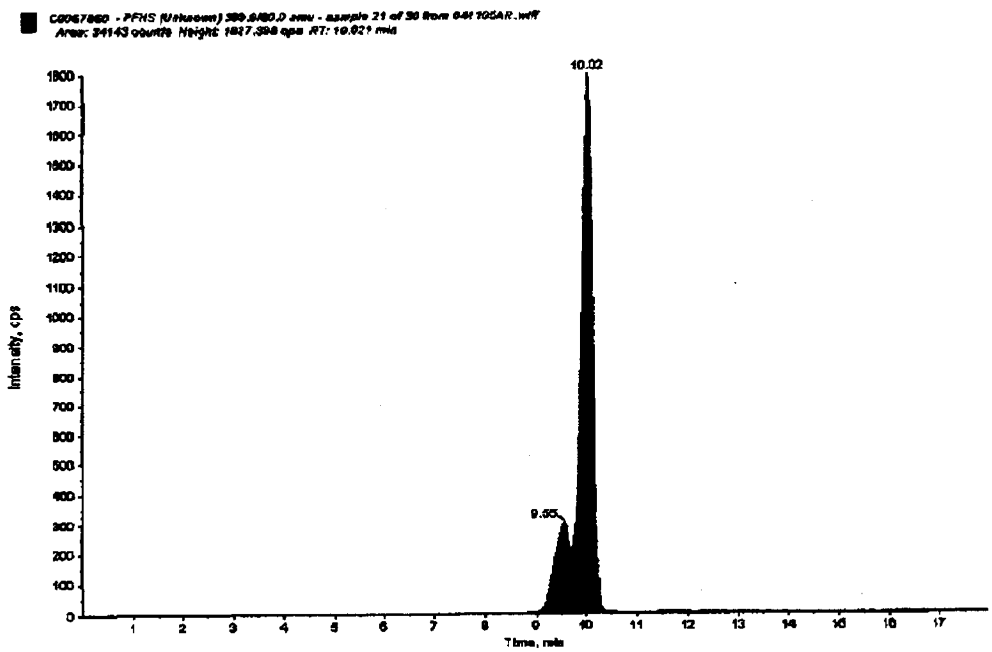
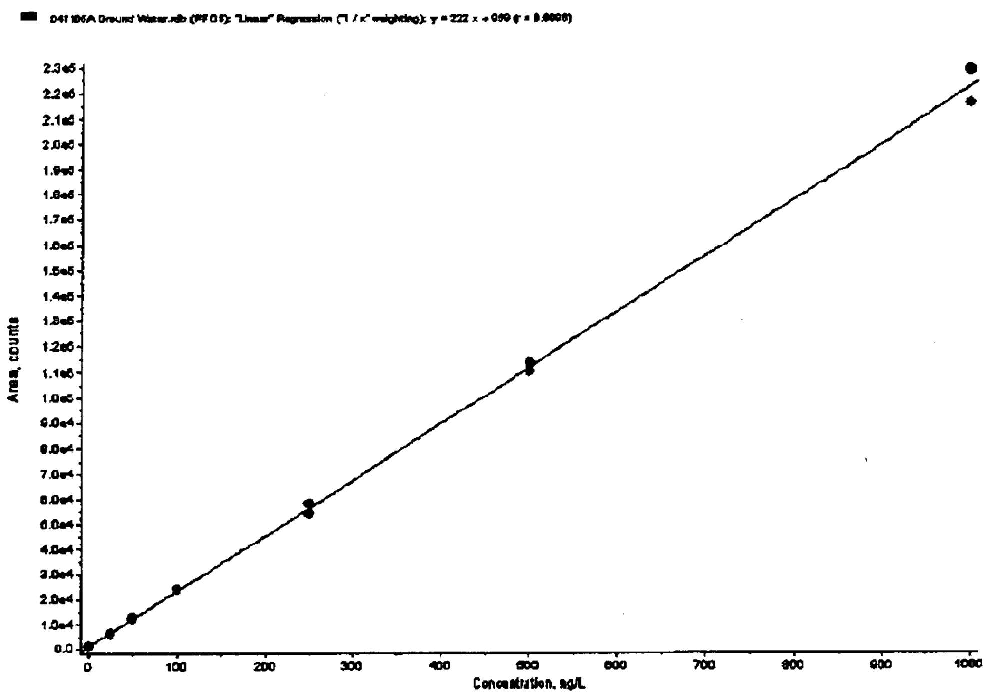


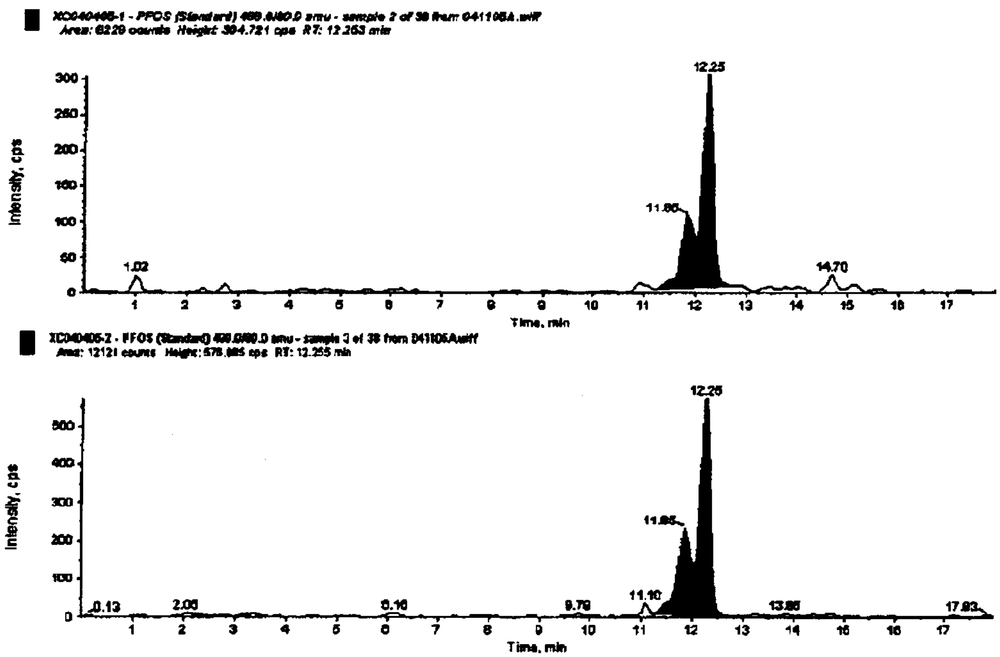
Figure 17. Typical Calibration Curve for PFOS in Reagent Water



3MA01552025

2095.0248

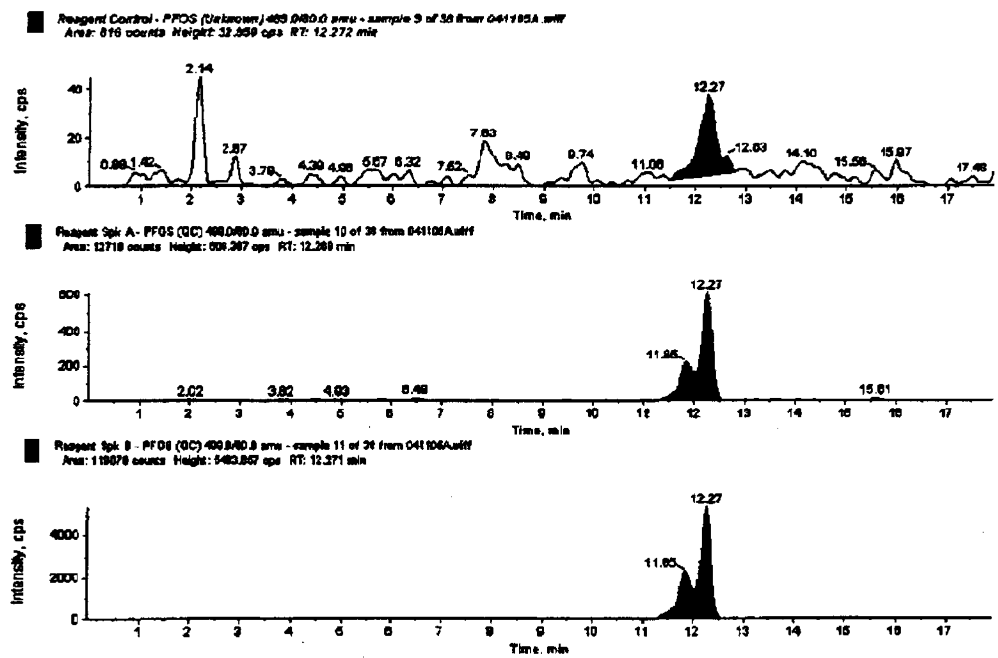
Figure 18. Extracted Standards of PFOS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



3MA01552026

2095.0249

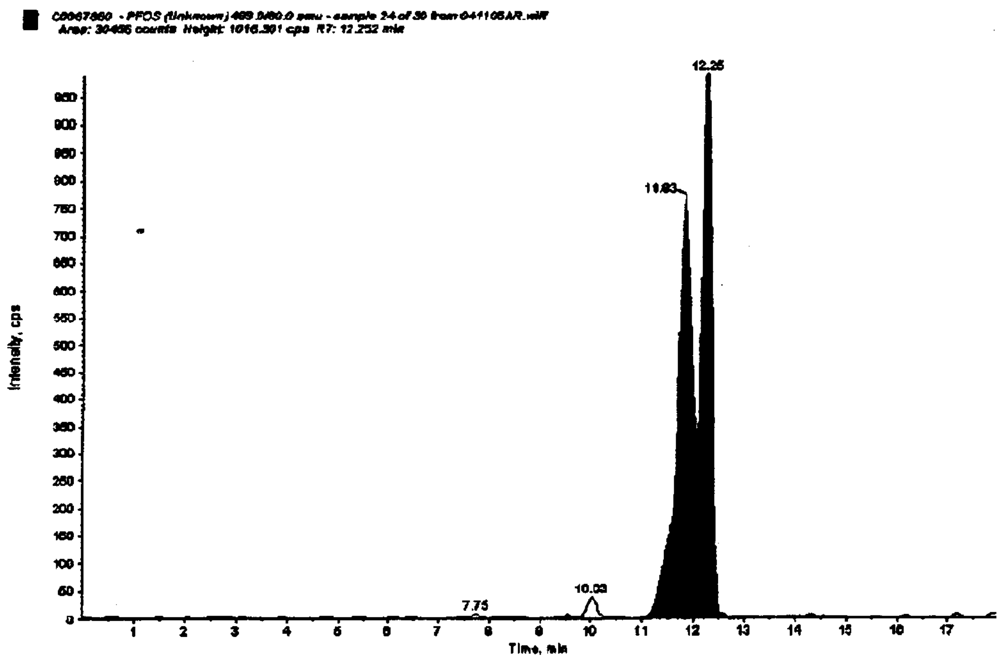
Figure 19. PFOS in Reagent Water, 50 ng/L Fortified Reagent Water, and 500 ng/L Fortified Reagent Water, Respectively



3MA01552027

2095.0250

Figure 20. Chromatogram Representing a Woodbury Water Sample Analyzed for PFOS, DF=10 (Exygen ID: C0067860, Data Set: 041105AR)



INTERIM REPORT #4 - Analysis of Cottage Grove Soil and Water Samples

STUDY TITLE

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

DATA REQUIREMENTS

EPA TSCA Good Laboratory Practice Standards 40 CFR 792

STUDY DIRECTOR

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INTERIM REPORT COMPLETION DATE

December 1, 2005

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St. Paul, MN 55144
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PROJECT

Protocol Number: P0001400
Exygen Study Number: P0001400

Total Pages: 177

GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

Exygen Study Number P0001400, entitled "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program," conducted for 3M Company, is being performed in compliance with EPA TSCA Good Laboratory Practice Standards 40 CFR 792 by Exygen Research.

John M Flaherty

John Flaherty
Principal Investigator
Exygen Research

12/1/05
Date

Kesari

Jaisimha Kesari P.E., DEE
Study Director
Weston Solutions, Inc.

12/5/05
Date

R.A. Paschke

Robert A. Paschke
Sponsor Representative
3M Company

12/2/05
Date

QUALITY ASSURANCE STATEMENT

Exygen Research's Quality Assurance Unit reviewed Exygen Study Number P0001400, entitled, "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program". All reviewed phases[1] were inspected for conduct according to Exygen Research's Standard Operating Procedures, the Study Protocol, and all applicable Good Laboratory Practice Standards. All findings were reported to the Exygen Principal Investigator and Management and to the Study Director.

Phase	Date Inspected	Date Reported to Principal Investigator	Date Reported to Exygen Management	Date Reported to Study Director
10. Raw Data Review	11/02-07/05	11/08/05	11/09/05	11/09/05
11. Raw Data Review	11/08/05	11/08/05	11/09/05	11/09/05
12. Final Interim Raw Data and Analytical Report Review	11/09/05	11/09/05	11/09/05	11/09/05

Lydia Shaffer

Lydia Shaffer
Technical Lead, Quality Assurance Unit

12/01/05
Date

[1]Note: All in-lab inspections will be documented in the QA statement for the final analytical report at the conclusion of the study. This QA statement involves only the review of the interim report and associated raw data.

CERTIFICATION OF AUTHENTICITY

This interim report, for Exygen Study Number P0001400, is a true and complete representation of the raw data.

Submitted by: Exygen Research
3058 Research Drive
State College, PA 16801
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John Flaherty
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12/1/05
Date

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1-DEC-05
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Jaisimha Kesari P.E., DEE
Weston Solutions, Inc.

12/5/05
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Robert A. Paschke
Manager, 3M Corporate Environmental Programs

12/2/05
Date

STUDY IDENTIFICATION

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

PROTOCOL NUMBER:	P0001400
EXYGEN STUDY NUMBER:	P0001400
TYPE OF STUDY:	Residue
SAMPLE MATRIX:	Soil and Water
TEST SUBSTANCE:	Perfluorooctanoic acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS)
SPONSOR:	3M Company 3M Building 0236-01-B-10 St. Paul, MN 55144
STUDY DIRECTOR:	Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380
STUDY MONITOR:	Robert A. Paschke 3M Company 3M Building 42-02-E-27 St. Paul, MN 55144
PERFORMING LABORATORY:	Exygen Research 3058 Research Drive State College, PA 16801
ANALYTICAL PHASE TIMETABLE:	Study Initiation Date: 03/03/05 Interim Analytical Start Date: 08/08/05 Interim Analytical Termination Date: 10/01/05 Interim Report Completion Date: 12/01/05

PROJECT PERSONNEL

The Study Director for this project is Jaisimha Kesari at Weston Solutions, Inc. The following personnel from Exygen Research were associated with various phases of this interim portion of the study:

Name	Title
John Flaherty	Vice President
Karen Risha	Laboratory Supervisor
Chrissy Edwards	Technician
Mark Ammerman	Sample Custodian
Amy Sheehan	Associate Scientist
Eric Edwards	Sample Custodian
Mindy Cressley	Technician
Brittany Kravets	Technician

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1.0 SUMMARY

Exygen Research extracted and analyzed soil and water samples for the determination of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) according to Exygen Methods V0001781 and V0001780, respectively (**Appendix A**).

Several of the analyzed samples were not reported due to quality control failure. Samples failed because the PFOA and ^{13}C PFOA surrogate spikes were too low relative to the endogenous level in the sample to allow assessment of matrix interference or failed the eligibility criteria for reporting (see **Section 8.0**). Assessed accuracies for the remaining soil samples can be found in **Table I**.

The limit of quantitation for PFOA, PFBS, PFHS and PFOS in soil was 0.4 ng/g (wet weight) and the limit of detection for PFOA, PFBS, PFHS and PFOS in soil was 0.2 ng/g (wet weight). The limit of quantitation for PFOA, PFBS, PFHS and PFOS in water was 50 ng/L and the limit of detection for PFOA, PFBS, PFHS and PFOS in water was 25 ng/L.

Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in soil samples are summarized in **Table I**. Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in ground water samples are summarized in **Table II**. Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in rinse blank samples are summarized in **Table III**.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the soil samples are detailed in **Tables IV and V**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the soil samples were 86 ± 17%, 84 ± 9%, 88 ± 10% and 85 ± 16%, respectively. Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the ground water samples are detailed in **Tables VI and VII**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the ground water samples were 98 ± 17%, 97 ± 10%, 103 ± 18% and 91 ± 17%, respectively.

Fortification recoveries for ^{13}C PFOA in the soil samples are detailed in **Table VIII**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the soil samples were 79 ± 12%. Fortification recoveries for ^{13}C PFOA in the ground water samples are detailed in **Table IX**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the ground water samples were 85 ± 30%. Fortification recoveries for ^{13}C PFOA in the rinse blank samples are detailed in **Table X**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the rinse blank samples were 78 ± 5%.

2.0 OBJECTIVE

The objective of the analytical part of this study was to determine levels of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) in soil and ground water according to Protocol P0001400 (**Appendix A**).

3.0 INTRODUCTION

This report details the results of the analysis for the determination of PFOA, PFBS, PFHS and PFOS in soil using the analytical method entitled, "V0001781: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Soil by LC/MS/MS" and in water using the analytical method entitled, "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS."

The study was initiated on March 03, 2005, when the study director signed protocol number P0001400. The analytical start date for this interim report was August 8, 2005, and the analytical termination date for this interim report was October 1, 2005.

4.0 ANALYTICAL TEST SAMPLES

One hundred and seventy-nine soil samples and fifty-two water samples (Exygen ID C0081163 – C0081285, C0081329 – C0081438) were received at ambient temperature on July 23, 2005 from Pat Ferretti at 3M Environmental Lab. Thirty-six ground water samples represented nine sample sites and associated field QC samples. Four samples represented decontamination water and associated field QC samples. Three water samples represented a trip blank and two trip blank spikes, and nine samples represented field rinse blanks supplied by Weston Solutions, Inc. that did not contain the surrogate, ^{13}C PFOA. The samples were logged in by Exygen personnel and placed in refrigerated storage.

Sample log-in and chain of custody information is located in the raw data package associated with this interim report. Storage records will be kept at Exygen Research.

5.0 REFERENCE MATERIAL

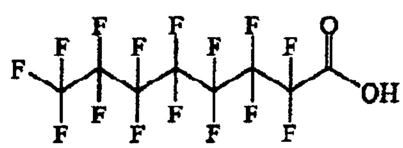
The analytical standard, PFOA, was purchased from Sigma Aldrich and was received at Exygen on December 08, 2003. The surrogate spiking standard, ^{13}C labeled perfluorooctanoic acid (^{13}C PFOA), was received at Exygen on April 15, 2004 from the 3M Company. 3M supplied the analytical standards PFBS and PFHS. PFBS was received from 3M at Exygen on May 13, 2005. PFHS was received from 3M at Exygen on January 20, 2003. PFOS was purchased from Fluka Corporation and was received at Exygen on April 23, 2003.

The available information for the reference materials is listed below. PFOA was stored ambient. PFBS, PFHS and ^{13}C PFOA were stored frozen and PFOS was stored refrigerated.

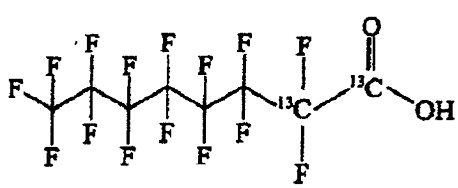
Compound	Exygen Inventory No.	Lot #	Purity (%)	Expiration Date
PFOA	SP0003800	23116HB	97.64	12/08/05
^{13}C PFOA	SP0004184	3507-195	97	03/29/09
PFBS	SP0005726	101	96.7	12/04/06
PFHS	SP0002401	SE036	98.6	10/18/06
PFOS	SP0002694	430180/1	101.2	04/23/06

The molecular structures of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS are given on the following pages:

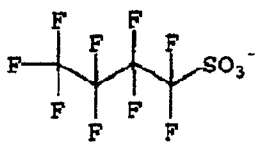
PFOA
Chemical Name: Perfluorooctanoic acid
Molecular Weight: 414
Transitions Monitored: 413 → 369 (for quantification) and
413 → 219 (for confirmation)
Structure:



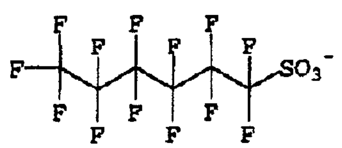
^{13}C PFOA
Chemical Name: 1,2-13C perfluorooctanoic acid
Molecular Weight: 416
Transition Monitored: 415 → 370
Structure:



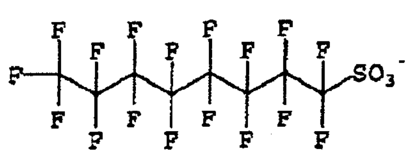
PFBS
Chemical Name: Perfluorobutanesulfonate
Molecular Weight: 338 supplied as the potassium salt ($C_4F_9SO_3^-K^+$)
Transitions Monitored: 299 → 99
Structure:



PFHS
Chemical Name: Perfluorohexanesulfonate
Molecular Weight: 438 supplied as the potassium salt ($C_6F_{13}SO_3^-K^+$)
Transitions Monitored: 399 → 80
Structure:



PFOS
Chemical Name: Perfluorooctanesulfonate
Molecular Weight: 538 supplied as the potassium salt ($C_8F_{17}SO_3^-K^+$)
Transitions Monitored: 499 → 80
Structure:



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6.0 DESCRIPTION OF ANALYTICAL METHOD

The analytical methods "V0001781: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Soil by LC/MS/MS" and "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS" were used for this study.

6.1 Extraction Procedure for Soil

Before the samples were weighed for the extraction, they were placed into a new, clean Ziploc bag and mixed thoroughly. The samples were then transferred back to the sampling container. A 5 gram portion of soil was weighed into a fifty milliliter centrifuge tube for the extraction. After fortification of appropriate samples, 5 mL of methanol was added to the samples. The samples were allowed to shake on a wrist action shaker for ~15 minutes and were then sonicated in an ultrasonic bath for ~15 minutes. The volume was taken to 40 mL with water and the samples were then centrifuged for ~10 minutes at ~3000 rpm. The supernatant was then loaded onto a C_{18} SPE cartridge conditioned with 10 mL of methanol and 5 mL of water. The eluate was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of eluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

6.2 Percent Solids Procedure For Soil

Percent solids were determined using the procedure indicated in Exygen method V0000427. Approximately 20 grams of sample was weighed into a pan. The weight of the sample plus the pan was recorded. The sample was then dried in an oven overnight at 104 ± 2 °C. Then the sample was transferred to a dessicator and allowed to cool for ~15 minutes. Each sample was then weighed again, including the weight of the pan. The percent solid for each sample was then calculated.

6.3 Extraction Procedure for Water

A 40 mL aliquot of the water sample was used for the extraction procedure. After fortification of appropriate samples, the samples were loaded onto a C_{18} SPE cartridge conditioned with 10 mL of methanol and 5 mL of water. The eluate was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of eluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

6.4 Preparation of Standards and Fortification Solutions

A mixed stock standard solution of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS was prepared at a concentration of 1000 µg/mL by dissolving 100 mg of each of the standards (corrected for purity and salt content, if necessary) in methanol. From this solution, a 100 µg/mL fortification standard solution was prepared by taking 10 mL of the stock and bringing the volume up to 100 mL with methanol. By taking 10 mL of the 100 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 10 µg/mL fortification standard was prepared. By taking 10 mL of the 10 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 1.0 µg/mL fortification standard were prepared. By taking 10 mL of the 1.0 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.1 µg/mL fortification standard was prepared. By taking 10 mL of the 0.1 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.01 µg/mL fortification standard were prepared.

A set of standards containing PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS were prepared in water and processed through the extraction procedure, identical to samples. The following concentrations were prepared:

Conc. of Fort Solution (ng/mL)[1]	Fort Volume (µL)	Volume of Fortified Sample (mL)	Final Conc. of Calibration Std. (ng/L)
0	0	40	0
10	100	40	25
10	200	40	50
10	400	40	100
100	100	40	250
100	200	40	500
100	400	40	1000

[1] of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS

An additional stock solution of ^{13}C PFOA was prepared at 100 µg/mL and diluted to 1.0 and 0.1 µg/mL for bottle spiking purposes. Complete details can be found in the raw data package associated with this study.

The stock standard solution and all fortification and calibration standard solutions were stored in a refrigerator (4° ± 2°C) when not in use. Documentation of standard preparation is located in the raw data package associated with this interim report.

6.5 Chromatography

Quantification of PFOA, PFBS, PFHS and PFOS was accomplished by LC/MS/MS electrospray. The retention time of PFOA, PFBS, PFHS and PFOS was ~10 min, ~0.5 mins, ~8.5 mins, and ~11 mins, respectively. Peaks above the LOD were not detected in any of the reagent blank samples corresponding to the analyte retention time.

6.6 Instrument Sensitivity

The smallest standard amount injected during the chromatographic run had a concentration of 25 ng/L of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS.

6.7 Description of LC/MS/MS Instrument and Operating Conditions

Instrument: API 4000 Biomolecular Mass Analyzer

Interface: Turbo Ion Spray Liquid Introduction Interface

Computer: DELL OptiPlex GX400

Software: Windows NT, Analyst 1.4.1

HPLC: Hewlett Packard (HP) Series 1100
- HP Quat Pump
- HP Vacuum Degasser
- HP Autosampler
- HP Column Oven

HPLC Column: Thermo Fluophase RP, 50 mm x 2.1 mm
Column Temp.: 30° C
Injection Vol.: 15 µL
Mobile Phase (A): 2 mM Ammonium Acetate in water
Mobile Phase (B): Methanol

Time (min)	%A	%B
0.0	65	35
1.0	65	35
8.0	25	75
10.0	25	75
11.0	65	35
18.0	65	35

Total run time: ~18 min
Flow Rate: 0.3 mL/min

Ions monitored:

Analyte	Mode	Transition Monitored	Approximate Retention Time (min)
PFOA	negative	413 → 369	~12 min.
PFOA Confirm Ion	negative	413 → 219	~12 min.
^{13}C PFOA	negative	415 → 370	~12 min.
PFBS	negative	299 → 99	~5 min.
PFHS	negative	399 → 80	~11 min.
PFOS	negative	499 → 80	~13 min.

6.8 Quantitation and Example Calculation

Fifteen microliters of sample or calibration standard were injected into the LC/MS/MS. The peak area was measured and the standard curve was generated (using 1/x fit weighted linear regression) by Analyst software using seven concentrations of standards. The concentration was determined from the equations below.

Equation 1 calculated the amount of analyte found (in ng/mL, based on peak area) using the standard curve (linear regression parameters) generated by the Analyst software program.

Equation 1:

$$\text{Analyte found (ng/L)} = \frac{\text{(Peak area - intercept)}}{\text{slope}} \times \text{DF}$$

Where: DF = Dilution Factor, factor by which the final volume was diluted, if necessary.

For samples fortified with known amounts of analyte prior to extraction, Equation 2 was used to calculate the percent recovery.

Equation 2:

Recovery (%) =

$$\frac{\text{(analyte found (ng/L) - analyte in control (ng/L))}}{\text{amount added (ng/L)}} \times 100\%$$

Note: For the analyte recovery calculation, the "control" is the unspiked aliquot of the primary field sample.

Equation 3 was used to convert the amount of analyte found in ng/mL to ng/g (ppb).

Equation 3:

$$\text{analyte found (ppb)} = \frac{[\text{analyte found (ppt)} \times \text{volume extracted (L)}]}{\text{sample weight (g)}}$$

Equation 4 was then used to calculate the amount of analyte found in ppb based on dry weight.

Equation 4:

Analyte found (ppb) dry weight = Analyte found (ppb) x [100% / total solids(%)]

An example of a calculation using an actual sample follows:

Soil sample Exygen ID C0081358 Spk D (Set: 080905A), fortified at 50000 ng/L with PFOA where:

peak area	=	1208128
intercept	=	91300
slope	=	2430
dilution factor	=	100
ng/L analyte added (fort level)	=	50000
amt in corresponding sample (ng/L)*	=	131
volume extracted (L)	=	0.04
sample weight (g)	=	5
total solids (%)	=	86.88

*The primary sample result was used for all calculations

From equation 1:

$$\text{Analyte found (ng/L)} = \frac{[1208128 - 91300] \times 100}{2430} = 45960 \text{ ng/L}$$

From equation 2:

$$\text{\% Recovery} = \frac{(45960 \text{ ng/L} - 131 \text{ ng/L}) \times 100\%}{50000 \text{ ng/L}} = 92\ \%$$

From equation 3:

$$\text{Analyte found (ppb)} = \frac{(45960 \text{ ng/L} \times 0.04 \text{ L})}{5 \text{ g}} = 368 \text{ ppb}$$

From equation 4:

Analyte found (ppb) dry weight = 368 ppb x (100% / 86.88%)

= 423 ppb

NOTE: This value may be slightly different than that of the raw data due to rounding.

7.0 EXPERIMENTAL DESIGN

^{13}C PFOA was used as a surrogate for all the samples except the rinse blanks. ^{13}C PFOA was added to the soil samples and sample replicates in the laboratory after collection. ^{13}C PFOA was added to the ground water sample collection bottles in the laboratory before being shipped to the field for sampling. For water samples designated as field matrix spikes, PFOA, PFBS, PFHS and PFOS were also added at a known concentration to the bottles in the laboratory before being shipped to the field. The water sample bottles were filled to a 200 mL volumetric fill line in the field.

The soil samples were extracted in forty-one sets, five of which contained re-extractions. Each set included one reagent blank and two reagent blanks fortified at known concentrations. The first thirty-five soil sets contained five samples each. The thirty-sixth soil set contained four samples. The thirty-seventh soil set contained re-extractions of four samples. The thirty-eighth soil set contained re-extractions for three samples. The thirty-ninth and fortieth soil sets each contained re-extractions for five samples. The forty-first soil set contained a re-extraction for one sample. For each sample, a laboratory duplicate of the sample and two laboratory matrix spikes were also extracted. The laboratory spikes were fortified with known concentrations of PFBS, PFHS, PFOS, PFOA and ^{13}C PFOA.

The ground water samples were extracted in four sets and the rinse blanks were extracted in one set. Each set included one reagent blank and two reagent blanks fortified at known concentrations. The rinse blank set contained samples from eight sample sites. The first ground water set contained three sample sites. The second ground water set contained one sample site and the decontamination water. The third ground water set contained three sample sites. The fourth ground water set contained two sample sites, along with a trip blank and trip blank spikes collected for the ground water samples. For each site, a sample, a field duplicate and two matrix field spikes were collected. For each site, a laboratory duplicate of the primary sample was extracted and two laboratory matrix spikes were also extracted. For the two laboratory matrix spikes, two 40 mL portions of the primary sample collected for the site was poured from the bottle and fortified. Not only were PFBS, PFHS, PFOS and PFOA added in the laboratory prior to extraction, but also ^{13}C PFOA was added. The additional ^{13}C PFOA was added because the levels of PFBS, PFHS, PFOS and PFOA spiked into the samples were known to exceed the calibration ranges and were not analyzed without dilution; therefore, ^{13}C PFOA levels were adjusted to require the same dilution as the other analytes.

8.0 RESULTS

Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in soil samples are summarized in **Table I**. Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in ground water samples are summarized in **Table II**. Analytical results for the analysis of PFOA, PFBS, PFHS, and PFOS in rinse blank samples are summarized in **Table III**.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the soil samples are detailed in **Tables IV and V**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the soil samples were 86 ± 17%, 84 ± 9%, 88 ± 10% and 85 ± 16%, respectively. Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the ground water samples are detailed in **Tables VI and VII**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the ground water samples were 98 ± 17%, 97 ± 10%, 103 ± 18% and 91 ± 17%, respectively.

Fortification recoveries for ^{13}C PFOA in the soil samples are detailed in **Table VIII**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the soil samples were 79 ± 12%. Fortification recoveries for ^{13}C PFOA in the ground water samples are detailed in **Table IX**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the ground water samples were 85 ± 30%. Fortification recoveries for ^{13}C PFOA in the rinse blank samples are detailed in **Table X**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the rinse blank samples were 78 ± 5%.

In cases where both the low and the high matrix spikes were not reportable due to high levels of endogenous analyte, the ^{13}C PFOA results were used to calculate assessed accuracy. It appears that an inverse correlation may exist between the recoveries of the ^{13}C PFOA and the measured level of PFOA in some samples. Careful assessments of the QC results were made to ensure that the data is of known quality and the analytical concentrations were not under-reported. Several of the analyzed soil samples were not reported due to quality control failure. The samples failed because the PFOA and ^{13}C PFOA surrogate spikes were too low relative to the endogenous level in the sample to allow assessment of matrix interference or because they failed the eligibility criteria for reporting (explained below).

The following approach was used for the assessment of the accuracy for the individual samples. First, the result of PFOA spikes, where the endogenous amount is not greater than three times the spiked amount, was evaluated. For samples where the endogenous analyte was measured at levels greater than three times the spike amount, the ^{13}C PFOA was evaluated. Most samples were fortified with ^{13}C PFOA at 4 ppb. The low and high spikes included ^{13}C PFOA at 40 ppb and 400 ppb respectively. Based on conversations with the Study Director and 3M laboratory management, the ^{13}C PFOA result was only used to assess accuracy for samples that had analyte concentrations below 400 ppb so that the ^{13}C PFOA concentration was at a minimum of 10% of the highest analyte concentration. Sample results over 400 ppb (wet weight) are not reported using QC data at the 40 ppb spike level.

9.0 CONCLUSIONS

The soil and ground water samples were successfully extracted and analyzed for PFOA, PFBS, PFHS and PFOS according to analytical methods V0001781 and V0001780, respectively. There were no circumstances that may have affected the data quality or integrity.

10.0 RETENTION OF DATA AND SAMPLES

All original paper data generated by Exygen Research that pertains to this interim report will be shipped to the study director. This does not include facility-specific raw data such as instrument or temperature logs. Exact copies of all raw data, as well as a signed copy of the interim analytical report and all original facility-specific raw data, will be retained in the Exygen Research archives for the period of time specified in EPA TSCA Good Laboratory Practice Standards 40 CFR 792.

TABLES

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)
C0081358	CGMN-SS-D101-0-0005	ND	30	ND	30	19.4	30	1.21	30
C0081358 Rep	CGMN-SS-D101-0-0005*	ND	30	ND	30	20.5	30	0.856	30
C0081359	CGMN-SS-D101-DB-0005	ND	30	ND	30	19.4	30	0.613	30
C0081359 Rep	CGMN-SS-D101-DB-0005*	ND	30	ND	30	21.0	30	NQ	30
C0081360	CGMN-SS-D201-0-0000	ND	30	1.57	30	62.8	40	4.51	30
C0081360 Rep	CGMN-SS-D201-0-0000*	ND	30	1.66	30	67.9	40	4.79	30
C0081361	CGMN-SS-D201-0-0005	ND	30	1.35	30	68.1	30	9.19	30
C0081361 Rep	CGMN-SS-D201-0-0005*	ND	30	0.828	30	68.7	30	9.17	30
C0081362	CGMN-SS-D202-0-0000	NQ	30	4.48	30	1140	50	23.8	30
C0081362 Rep	CGMN-SS-D202-0-0000*	NQ	30	5.06	30	1250	50	23.6	30
C0081363	CGMN-SS-D202-0-0005	ND	30	7.14	30	1590	30	56.5	30
C0081363 Rep	CGMN-SS-D202-0-0005*	NQ	30	6.21	30	1660	30	49.6	30
C0081374	CGMN-SS-D101-0-0000	ND	30	ND	30	12.7	30	3.99	30
C0081374 Rep	CGMN-SS-D101-0-0000*	ND	30	ND	30	15.3	30	5.33	30
C0081388	CGMN-SS-B1502-0-0000	1.34	40	0.451	30	18.0	30	8.35	30
C0081388 Rep	CGMN-SS-B1502-0-0000*	1.34	40	0.547	30	13.2	30	9.22	30
C0081389	CGMN-SS-B1502-0-0005	ND	50	ND	30	61.4	30	7.84	30
C0081389 Rep	CGMN-SS-B1502-0-0005*	ND	50	ND	30	62.0	30	7.69	30
C0081390	CGMN-SS-B1501-0-0000	6.40	30	NQ	30	13.2	30	18.4	30
C0081390 Rep	CGMN-SS-B1501-0-0000*	5.55	30	NQ	30	14.0	30	20.5	30
C0081391	CGMN-SS-B1501-0-0005	NQ	30	NQ	30	45.5	30	18.0	40
C0081391 Rep	CGMN-SS-B1501-0-0005*	NQ	30	NQ	30	48.4	30	19.8	40
C0081163	CGMN-SBC-D203-0-0000	1.02	30	35.3	30	3830	40	259	40
C0081163 Rep	CGMN-SBC-D203-0-0000*	0.84	30	30.0	30	4010	40	230	40
C0081164	CGMN-SBC-D203-0-0050	3.61	30	259	30	9560	60	1940	60
C0081164 Rep	CGMN-SBC-D203-0-0050*	4.52	30	368	30	9680	60	2330	60
C0081165	CGMN-SBC-D203-0-0100	6.10	30	361	30	7260	60	4650	60
C0081165 Rep	CGMN-SBC-D203-0-0100*	6.66	30	377	30	7360	60	5220	60
C0081166	CGMN-SBC-D203-0-0150	22.5	30	1660	50	11300	50	11600	50
C0081166 Rep	CGMN-SBC-D203-0-0150*	19.8	30	1420	50	9440	50	10200	50
C0081167	CGMN-SBC-D203-0-0200	18.2	30	936	30	10600	50	9100	50
C0081167 Rep	CGMN-SBC-D203-0-0200*	17.3	30	971	30	9240	50	8730	50
C0081168	CGMN-SBC-D203-0-0250	4.86	30	51.3	30	786	30	487	30
C0081168 Rep	CGMN-SBC-D203-0-0250*	4.96	30	49.2	30	730	30	444	30
C0081169	CGMN-SBC-D203-0-0300	6.67	30	61.0	30	49.6	40	613	50
C0081169 Rep	CGMN-SBC-D203-0-0300*	7.82	30	58.5	30	43.3	40	549	50
C0081170	CGMN-SBC-D203-DB-0300	11.2	30	38.8	30	44.9	30	322	30
C0081170 Rep	CGMN-SBC-D203-DB-0300*	7.48	30	55.6	30	42.5	30	525	30
C0081171	CGMN-SBC-D203-0-0350	1.84	30	75.0	30	12.7	30	655	30
C0081171 Rep	CGMN-SBC-D203-0-0350*	1.60	30	72.4	30	12.4	30	598	30
C0081172	CGMN-SBC-D203-0-0400	2.14	30	31.9	30	7.67	30	170	30
C0081172 Rep	CGMN-SBC-D203-0-0400*	2.28	30	31.9	30	11.0	30	167	30
C0081173	CGMN-SBC-D203-0-0450	4.56	30	25.4	30	19.7	30	62.8	30
C0081173 Rep	CGMN-SBC-D203-0-0450*	4.32	30	25.5	30	19.9	30	61.1	30
C0081174	CGMN-SBC-D202-0-0000	NQ	30	30.8	30	5410	30	283	60
C0081174 Rep	CGMN-SBC-D202-0-0000*	0.618	30	37.3	30	6860	30	361	60
C0081175	CGMN-SBC-D202-0-0050	3.79	30	288	30	6500	50	6620	30
C0081175 Rep	CGMN-SBC-D202-0-0050*	3.68	30	295	30	7090	50	5600	30

*Laboratory Duplicate

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Continued

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)
C0081176	CGMN-SBC-D202-0-0100	0.885	30	32.0	30	1500	30	570	30
C0081176 Rep	CGMN-SBC-D202-0-0100*	0.878	30	32.2	30	1490	30	578	30
C0081177	CGMN-SBC-D202-0-0150	2.92	30	178	30	12300	60	2950	30
C0081177 Rep	CGMN-SBC-D202-0-0150*	3.22	30	188	30	12600	60	2750	30
C0081178	CGMN-SBC-D202-0-0200	1.29	30	60.1	30	6660	50	618	60
C0081178 Rep	CGMN-SBC-D202-0-0200*	1.53	30	61.7	30	7490	50	762	60
C0081179	CGMN-SBC-D202-0-0250	1.17	30	20.2	30	775	30	246	30
C0081179 Rep	CGMN-SBC-D202-0-0250*	1.19	30	19.9	30	784	30	247	30
C0081180	CGMN-SBC-D202-0-0300	2.15	30	38.0	30	779	30	842	30
C0081180 Rep	CGMN-SBC-D202-0-0300*	2.35	30	38.9	30	808	30	863	30
C0081181	CGMN-SBC-D202-0-0350	2.73	30	28.8	30	61.6	50	454	30
C0081181 Rep	CGMN-SBC-D202-0-0350*	2.77	30	31.0	30	66.4	50	477	30
C0081182	CGMN-SBC-D202-DB-0350	3.32	30	34.4	30	60.4	30	543	50
C0081182 Rep	CGMN-SBC-D202-DB-0350*	4.07	30	33.2	30	62.8	30	489	50
C0081183	CGMN-SBC-D202-0-0400	2.69	30	87.3	40	198	30	968	30
C0081183 Rep	CGMN-SBC-D202-0-0400*	2.61	30	85.7	40	199	30	1010	30
C0081184	CGMN-SBC-D202-0-0450	9.89	30	117	30	104	30	1100	30
C0081184 Rep	CGMN-SBC-D202-0-0450*	10.3	30	122	30	107	30	1170	30
C0081185	CGMN-SBC-D201-0-0000	ND	30	3.06	30	711	50	32.7	60
C0081185 Rep	CGMN-SBC-D201-0-0000*	ND	30	2.89	30	737	50	32.3	60
C0081186	CGMN-SBC-D201-0-0050	NQ	30	29.4	30	2520	50	413	60
C0081186 Rep	CGMN-SBC-D201-0-0050*	NQ	30	22.9	30	2510	50	313	60
C0081187	CGMN-SBC-D201-0-0100	ND	30	4.89	30	238	30	49.5	30
C0081187 Rep	CGMN-SBC-D201-0-0100*	ND	30	5.31	30	270	30	56.0	30
C0081188	CGMN-SBC-D201-DB-0100	ND	30	5.33	30	286	30	56.8	40
C0081188 Rep	CGMN-SBC-D201-DB-0100*	ND	30	6.65	30	410	30	67.9	40
C0081189	CGMN-SBC-D201-0-0150	3.94	30	334	40	11500	50	5180	50
C0081189 Rep	CGMN-SBC-D201-0-0150*	3.04	30	292	40	12400	50	4810	50
C0081190	CGMN-SBC-D201-0-0200	1.50	30	50.0	30	2500	60	792	30
C0081190 Rep	CGMN-SBC-D201-0-0200*	1.47	30	47.2	20	1960	60	869	30
C0081191	CGMN-SBC-D201-0-0250	8.43	30	78.1	60	730	60	668	50
C0081191 Rep	CGMN-SBC-D201-0-0250*	3.90	30	63.3	60	613	60	619	50
C0081192	CGMN-SBC-D201-0-0300	1.97	30	59.6	30	343	30	613	30
C0081192 Rep	CGMN-SBC-D201-0-0300*	2.06	30	57.7	30	335	30	598	30
C0081193	CGMN-SBC-D201-0-0350	0.562	30	35.8	30	51.3	30	320	30
C0081193 Rep	CGMN-SBC-D201-0-0350*	0.637	30	38.4	30	46.7	30	310	30
C0081194	CGMN-SBC-D201-0-0400	0.963	30	37.4	30	4.40	30	239	30
C0081194 Rep	CGMN-SBC-D201-0-0400*	0.913	30	36.5	30	4.38	30	228	30
C0081195	CGMN-SBC-D104-0-0000	4.77	30	8.83	50	NR	NR	NR	NR
C0081195 Rep	CGMN-SBC-D104-0-0000*	4.84	30	7.60	50	NR	NR	NR	NR
C0081196	CGMN-SBC-D104-0-0050	ND	30	15.1	30	893	30	284	50
C0081196 Rep	CGMN-SBC-D104-0-0050*	ND	30	9.45	30	849	30	348	50
C0081197	CGMN-SBC-D104-DB-0050	ND	30	14.8	30	820	60	246	30
C0081197 Rep	CGMN-SBC-D104-DB-0050*	ND	30	9.40	30	582	60	262	30
C0081198	CGMN-SBC-D104-0-0100	ND	30	23.0	30	381	30	1380	60
C0081198 Rep	CGMN-SBC-D104-0-0100*	ND	30	24.1	30	374	30	1390	60
C0081199	CGMN-SBC-D104-0-0150	0.516	30	129	30	109	50	4520	60
C0081199 Rep	CGMN-SBC-D104-0-0150*	0.448	30	128	30	109	50	4520	60

*Laboratory Duplicate

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Continued

Exygen ID	Client Sample ID	C4 Sulfonate PFBS Analyte Found Dry Wt. (ppb, ng/g)	C4 Sulfonate PFBS Assessed Accuracy (+% / - %)	C6 Sulfonate PFHS Analyte Found Dry Wt. (ppb, ng/g)	C6 Sulfonate PFHS Assessed Accuracy (+% / - %)	C8 Sulfonate PFOS Analyte Found Dry Wt. (ppb, ng/g)	C8 Sulfonate PFOS Assessed Accuracy (+% / - %)	C8 Acid PFOA Analyte Found Dry Wt. (ppb, ng/g)	C8 Acid PFOA Assessed Accuracy (+% / - %)
C0081200	CGMN-SBC-D104-0-0200	NQ	30	61.7	30	73.1	30	2500	60
C0081200 Rep	CGMN-SBC-D104-0-0200*	0.574	30	54.5	30	64.1	30	2490	60
C0081201	CGMN-SBC-D104-0-0250	0.534	30	38.8	30	112	40	2060	60
C0081201 Rep	CGMN-SBC-D104-0-0250*	0.524	30	37.5	30	93.4	40	2000	60
C0081202	CGMN-SBC-D104-0-0300	0.590	30	32.8	30	282	30	361	30
C0081202 Rep	CGMN-SBC-D104-0-0300*	0.558	30	39.0	30	337	30	398	30
C0081203	CGMN-SBC-D104-0-0350	0.515	30	69.6	30	184	30	199	30
C0081203 Rep	CGMN-SBC-D104-0-0350*	0.507	30	58.1	30	161	30	185	30
C0081205	CGMN-SBC-D104-0-0400	NQ	30	38.1	30	125	30	62.2	30
C0081205 Rep	CGMN-SBC-D104-0-0400*	NQ	30	35.4	30	119	30	62.3	30
C0081206	CGMN-SBC-D104-0-0450	ND	30	23.5	30	120	30	185	30
C0081206 Rep	CGMN-SBC-D104-0-0450*	NQ	30	24.4	30	123	30	182	30
C0081207	CGMN-SBC-D104-DB-0450	NQ	30	26.3	30	128	30	190	30
C0081207 Rep	CGMN-SBC-D104-DB-0450*	NQ	30	23.7	30	118	30	183	30
C0081208	CGMN-SBC-D104-0-0500	NQ	30	8.06	30	90.2	40	371	30
C0081208 Rep	CGMN-SBC-D104-0-0500*	NQ	30	8.25	30	86.0	40	346	30
C0081209	CGMN-SBC-D104-0-0550	NQ	30	6.24	30	82.6	40	323	30
C0081209 Rep	CGMN-SBC-D104-0-0550*	NQ	30	5.87	30	79.6	40	313	30
C0081210	CGMN-SBC-D104-0-0600	ND	30	8.10	30	131	30	183	30
C0081210 Rep	CGMN-SBC-D104-0-0600*	ND	30	8.07	30	139	30	176	30
C0081211	CGMN-SBC-D104-0-0650	ND	30	3.61	30	134	30	144	30
C0081211 Rep	CGMN-SBC-D104-0-0650*	ND	30	3.62	30	131	30	142	30
C0081212	CGMN-SBC-D103-0-0000	ND	30	ND	30	83.3	30	13.6	40
C0081212 Rep	CGMN-SBC-D103-0-0000*	ND	30	ND	30	85.1	30	11.8	40
C0081213	CGMN-SBC-D103-0-0050	ND	30	0.780	30	913	30	181	30
C0081213 Rep	CGMN-SBC-D103-0-0050*	ND	30	0.604	30	675	30	143	30
C0081214	CGMN-SBC-D103-0-0100	ND	30	0.914	30	940	30	632	30
C0081214 Rep	CGMN-SBC-D103-0-0100*	ND	30	0.772	30	906	30	431	30
C0081215	CGMN-SBC-D103-0-0150	ND	30	2.78	30	229	30	2480	30
C0081215 Rep	CGMN-SBC-D103-0-0150*	ND	30	2.56	30	209	30	2190	30
C0081216	CGMN-SBC-D103-DB-0150	ND	30	2.81	30	229	30	2470	30
C0081216 Rep	CGMN-SBC-D103-DB-0150*	ND	30	2.72	30	225	30	2380	30
C0081217	CGMN-SBC-D103-0-0200	0.744	30	10.6	30	592	30	1450	30
C0081217 Rep	CGMN-SBC-D103-0-0200*	0.666	30	10.5	30	555	30	1570	30
C0081219	CGMN-SBC-D103-0-0250	1.42	30	12.8	30	380	30	NR	NR
C0081219 Rep	CGMN-SBC-D103-0-0250*	1.39	30	13.0	30	418	30	NR	NR
C0081220	CGMN-SBC-D103-0-0300	NQ	30	6.21	30	223	30	152	60
C0081220 Rep	CGMN-SBC-D103-0-0300*	NQ	30	6.84	30	229	30	155	60
C0081221	CGMN-SBC-D103-0-0350	0.570	30	13.9	30	338	30	64.0	40
C0081221 Rep	CGMN-SBC-D103-0-0350*	0.771	30	15.2	30	368	30	66.7	40
C0081222	CGMN-SBC-D103-0-0400	0.771	30	35.6	30	381	40	114	30
C0081222 Rep	CGMN-SBC-D103-0-0400*	0.775	30	34.2	30	346	40	102	30
C0081236	CGMN-SBC-D103-0-0450	NR	NR	8.78	30	197	30	84.6	30
C0081236 Rep	CGMN-SBC-D103-0-0450*	NR	NR	9.29	30	207	30	85.4	30
C0081238	CGMN-SBC-D103-0-0500	ND	30	4.09	30	178	30	55.5	30
C0081238 Rep	CGMN-SBC-D103-0-0500*	NQ	30	4.24	30	184	30	54.3	30
C0081239	CGMN-SBC-D103-0-0550	NQ	30	3.70	30	116	30	158	30
C0081239 Rep	CGMN-SBC-D103-0-0550*	NQ	30	3.97	30	121	30	166	30

*Laboratory Duplicate
ND = Not detected at or above 0.2 ng/g (wet weight).
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NR = Not reported due to quality control result failures.

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Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Continued

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)
C0081240	CGMN-SBC-D103-0-0600	ND	30	4.50	30	189	30	162	30
C0081240 Rep	CGMN-SBC-D103-0-0600*	ND	30	4.50	30	189	30	174	30
C0081241	CGMN-SBC-D103-0-0650	NQ	30	7.51	30	250	30	164	30
C0081241 Rep	CGMN-SBC-D103-0-0650*	NQ	30	8.28	30	267	30	177	30
C0081248	CGMN-SBC-D801-0-0000	0.573	30	2.81	30	583	60	159	30
C0081248 Rep	CGMN-SBC-D801-0-0000*	0.625	30	2.82	30	630	60	151	30
C0081249	CGMN-SBC-D801-0-0050	1.49	30	6.17	30	526	30	356	30
C0081249 Rep	CGMN-SBC-D801-0-0050*	4.22	30	4.56	30	467	30	313	30
C0081250	CGMN-SBC-D801-0-0100	1.74	30	5.74	30	567	50	470	50
C0081250 Rep	CGMN-SBC-D801-0-0100*	1.77	30	6.20	30	821	50	615	50
C0081251	CGMN-SBC-D801-0-0150	0.710	30	2.81	30	281	30	88.9	40
C0081251 Rep	CGMN-SBC-D801-0-0150*	0.769	30	2.71	30	346	30	95.8	40
C0081252	CGMN-SBC-D801-0-0200	1.19	30	4.76	30	394	30	204	30
C0081252 Rep	CGMN-SBC-D801-0-0200*	1.17	30	4.46	30	345	30	199	30
C0081274	CGMN-SBC-D101-0-0000	NQ	30	1.46	30	46.6	30	6.78	30
C0081274 Rep	CGMN-SBC-D101-0-0000*	NQ	30	1.50	30	45.6	30	5.00	30
C0081275	CGMN-SBC-D101-0-0050	5.92	30	7.13	30	45.4	30	57.9	30
C0081275 Rep	CGMN-SBC-D101-0-0050*	5.70	30	7.34	30	47.4	30	60.5	30
C0081277	CGMN-SBC-D101-0-0100	2.03	30	31.4	30	84.2	30	178	30
C0081277 Rep	CGMN-SBC-D101-0-0100*	1.97	30	31.9	30	64.6	30	184	30
C0081278	CGMN-SBC-D101-D8-0100	2.11	30	30.2	30	67.9	40	189	30
C0081278 Rep	CGMN-SBC-D101-D8-0100*	1.93	30	30.6	30	66.0	40	189	30
C0081279	CGMN-SBC-D101-0-0150	1.17	30	6.75	30	67.6	30	26.2	30
C0081279 Rep	CGMN-SBC-D101-0-0150*	1.20	30	6.82	30	67.6	30	25.5	30
C0081280	CGMN-SBC-D101-0-0200	0.809	30	3.70	30	36.1	30	19.3	30
C0081280 Rep	CGMN-SBC-D101-0-0200*	0.753	30	3.11	30	33.8	30	16.9	30
C0081281	CGMN-SBC-D102-0-0000	1.94	30	8.82	30	NR	NR	NR	NR
C00812061 Rep	CGMN-SBC-D102-0-0000*	2.04	30	7.78	30	NR	NR	NR	NR
C0081282	CGMN-SBC-D102-0-0050	2.83	30	35.0	30	391	30	772	30
C0081282 Rep	CGMN-SBC-D102-0-0050*	2.51	30	36.1	30	401	30	764	30
C0081283	CGMN-SBC-D102-0-0100	0.514	30	21.8	30	134	30	673	30
C0081283 Rep	CGMN-SBC-D102-0-0100*	0.451	30	21.5	30	133	30	651	30
C0081284	CGMN-SBC-D102-0-0150	NQ	30	6.20	30	34.7	30	117	40
C0081284 Rep	CGMN-SBC-D102-0-0150*	NQ	30	6.46	30	36.9	30	122	40
C0081285	CGMN-SBC-D102-0-0200	NQ	30	6.82	30	254	30	129	30
C0081285 Rep	CGMN-SBC-D102-0-0200*	NQ	30	7.30	30	250	30	138	30
C0081342	CGMN-SBC-B1501-0-0000	1.72	30	2.77	30	590	30	58.7	60
C0081342 Rep	CGMN-SBC-B1501-0-0000*	1.80	30	2.96	30	647	30	67.1	60
C0081343	CGMN-SBC-B1501-0-0050	1.62	30	2.86	30	170	30	173	30
C0081343 Rep	CGMN-SBC-B1501-0-0050*	1.46	30	2.67	30	162	30	158	30
C0081344	CGMN-SBC-B1501-0-0100	0.727	30	2.09	30	104	40	190	30
C0081344 Rep	CGMN-SBC-B1501-0-0100*	0.614	30	2.14	30	102	40	192	30
C0081345	CGMN-SBC-B1501-0-0150	0.484	30	0.832	30	NR	NR	89.3	30
C0081345 Rep	CGMN-SBC-B1501-0-0150*	0.465	30	0.764	30	NR	NR	88.3	30
C0081346	CGMN-SBC-B1501-0-0200	0.736	30	NQ	30	1840	30	80.9	50
C0081346 Rep	CGMN-SBC-B1501-0-0200*	1.00	30	NQ	30	1890	30	82.3	50
C0081242	CGMN-SBC-D501-0-0000	1.42	30	17.6	30	2340	30	NR	NR
C0081242 Rep	CGMN-SBC-D501-0-0000*	1.49	30	19.8	30	2280	30	NR	NR

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Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Continued

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / -%)
C0081243	CGMN-SBC-D501-0-0050	1.67	30	82.7	30	781	30	1350	60
C0081243 Rep	CGMN-SBC-D501-0-0050*	1.78	30	87.2	30	872	30	1400	60
C0081244	CGMN-SBC-D501-DB-0050	1.68	30	88.0	30	886	50	1290	60
C0081244 Rep	CGMN-SBC-D501-DB-0050*	1.58	30	81.1	30	793	50	1200	60
C0081245	CGMN-SBC-D501-0-0100	1.64	30	27.6	30	743	30	325	30
C0081245 Rep	CGMN-SBC-D501-0-0100*	1.30	30	23.8	30	642	30	288	30
C0081246	CGMN-SBC-D501-0-0150	ND	30	0.452	30	46.8	40	41.3	30
C0081246 Rep	CGMN-SBC-D501-0-0150*	ND	30	0.436	30	46.0	40	43.7	30
C0081247	CGMN-SBC-D501-0-0200	ND	30	0.743	30	28.1	30	20.3	30
C0081247 Rep	CGMN-SBC-D501-0-0200*	NQ	30	1.18	30	38.9	30	23.3	30
C0081253	CGMN-SBC-FTA02-0-0000	NQ	30	26.6	30	387	50	9.18	30
C0081253 Rep	CGMN-SBC-FTA02-0-0000*	ND	30	28.7	30	389	50	9.40	30
C0081254	CGMN-SBC-FTA02-0-0050	ND	30	8.11	30	46.4	30	2.08	30
C0081254 Rep	CGMN-SBC-FTA02-0-0050*	ND	30	8.62	30	51.0	30	2.16	30
C0081255	CGMN-SBC-FTA02-DB-0100	ND	30	6.61	30	11.4	30	1.91	30
C0081255 Rep	CGMN-SBC-FTA02-DB-0100*	ND	30	6.72	30	13.1	30	2.07	30
C0081256	CGMN-SBC-FTA02-0-0100	ND	30	6.31	30	12.5	30	1.84	30
C0081256 Rep	CGMN-SBC-FTA02-0-0100*	ND	30	6.43	30	13.0	30	1.83	30
C0081257	CGMN-SBC-FTA02-0-0150	ND	30	19.8	30	17.6	30	3.81	30
C0081257 Rep	CGMN-SBC-FTA02-0-0150*	ND	30	20.0	30	18.8	30	4.07	30
C0081258	CGMN-SBC-FTA02-0-0200	ND	30	21.1	30	15.8	30	5.09	30
C0081258 Rep	CGMN-SBC-FTA02-0-0200*	ND	30	23.2	30	16.3	30	5.18	30
C0081259	CGMN-SBC-FTA03-0-0000	24.7	30	331	30	902	40	440	30
C0081259 Rep	CGMN-SBC-FTA03-0-0000*	19.3	30	270	30	824	40	385	30
C0081260	CGMN-SBC-FTA03-0-0100	1.01	30	11.1	30	12.6	30	58.4	30
C0081260 Rep	CGMN-SBC-FTA03-0-0100*	1.11	30	10.1	30	11.9	30	55.2	30
C0081262	CGMN-SBC-FTA03-0-0100	NQ	30	2.03	30	1.51	30	16.0	30
C0081262 Rep	CGMN-SBC-FTA03-0-0100*	NQ	30	1.89	30	1.56	30	15.2	30
C0081263	CGMN-SBC-FTA03-0-0150	ND	30	0.698	30	1.24	30	4.81	30
C0081263 Rep	CGMN-SBC-FTA03-0-0150*	ND	30	0.806	30	1.40	30	5.62	30
C0081264	CGMN-SBC-FTA03-0-0200	0.994	30	7.42	30	1.59	30	142	30
C0081264 Rep	CGMN-SBC-FTA03-0-0200*	0.959	30	7.89	30	1.54	30	154	30
C0081269	CGMN-SBC-FTA01-0-0000	9.58	30	365	50	NR	NR	197	40
C0081269 Rep	CGMN-SBC-FTA01-0-0000*	10.4	30	376	50	NR	NR	224	40
C0081270	CGMN-SBC-FTA01-0-0050	2.06	30	99.1	40	75.6	30	45.2	30
C0081270 Rep	CGMN-SBC-FTA01-0-0050*	2.12	30	88.3	40	75.6	30	45.4	30
C0081271	CGMN-SBC-FTA01-0-0100	2.00	30	33.7	30	21.3	30	18.7	30
C0081271 Rep	CGMN-SBC-FTA01-0-0100*	2.10	30	33.4	30	22.1	30	17.2	30
C0081272	CGMN-SBC-FTA01-0-0150	1.43	30	50.8	50	23.2	30	34.5	30
C0081272 Rep	CGMN-SBC-FTA01-0-0150	1.52	30	57.9	50	26.5	30	38.4	30
C0081273	CGMN-SBC-FTA01-0-0200	1.80	30	196	30	53.8	50	NR	NR
C0081273 Rep	CGMN-SBC-FTA01-0-0200	1.70	30	197	30	51.8	50	NR	NR
C0081329	CGMN-SBC-WPA01-0-0000	NQ	30	NQ	30	129	40	32.5	40
C0081329 Rep	CGMN-SBC-WPA01-0-0000	NQ	30	NQ	30	133	40	31.8	40
C0081330	CGMN-SBC-WPA01-0-0050	ND	30	NQ	30	40.5	50	18.6	30
C0081330 Rep	CGMN-SBC-WPA01-0-0050	ND	30	NQ	30	44.6	50	19.9	30
C0081331	CGMN-SBC-WPA01-0-0100	ND	30	NQ	30	66.3	50	22.8	30
C0081331 Rep	CGMN-SBC-WPA01-0-0100	ND	30	NQ	30	49.7	50	20.0	30

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Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Continued

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)
C0081332	CGMN-SBC-WPA01-DB-0100	ND	30	NQ	30	50.7	30	14.8	30
C0081332 Rep	CGMN-SBC-WPA01-DB-0100*	ND	30	NQ	30	61.4	30	17.8	30
C0081333	CGMN-SBC-WPA01-0-0150	1.82	30	7.21	30	808	40	27.8	30
C0081333 Rep	CGMN-SBC-WPA01-0-0150*	1.88	30	5.83	30	804	40	27.8	30
C0081334	CGMN-SBC-WPA01-0-0200	6.18	30	NR	NR	NR	NR	NR	NR
C0081334 Rep	CGMN-SBC-WPA01-0-0200*	5.74	30	NR	NR	NR	NR	NR	NR
C0081335	CGMN-SBC-BKG01-0-0000	ND	60	ND	30	0.607	30	0.521	30
C0081335 Rep	CGMN-SBC-BKG01-0-0000*	ND	60	ND	30	0.616	30	0.569	30
C0081336	CGMN-SBC-BKG01-0-0050	ND	40	ND	30	NQ	30	0.765	30
C0081336 Rep	CGMN-SBC-BKG01-0-0050*	ND	40	ND	30	NQ	30	0.687	30
C0081338	CGMN-SBC-BKG01-0-0100	ND	30	ND	30	ND	30	0.529	30
C0081338 Rep	CGMN-SBC-BKG01-0-0100*	ND	30	ND	30	ND	30	0.500	30
C0081339	CGMN-SBC-BKG01-DB-0100	ND	30	ND	30	ND	30	0.678	30
C0081339 Rep	CGMN-SBC-BKG01-DB-0100*	ND	30	ND	30	ND	30	0.730	30
C0081340	CGMN-SBC-BKG01-0-0150	ND	30	ND	30	ND	30	NQ	30
C0081340 Rep	CGMN-SBC-BKG01-0-0150*	ND	30	ND	30	ND	30	NQ	30
C0081341	CGMN-SBC-BKG01-0-0200	ND	30	ND	30	NQ	30	0.913	30
C0081341 Rep	CGMN-SBC-BKG01-0-0200*	ND	30	ND	30	0.486	30	1.04	30
C0081347	CGMN-SBC-BKG02-0-0000	ND	30	ND	30	2.01	30	NQ	30
C0081347 Rep	CGMN-SBC-BKG02-0-0000*	ND	30	ND	30	1.87	30	NQ	30
C0081348	CGMN-SBC-BKG02-0-0050	ND	30	ND	30	NQ	30	NQ	30
C0081348 Rep	CGMN-SBC-BKG02-0-0050*	ND	30	ND	30	ND	30	NQ	30
C0081349	CGMN-SBC-BKG02-DB-0100	ND	30	ND	30	ND	30	NQ	30
C0081349 Rep	CGMN-SBC-BKG02-DB-0100*	ND	30	ND	30	ND	30	NQ	30
C0081350	CGMN-SBC-BKG02-0-0100	ND	30	ND	30	ND	30	NQ	30
C0081350 Rep	CGMN-SBC-BKG02-0-0100*	ND	30	ND	30	ND	30	NQ	30
C0081351	CGMN-SBC-BKG02-0-0150	ND	30	ND	30	ND	30	0.613	30
C0081351 Rep	CGMN-SBC-BKG02-0-0150*	ND	30	ND	30	ND	30	0.608	30
C0081352	CGMN-SBC-BKG02-0-0200	ND	40	ND	30	ND	30	0.941	30
C0081352 Rep	CGMN-SBC-BKG02-0-0200*	ND	40	ND	30	ND	30	0.975	30
C0081353	CGMN-SS-BKG01-0-0000	ND	30	ND	30	15.6	30	3.32	30
C0081353 Rep	CGMN-SS-BKG01-0-0000*	ND	30	ND	30	15.1	30	3.32	30
C0081354	CGMN-SS-BKG01-0-0005	ND	30	ND	30	4.08	30	3.38	30
C0081354 Rep	CGMN-SS-BKG01-0-0005*	ND	30	ND	30	6.15	30	3.43	30
C0081355	CGMN-SS-D801-0-0000	NQ	30	0.956	30	53.2	40	18.2	40
C0081355 Rep	CGMN-SS-D801-0-0000*	NQ	30	0.861	30	49.5	40	15.9	40
C0081356	CGMN-SS-D801-0-0005	ND	30	NQ	30	39.9	30	25.9	40
C0081356 Rep	CGMN-SS-D801-0-0005*	ND	30	NQ	30	41.7	30	28.4	40
C0081357	CGMN-SS-D801-DB-0005	ND	30	NQ	30	41.0	40	30.2	30
C0081357 Rep	CGMN-SS-D801-DB-0005*	ND	30	NQ	30	40.8	40	31.8	30
C0081365	CGMN-SS-B10201-0-0000	ND	30	0.469	30	29.3	40	1.99	30
C0081365 Rep	CGMN-SS-B10201-0-0000*	ND	30	NQ	30	25.4	40	1.86	30
C0081366	CGMN-SS-B10201-0-0005	ND	30	ND	30	77.4	40	1.35	30
C0081366 Rep	CGMN-SS-B10201-0-0005*	ND	30	NQ	30	74.6	40	1.44	30
C0081367	CGMN-SS-B2201-0-0000	NQ	30	ND	30	2.43	30	0.824	30
C0081367 Rep	CGMN-SS-B2201-0-0000*	NQ	30	ND	30	1.85	30	0.979	30
C0081368	CGMN-SS-B2201-0-0005	ND	30	ND	30	18.0	30	1.85	30
C0081368 Rep	CGMN-SS-B2201-0-0005*	ND	30	ND	30	16.4	30	2.18	30

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		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)
C0081369	CGMN-SS-B2201-DB-0005	ND	30	ND	30	17.2	30	1.98	30
C0081369 Rep	CGMN-SS-B2201-DB-0005*	ND	30	ND	30	17.9	30	2.10	30
C0081370	CGMN-SS-B2501-0-0000	0.910	30	1.60	30	512	30	54.9	30
C0081370 Rep	CGMN-SS-B2501-0-0000*	0.858	30	1.44	30	486	30	61.4	30
C0081371	CGMN-SS-B2501-0-0005	ND	30	2.53	30	97.9	30	39.8	30
C0081371 Rep	CGMN-SS-B2501-0-0005*	ND	30	2.17	30	104	30	37.7	30
C0081372	CGMN-SS-B2601-0-0000	1.10	30	1.18	30	71.5	30	10.9	30
C0081372 Rep	CGMN-SS-B2601-0-0000*	1.38	30	1.22	30	82.3	30	15.7	30
C0081373	CGMN-SS-B2601-0-0005	NQ	30	2.59	30	463	30	19.5	30
C0081373 Rep	CGMN-SS-B2601-0-0005*	NQ	30	2.08	30	372	30	16.7	30
C0081375	CGMN-SS-B1602-0-0000	2.71	38	1.81	30	165	30	5.00	30
C0081375 Rep	CGMN-SS-B1602-0-0000*	2.68	30	1.61	30	149	30	5.10	30
C0081376	CGMN-SS-B1602-0-0005	0.783	30	6.02	30	262	30	78.1	30
C0081376 Rep	CGMN-SS-B1602-0-0005*	0.753	30	5.51	30	264	30	73.6	30
C0081377	CGMN-SS-B11201-0-0000	NQ	30	1.02	30	83.0	40	7.74	30
C0081377 Rep	CGMN-SS-B11201-0-0000*	NQ	30	0.994	30	82.8	40	7.51	30
C0081378	CGMN-SS-B11201-0-0005	ND	30	NQ	30	14.4	30	3.10	30
C0081378 Rep	CGMN-SS-B11201-0-0005*	ND	30	NQ	30	12.3	30	3.21	30
C0081379	CGMN-SS-FTA01-0-0000	ND	30	6.27	30	42.4	40	4.33	30
C0081379 Rep	CGMN-SS-FTA01-0-0000*	ND	30	5.28	30	42.8	40	4.44	30
C0081380	CGMN-SS-FTA01-0-0005	ND	40	1.55	30	35.0	30	2.46	30
C0081380 Rep	CGMN-SS-FTA01-0-0005*	ND	40	1.81	30	40.3	30	2.90	30
C0081381	CGMN-SS-FTA01-DB-0005	ND	40	1.75	30	34.0	30	2.58	30
C0081381 Rep	CGMN-SS-FTA01-DB-0005*	ND	40	1.90	30	35.0	30	2.88	30
C0081382	CGMN-SS-FTA02-0-0000	4.76	30	295	40	1920	40	92.4	30
C0081382 Rep	CGMN-SS-FTA02-0-0000*	4.81	30	286	40	1720	40	85.7	30
C0081383	CGMN-SS-FTA02-0-0005	1.76	30	40.8	30	448	40	24.4	30
C0081383 Rep	CGMN-SS-FTA02-0-0005*	1.43	30	38.6	30	461	40	18.0	30
C0081385	CGMN-SS-B6801-0-0000	6.48	30	15.7	30	952	30	179	30
C0081385 Rep	CGMN-SS-B6801-0-0000*	4.52	30	11.6	30	713	30	122	30
C0081386	CGMN-SS-B6801-DB-0000	4.78	30	13.8	30	859	30	144	30
C0081386 Rep	CGMN-SS-B6801-DB-0000*	4.98	30	19.0	30	962	30	183	30
C0081387	CGMN-SS-B6801-0-0005	1.88	30	5.99	30	580	30	22.6	30
C0081387 Rep	CGMN-SS-B6801-0-0005*	2.32	30	6.64	30	534	30	32.9	30
C0081392	CGMN-SS-B1601-0-0000	3.82	60	ND	30	2.61	30	1.65	30
C0081392 Rep	CGMN-SS-B1601-0-0000*	4.06	60	ND	30	2.78	30	1.78	30
C0081393	CGMN-SS-B1601-0-0005	10.7	30	0.728	30	195	30	11.8	30
C0081393 Rep	CGMN-SS-B1601-0-0005*	12.8	30	0.788	30	178	30	13.4	30
C0081395	CGMN-SS-IC04-0-0000	ND	30	ND	30	6.20	30	1.27	30
C0081395 Rep	CGMN-SS-IC04-0-0000*	ND	30	ND	30	5.81	30	1.18	30
C0081396	CGMN-SS-IC04-0-0005	ND	30	ND	30	21.6	30	2.22	30
C0081396 Rep	CGMN-SS-IC04-0-0005*	ND	30	ND	30	18.4	30	2.19	30
C0081397	CGMN-SS-IC03-0-0000	ND	30	ND	30	1.31	30	1.85	30
C0081397 Rep	CGMN-SS-IC03-0-0000*	ND	30	ND	30	1.07	30	1.17	30
C0081398	CGMN-SS-IC03-0-0005	ND	30	ND	30	1.53	30	5.18	30
C0081398 Rep	CGMN-SS-IC03-0-0005*	ND	30	ND	30	1.40	30	5.64	30
C0081399	CGMN-SS-IC01-0-0000	ND	30	1.06	30	31.4	30	1.28	30
C0081399 Rep	CGMN-SS-IC01-0-0000*	ND	30	0.728	30	23.9	30	1.18	30

*Laboratory Duplicate

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Soil Samples Continued

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Wt. (ppb, ng/g)	Assessed Accuracy (+% / - %)
C0081400	CGMN-SS-IC01-0-0005	ND	30	1.57	30	51.3	40	2.10	30
C0081400 Rep	CGMN-SS-IC01-0-0005*	ND	30	1.23	30	39.0	40	1.80	30
C0081401	CGMN-SS-IC02-0-0000	ND	30	ND	30	9.41	30	1.94	30
C0081401 Rep	CGMN-SS-IC02-0-0000*	ND	30	NQ	30	9.56	30	2.02	30
C0081402	CGMN-SS-IC02-0-0005	ND	30	ND	30	8.52	30	0.875	30
C0081402 Rep	CGMN-SS-IC02-0-0005*	ND	30	ND	30	8.11	30	0.873	30
C0081403	CGMN-SS-D503-0-0000	ND	30	1.20	30	49.3	30	10.8	30
C0081403 Rep	CGMN-SS-D503-0-0000*	ND	30	1.08	30	48.4	30	11.5	30
C0081404	CGMN-SS-D503-0-0005	ND	30	NQ	30	18.9	30	2.00	30
C0081404 Rep	CGMN-SS-D503-0-0005*	ND	30	NQ	30	22.5	30	3.02	30
C0081405	CGMN-SS-D501-0-0000	NQ	30	1.30	30	136	40	10.8	30
C0081405 Rep	CGMN-SS-D501-0-0000*	NQ	30	2.04	30	157	40	11.8	30
C0081406	CGMN-SS-D501-0-0005	0.737	30	1.32	30	82.8	30	7.06	30
C0081406 Rep	CGMN-SS-D501-0-0005*	0.510	30	1.36	30	88.7	30	8.42	30
C0081407	CGMN-SS-B801-0-0000	ND	30	0.924	30	541	30	8.29	30
C0081407 Rep	CGMN-SS-B801-0-0000*	ND	30	0.851	30	509	30	7.31	30
C0081408	CGMN-SS-B801-0-0005	ND	30	1.28	30	1070	60	42.7	50
C0081408 Rep	CGMN-SS-B801-0-0005*	ND	30	1.25	30	896	60	34.0	50
C0081409	CGMN-SS-D502-0-0000	ND	30	0.717	30	72.7	30	4.60	30
C0081409 Rep	CGMN-SS-D502-0-0000*	ND	30	0.886	30	103	30	4.25	30
C0081410	CGMN-SS-D502-0-0005	ND	30	7.52	30	444	30	13.8	30
C0081410 Rep	CGMN-SS-D502-0-0005*	NQ	30	8.72	30	383	30	12.6	30

*Laboratory Duplicate

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Table II. Summary of PFBS, PFHS, PFOS and PFOA in Ground Water Samples

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)	Analyte Found (ppt, ng/L)	Assessed Accuracy (+% / - %)
C0061224	CGMN-GW-PW7-0-050516	ND	30	ND	30	ND	30	332	30
C0061224 Rep	CGMN-GW-PW7-0-050516*	ND	30	ND	30	ND	30	277	30
C0061225	CGMN-GW-PW7-DP-050516	ND	30	ND	30	ND	30	341	30
C0061228	CGMN-GW-MW8-0-050516	60.2	30	186	30	593	30	959	30
C0061228 Rep	CGMN-GW-MW8-0-050516*	53.2	30	167	30	454	30	766	30
C0061229	CGMN-GW-MW8-DP-050516	NQ	30	171	30	689	30	902	30
C0061232	CGMN-GW-MW19-0-050517	NR	NR	NR	NR	69.7	50	NR	NR
C0061232 Rep	CGMN-GW-MW19-0-050517*	NR	NR	NR	NR	NQ	50	NR	NR
C0061233	CGMN-GW-MW19-DP-050517	NR	NR	NR	NR	NQ	50	NR	NR
C0061265	CGMN-GW-DECON-0-050524	ND	30	ND	30	ND	30	ND	30
C0061265 Rep	CGMN-GW-DECON-0-050524*	ND	30	ND	30	ND	30	ND	30
C0061266	CGMN-GW-DECON-DP-050524	ND	30	ND	30	ND	30	ND	30
C0081411	WBMN-GW-R1-0-050512	1880	30	2070	40	56.9	30	2090	40
C0081411 Rep	WBMN-GW-R1-0-050512*	1980	30	2510	40	53.5	30	2370	40
C0081412	WBMN-GW-R1-DP-050512	1880	30	2340	40	58.3	30	2310	40
C0081416	WBMN-GW-R2-0-050512	ND	30	ND	30	ND	30	ND	30
C0081416 Rep	WBMN-GW-R2-0-050512*	ND	30	ND	30	ND	30	ND	30
C0081417	WBMN-GW-R2-DP-050512	ND	30	ND	30	ND	30	ND	30
C0081420	WBMN-GW-R3-0-050512	356	30	1040	30	91.4	30	159	30
C0081420 Rep	WBMN-GW-R3-0-050512*	325	30	1010	30	87.0	30	161	30
C0081421	WBMN-GW-R3-DP-050512	331	30	1040	30	106	30	166	30
C0081424	WBMN-GW-R4-0-050512	5410	30	22100	30	1880	30	2580	30
C0081424 Rep	WBMN-GW-R4-0-050512*	6510	30	22800	30	1780	30	2960	30
C0081425	WBMN-GW-R4-DP-050512	5230	30	25100	30	2060	30	2630	30
C0081428	WBMN-GW-CWM-0-050512	3640	30	16200	30	957	30	1940	30
C0081248 Rep	WBMN-GW-CWM-0-050512*	3450	30	9930	30	770	30	1890	30
C0081429	WBMN-GW-CWM-DP-050512	3690	30	10900	30	1020	30	2140	30
C0081432	WBMN-GW-CWD01-0-050512	3380	30	7420	40	1220	50	3080	40
C0081432 Rep	WBMN-GW-CWD01-0-050512*	3380	30	7290	40	1120	50	2970	40
C0081433	WBMN-GW-CWD01-DP-050512	3400	30	8670	40	1790	50	3640	40
C0081438	WBMN-GW-TRIP-0-050511	ND	30	ND	30	ND	30	ND	30

*Laboratory Duplicate

ND = Not detected at or above 25 ng/L.

NQ = Not quantifiable = Measured concentration between 25 ng/L and the Limit of Quantitation (LOQ) which is 50 ng/L.

NR = Not reported due to quality control result failures.

Table III. Summary of PFBS, PFHS, PFOS and PFOA in Rinse Blank Samples

		Analyte Found (ppt, ng/L)			
Exygen ID	Client Sample ID	C4 Sulfonate PFBS	C6 Sulfonate PFHS	C8 Sulfonate PFOS	C8 Acid PFOA
C0081204	CGMN-SBC-D104-RB-0400	ND	ND	ND	ND
C0081218	CGMN-SBC-D103-RB-0250	ND	ND	ND	ND
C0061237	CGMN-SBC-D103-RB-0500	ND	ND	ND	ND
C0081337	CGMN-SBC-DBKG01-RB-0200	ND	ND	ND	ND
C0061364	CGMN-SS-D101-RB-0005	ND	ND	ND	ND
C0081384	CGMN-SS-FTA01-RB-0005	ND	ND	ND	ND
C0061394	CGMN-SS-B6801-RB-0000	ND	ND	ND	ND
C0061261	CGMN-SBC-FTA03-RB-0100	ND	ND	ND	ND
C0081276	CGMN-SBC-D101-RB-01500	ND	ND	ND	ND

ND = Not detected at or above 25 ng/L.
NQ = Not quantifiable = Measured concentration between 25 ng/L and the Limit of Quantitation (LOQ) which is 50 ng/L.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-D101-0-0005 (C0081358 Spk C, 40 ng/L Lab Spike)	40	ND	35.8	90	40	ND	37.7	94
CGMN-SS-D101-0-0005 (C0081358 Spk D, 400 ng/L Lab Spike)	400	ND	334	84	400	ND	354	89
CGMN-SS-D101-DB-0005 (C0081359 Spk E, 40 ng/L Lab Spike)	40	ND	36.8	92	40	ND	38.2	96
CGMN-SS-D101-DB-0005 (C0081359 Spk F, 400 ng/L Lab Spike)	400	ND	348	87	400	ND	354	89
CGMN-SS-D201-0-0000 (C0081360 Spk G, 40 ng/L Lab Spike)	40	ND	29.9	75	40	1.18	37.4	94
CGMN-SS-D201-0-0000 (C0081360 Spk H, 400 ng/L Lab Spike)	400	ND	281	70	400	1.18	343	86
CGMN-SS-D201-0-0005 (C0081361 Spk I, 40 ng/L Lab Spike)	40	ND	34.7	87	40	1.02	35.8	90
CGMN-SS-D201-0-0005 (C0081361 Spk J, 400 ng/L Lab Spike)	400	ND	317	79	400	1.02	334	84
CGMN-SS-D202-0-0000 (C0081362 Spk K, 40 ng/L Lab Spike)	40	NQ	37.5	94	40	3.87	42.8	97
CGMN-SS-D202-0-0000 (C0081362 Spk L, 400 ng/L Lab Spike)	400	NQ	330	83	400	3.87	334	83
CGMN-SS-D202-0-0005 (C0081363 Spk C, 40 ng/L Lab Spike)	40	ND	37.7	94	40	6.48	42.3	90
CGMN-SS-D202-0-0005 (C0081363 Spk D, 400 ng/L Lab Spike)	400	ND	354	89	400	6.48	338	83
CGMN-SS-D101-0-0000 (C0081374 Spk E, 40 ng/L Lab Spike)	40	ND	34.2	86	40	ND	35.1	88
CGMN-SS-D101-0-0000 (C0081374 Spk F, 400 ng/L Lab Spike)	400	ND	302	76	400	ND	307	77
CGMN-SS-B1502-0-0000 (C0081388 Spk G, 40 ng/L Lab Spike)	40	1.22	26.2	62	40	0.410	37.0	91
CGMN-SS-B1502-0-0000 (C0081388 Spk H, 400 ng/L Lab Spike)	400	1.22	259	64	400	0.410	336	84
CGMN-SS-B1502-0-0005 (C0081389 Spk I, 40 ng/L Lab Spike)	40	ND	23.0	58	40	ND	35.6	89
CGMN-SS-B1502-0-0005 (C0081389 Spk J, 400 ng/L Lab Spike)	400	ND	212	53	400	ND	312	78
CGMN-SS-B1501-0-0000 (C0081390 Spk K, 40 ng/L Lab Spike)	40	5.97	40.0	85	40	NQ	35.3	88
CGMN-SS-B1501-0-0000 (C0081390 Spk L, 400 ng/L Lab Spike)	400	5.97	288	71	400	NQ	298	75

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-B1501-0-0005 (C0001301 Spk C, 40 ng/L Lab Spike)	40	NQ	30.3	76	40	NQ	33.8	85
CGMN-SS-B1501-0-0005 (C0001301 Spk D, 400 ng/L Lab Spike)	400	NQ	302	76	400	NQ	345	86
CGMN-SBC-D203-0-0000 (C0001163 Spk E, 40 ng/L Lab Spike)	40	0.832	38.9	95	40	28.8	59.4	77
CGMN-SBC-D203-0-0000 (C0001163 Spk F, 400 ng/L Lab Spike)	400	0.832	328	82	400	28.8	351	81
CGMN-SBC-D203-0-0050 (C0001164 Spk G, 40 ng/L Lab Spike)	40	2.66	37.3	87	40	181	285	*
CGMN-SBC-D203-0-0050 (C0001164 Spk H, 400 ng/L Lab Spike)	400	2.66	338	84	400	181	564	93
CGMN-SBC-D203-0-0100 (C0001165 Spk I, 40 ng/L Lab Spike)	40	4.94	39.9	87	40	220	234	*
CGMN-SBC-D203-0-0100 (C0001165 Spk J, 400 ng/L Lab Spike)	400	4.94	335	83	400	220	522	76
CGMN-SBC-D203-0-0150 (C0001166 Spk K, 40 ng/L Lab Spike)	40	9.38	45.0	89	40	698	467	*
CGMN-SBC-D203-0-0150 (C0001166 Spk L, 400 ng/L Lab Spike)	400	9.38	390	97	400	698	928	58
CGMN-SBC-D203-0-0200 (C0001167 Spk C, 40 ng/L Lab Spike)	40	9.38	43.3	85	40	480	517	*
CGMN-SBC-D203-0-0200 (C0001167 Spk D, 400 ng/L Lab Spike)	400	9.38	330	80	400	480	848	92
CGMN-SBC-D203-0-0250 (C0001168 Spk E, 40 ng/L Lab Spike)	40	4.47	37.2	82	40	47.3	79.8	81
CGMN-SBC-D203-0-0250 (C0001168 Spk F, 400 ng/L Lab Spike)	400	4.47	352	87	400	47.3	392	86
CGMN-SBC-D203-0-0300 (C0001169 Spk G, 40 ng/L Lab Spike)	40	6.17	42.2	90	40	56.4	87.2	77
CGMN-SBC-D203-0-0300 (C0001169 Spk H, 400 ng/L Lab Spike)	400	6.17	340	83	400	56.4	401	86
CGMN-SBC-D203-DB-0300 (C0001170 Spk I, 40 ng/L Lab Spike)	40	10.2	43.6	84	40	35.4	86.4	128
CGMN-SBC-D203-DB-0300 (C0001170 Spk J, 400 ng/L Lab Spike)	400	10.2	366	89	400	35.4	386	87
CGMN-SBC-D203-0-0350 (C0001171 Spk K, 40 ng/L Lab Spike)	40	1.60	34.4	82	40	73.0	108	83
CGMN-SBC-D203-0-0350 (C0001171 Spk L, 400 ng/L Lab Spike)	400	1.60	334	83	400	73.0	426	88

*Sample residue exceeds the spiking level significantly (5x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found in Sample (ng/g)	C4 Sulfonate PFBS Amount Recovered (ng/g)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	C6 Sulfonate PFHS Amt Found in Sample (ng/g)	C6 Sulfonate PFHS Amount Recovered (ng/g)	C6 Sulfonate PFHS Recovery (%)
CGMN-SBC-D203-0-0400 (C0081172 Spk C, 40 ng/L Lab Spike)	40	2.10	36.9	87	40	31.3	64.4	83
CGMN-SBC-D203-0-0400 (C0081172 Spk D, 400 ng/L Lab Spike)	400	2.10	336	83	400	31.3	384	88
CGMN-SBC-D203-0-0450 (C0081173 Spk E, 40 ng/L Lab Spike)	40	4.43	35.0	76	40	24.7	53.3	72
CGMN-SBC-D203-0-0450 (C0081173 Spk F, 400 ng/L Lab Spike)	400	4.43	337	83	400	24.7	386	90
CGMN-SBC-D202-0-0000 (C0081174 Spk G, 40 ng/L Lab Spike)	40	NQ	35.4	88	40	22.3	54.8	81
CGMN-SBC-D202-0-0000 (C0081174 Spk H, 400 ng/L Lab Spike)	400	NQ	309	77	400	22.3	314	73
CGMN-SBC-D202-0-0050 (C0081175 Spk I, 40 ng/L Lab Spike)	40	1.98	40.0	95	40	150	187	93
CGMN-SBC-D202-0-0050 (C0081175 Spk J, 400 ng/L Lab Spike)	400	1.98	317	79	400	150	456	76
CGMN-SBC-D202-0-0100 (C0081176 Spk K, 40 ng/L Lab Spike)	40	0.521	34.2	84	40	26.0	66.7	102
CGMN-SBC-D202-0-0100 (C0081176 Spk L, 400 ng/L Lab Spike)	400	0.521	343	86	400	26.0	357	83
CGMN-SBC-D202-0-0150 (C0081177 Spk C, 40 ng/L Lab Spike)	40	1.56	36.4	87	40	96.8	131	86
CGMN-SBC-D202-0-0150 (C0081177 Spk D, 400 ng/L Lab Spike)	400	1.56	302	76	400	96.8	405	77
CGMN-SBC-D202-0-0200 (C0081178 Spk E, 40 ng/L Lab Spike)	40	1.02	38.7	94	40	39.8	79.5	99
CGMN-SBC-D202-0-0200 (C0081178 Spk F, 400 ng/L Lab Spike)	400	1.02	342	85	400	39.8	367	82
CGMN-SBC-D202-0-0250 (C0081179 Spk G, 40 ng/L Lab Spike)	40	1.06	39.8	97	40	18.4	55.4	93
CGMN-SBC-D202-0-0250 (C0081179 Spk H, 400 ng/L Lab Spike)	400	1.06	351	87	400	18.4	362	86
CGMN-SBC-D202-0-0300 (C0081180 Spk I, 40 ng/L Lab Spike)	40	2.03	38.8	92	40	34.1	72.7	97
CGMN-SBC-D202-0-0300 (C0081180 Spk J, 400 ng/L Lab Spike)	400	2.03	348	86	400	34.1	382	87
CGMN-SBC-D202-0-0350 (C0081181 Spk K, 40 ng/L Lab Spike)	40	2.60	39.0	91	40	28.2	59.5	78
CGMN-SBC-D202-0-0350 (C0081181 Spk L, 400 ng/L Lab Spike)	400	2.60	347	86	400	28.2	374	86

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D202-DB-0350 (C0081182 Spk C, 40 ng/L Lab Spike)	40	3.14	40.2	93	40	32.8	68.4	90
CGMN-SBC-D202-DB-0350 (C0081182 Spk D, 400 ng/L Lab Spike)	400	3.14	349	86	400	32.8	370	84
CGMN-SBC-D202-0-0400 (C0081183 Spk E, 40 ng/L Lab Spike)	40	2.62	36.7	85	40	84.8	111	66
CGMN-SBC-D202-0-0400 (C0081183 Spk F, 400 ng/L Lab Spike)	400	2.62	361	90	400	84.8	429	86
CGMN-SBC-D202-0-0450 (C0081184 Spk G, 40 ng/L Lab Spike)	40	9.12	43.5	86	40	108	148	100
CGMN-SBC-D202-0-0450 (C0081184 Spk H, 400 ng/L Lab Spike)	400	9.12	367	89	400	108	452	86
CGMN-SBC-D201-0-0000 (C0081185 Spk I, 40 ng/L Lab Spike)	40	ND	33.8	85	40	2.77	37.2	86
CGMN-SBC-D201-0-0000 (C0081185 Spk J, 400 ng/L Lab Spike)	400	ND	329	82	400	2.77	318	79
CGMN-SBC-D201-0-0050 (C0081186 Spk K, 40 ng/L Lab Spike)	40	NQ	33.0	83	40	25.5	53.4	70
CGMN-SBC-D201-0-0050 (C0081186 Spk L, 400 ng/L Lab Spike)	400	NQ	331	83	400	25.5	347	80
CGMN-SBC-D201-0-0100 (C0081187 Spk C, 40 ng/L Lab Spike)	40	ND	35.8	90	40	4.46	42.6	96
CGMN-SBC-D201-0-0100 (C0081187 Spk D, 400 ng/L Lab Spike)	400	ND	367	92	400	4.45	376	93
CGMN-SBC-D201-DB-0100 (C0081188 Spk E, 40 ng/L Lab Spike)	40	ND	36.4	91	40	4.82	40.2	88
CGMN-SBC-D201-DB-0100 (C0081188 Spk F, 400 ng/L Lab Spike)	400	ND	366	92	400	4.42	355	88
CGMN-SBC-D201-0-0150 (C0081189 Spk G, 40 ng/L Lab Spike)	40	2.21	34.7	81	40	167	207	*
CGMN-SBC-D201-0-0150 (C0081189 Spk H, 400 ng/L Lab Spike)	400	2.21	358	89	400	167	456	67
CGMN-SBC-D201-0-0200 (C0081190 Spk I, 40 ng/L Lab Spike)	40	1.28	39.4	95	40	42.7	71.4	72
CGMN-SBC-D201-0-0200 (C0081190 Spk J, 400 ng/L Lab Spike)	400	1.28	356	89	400	42.7	387	86
CGMN-SBC-D201-0-0250 (C0081191 Spk K, 40 ng/L Lab Spike)	40	4.73	36.8	80	40	65.4	80.8	39
CGMN-SBC-D201-0-0250 (C0081191 Spk L, 400 ng/L Lab Spike)	400	4.73	324	80	400	65.4	394	82

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D201-0-0300 (C0081192 Spk C, 40 ng/L Lab Spike)	40	1.83	39.4	94	40	55.4	89.6	88
CGMN-SBC-D201-0-0300 (C0081192 Spk D, 400 ng/L Lab Spike)	400	1.53	350	87	400	55.4	411	89
CGMN-SBC-D201-0-0350 (C0081193 Spk E, 40 ng/L Lab Spike)	40	0.546	39.0	96	40	34.8	71	91
CGMN-SBC-D201-0-0350 (C0081193 Spk F, 400 ng/L Lab Spike)	400	0.546	377	94	400	34.8	394	90
CGMN-SBC-D201-0-0400 (C0081194 Spk G, 40 ng/L Lab Spike)	40	0.968	37.8	92	40	38.8	74.6	95
CGMN-SBC-D201-0-0400 (C0081194 Spk H, 400 ng/L Lab Spike)	400	0.968	345	86	400	38.8	390	88
CGMN-SBC-D104-0-0000 (C0081195 Spk I, 40 ng/L Lab Spike)	40	4.00	49.0	113	40	7.24	80.7	152
CGMN-SBC-D104-0-0000 (C0081195 Spk J, 400 ng/L Lab Spike)	400	4.00	329.0	81	400	7.24	399	100
CGMN-SBC-D104-0-0050 (C0081196 Spk K, 40 ng/L Lab Spike)	40	ND	33.0	83	40	12.6	58.9	111
CGMN-SBC-D104-0-0050 (C0081196 Spk L, 400 ng/L Lab Spike)	400	ND	325	81	400	12.6	327	79
CGMN-SBC-D104-DB-0050 (C0081197 Spk C, 40 ng/L Lab Spike)	40	ND	35.4	89	40	12.4	49.6	93
CGMN-SBC-D104-DB-0050 (C0081197 Spk D, 400 ng/L Lab Spike)	400	ND	339	85	400	12.4	353	86
CGMN-SBC-D104-0-0100 (C0081198 Spk E, 40 ng/L Lab Spike)	40	ND	36.0	90	40	21.9	62.3	101
CGMN-SBC-D104-0-0100 (C0081198 Spk F, 400 ng/L Lab Spike)	400	ND	354	89	400	21.9	397	94
CGMN-SBC-D104-0-0150 (C0081199 Spk G, 40 ng/L Lab Spike)	40	0.471	43.8	106	40	118	170	130
CGMN-SBC-D104-0-0150 (C0081199 Spk H, 400 ng/L Lab Spike)	400	0.471	356	89	400	118	459	85
CGMN-SBC-D104-0-0200 (C0081200 Spk I, 40 ng/L Lab Spike)	40	NQ	35.2	84	40	51.2	84.0	82
CGMN-SBC-D104-0-0200 (C0081200 Spk J, 400 ng/L Lab Spike)	400	NQ	342	86	400	51.2	402	88
CGMN-SBC-D104-0-0250 (C0081201 Spk K, 40 ng/L Lab Spike)	40	0.534	35.3	87	40	32.7	89.4	92
CGMN-SBC-D104-0-0250 (C0081201 Spk L, 400 ng/L Lab Spike)	400	0.534	334	83	400	32.7	382	82

*Sample residue exceeds the spiking level significantly (5x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found In Sample (ng/g)	C4 Sulfonate PFBS Amount Recovered (ng/g)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	C6 Sulfonate PFHS Amt Found In Sample (ng/g)	C6 Sulfonate PFHS Amount Recovered (ng/g)	C6 Sulfonate PFHS Recovery (%)
CGMN-SBC-D104-0-0300 (C0081202 Spk C, 40 ng/L Lab Spike)	40	0.576	32.7	80	40	31.8	70.9	98
CGMN-SBC-D104-0-0300 (C0081202 Spk D, 400 ng/L Lab Spike)	400	0.575	330	82	400	31.8	405	93
CGMN-SBC-D104-0-0350 (C0081203 Spk E, 40 ng/L Lab Spike)	40	0.784	32.1	78	40	66.9	104	93
CGMN-SBC-D104-0-0350 (C0081203 Spk F, 400 ng/L Lab Spike)	400	0.784	316	79	400	66.9	420	88
CGMN-SBC-D104-0-0400 (C0081205 Spk G, 40 ng/L Lab Spike)	40	NQ	31.9	80	40	35.4	66.2	77
CGMN-SBC-D104-0-0400 (C0081205 Spk H, 400 ng/L Lab Spike)	400	NQ	297	74	400	35.4	370	84
CGMN-SBC-D104-0-0450 (C0081206 Spk I, 40 ng/L Lab Spike)	40	ND	34.6	87	40	22.9	62.1	98
CGMN-SBC-D104-0-0450 (C0081206 Spk J, 400 ng/L Lab Spike)	400	ND	309	77	400	22.9	370	87
CGMN-SBC-D104-DB-0450 (C0081207 Spk K, 40 ng/L Lab Spike)	40	NQ	32.5	81	40	24.6	59.2	87
CGMN-SBC-D104-DB-0450 (C0081207 Spk L, 400 ng/L Lab Spike)	400	NQ	319	80	400	24.6	402	94
CGMN-SBC-D104-0-0500 (C0081208 Spk C, 40 ng/L Lab Spike)	40	NQ	33.0	83	40	7.91	46.3	96
CGMN-SBC-D104-0-0500 (C0081208 Spk D, 400 ng/L Lab Spike)	400	NQ	355	89	400	7.91	402	99
CGMN-SBC-D104-0-0550 (C0081209 Spk E, 40 ng/L Lab Spike)	40	NQ	37.9	95	40	6.00	46.5	101
CGMN-SBC-D104-0-0550 (C0081209 Spk F, 400 ng/L Lab Spike)	400	NQ	353	88	400	6.00	422	104
CGMN-SBC-D104-0-0600 (C0081210 Spk G, 40 ng/L Lab Spike)	40	ND	33.0	83	40	5.92	46.3	101
CGMN-SBC-D104-0-0600 (C0081210 Spk H, 400 ng/L Lab Spike)	400	ND	310	78	400	5.92	382	94
CGMN-SBC-D104-0-0650 (C0081211 Spk I, 40 ng/L Lab Spike)	40	ND	32.1	80	40	3.47	42.2	97
CGMN-SBC-D104-0-0650 (C0081211 Spk J, 400 ng/L Lab Spike)	400	ND	323	81	400	3.47	372	92
CGMN-SBC-D103-0-0000 (C0081212 Spk K, 40 ng/L Lab Spike)	40	ND	33.2	83	40	ND	37.5	94
CGMN-SBC-D103-0-0000 (C0081212 Spk L, 400 ng/L Lab Spike)	400	ND	259	65	400	ND	381	95

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D103-0-0050 (C0001213 Spk C, 40 ng/L Lab Spike)	40	ND	38.3	96	40	0.663	38.4	95
CGMN-SBC-D103-0-0050 (C0001213 Spk D, 400 ng/L Lab Spike)	400	ND	360	90	400	0.663	362	90
CGMN-SBC-D103-0-0100 (C0001214 Spk E, 40 ng/L Lab Spike)	40	ND	36.8	92	40	0.840	39.2	96
CGMN-SBC-D103-0-0100 (C0001214 Spk F, 400 ng/L Lab Spike)	400	ND	350	88	400	0.840	380	95
CGMN-SBC-D103-0-0150 (C0001215 Spk G, 40 ng/L Lab Spike)	40	ND	32.8	82	40	2.62	37.8	88
CGMN-SBC-D103-0-0150 (C0001215 Spk H, 400 ng/L Lab Spike)	400	ND	343	86	400	2.62	359	89
CGMN-SBC-D103-DB-0150 (C0001216 Spk I, 40 ng/L Lab Spike)	40	ND	34.9	87	40	2.63	39.7	93
CGMN-SBC-D103-DB-0150 (C0001216 Spk J, 400 ng/L Lab Spike)	400	ND	357	89	400	2.63	372	92
CGMN-SBC-D103-0-0200 (C0001217 Spk K, 40 ng/L Lab Spike)	40	0.683	36.3	89	40	9.92	45.9	90
CGMN-SBC-D103-0-0200 (C0001217 Spk L, 400 ng/L Lab Spike)	400	0.683	339	85	400	9.92	378	92
CGMN-SBC-D103-0-0250 (C0001219 Spk C, 40 ng/L Lab Spike)	40	1.21	36.7	89	40	10.9	49.0	95
CGMN-SBC-D103-0-0250 (C0001219 Spk D, 400 ng/L Lab Spike)	400	1.21	370	92	400	10.9	397	97
CGMN-SBC-D103-0-0300 (C0001220 Spk E, 40 ng/L Lab Spike)	40	NQ	37.0	93	40	5.83	46.3	101
CGMN-SBC-D103-0-0300 (C0001220 Spk F, 400 ng/L Lab Spike)	400	NQ	329	82	400	5.83	347	85
CGMN-SBC-D103-0-0350 (C0001221 Spk G, 40 ng/L Lab Spike)	40	0.548	34.3	84	40	13.4	52.7	98
CGMN-SBC-D103-0-0350 (C0001221 Spk H, 400 ng/L Lab Spike)	400	0.548	308	78	400	13.4	332	80
CGMN-SBC-D103-0-0400 (C0001222 Spk I, 40 ng/L Lab Spike)	40	0.748	33.6	83	40	34.6	71.6	93
CGMN-SBC-D103-0-0400 (C0001222 Spk J, 400 ng/L Lab Spike)	400	0.748	320	80	400	34.6	360	81
CGMN-SBC-D103-0-0450 (C0001236 Spk K, 40 ng/L Lab Spike)	40	NR	NR	NR	40	8.48	44.4	90
CGMN-SBC-D103-0-0450 (C0001236 Spk L, 400 ng/L Lab Spike)	400	NR	NR	NR	400	8.48	375	92

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D103-0-0500 (C0081238 Spk C, 40 ng/L Lab Spike)	40	ND	39.1	98	40	3.98	43.4	99
CGMN-SBC-D103-0-0500 (C0081238 Spk D, 400 ng/L Lab Spike)	400	ND	322	81	400	3.98	344	85
CGMN-SBC-D103-0-0550 (C0081239 Spk E, 40 ng/L Lab Spike)	40	NQ	35.8	90	40	3.58	39.6	90
CGMN-SBC-D103-0-0550 (C0081239 Spk F, 400 ng/L Lab Spike)	400	NQ	341	85	400	3.58	360	89
CGMN-SBC-D103-0-0600 (C0081240 Spk G, 40 ng/L Lab Spike)	40	ND	33.9	85	40	4.38	41.0	92
CGMN-SBC-D103-0-0600 (C0081240 Spk H, 400 ng/L Lab Spike)	400	ND	315	79	400	4.38	338	83
CGMN-SBC-D103-0-0650 (C0081241 Spk I, 40 ng/L Lab Spike)	40	NQ	35.1	88	40	7.33	46.3	97
CGMN-SBC-D103-0-0650 (C0081241 Spk J, 400 ng/L Lab Spike)	400	NQ	334	84	400	7.33	360	88
CGMN-SBC-D801-0-0000 (C0081248 Spk K, 40 ng/L Lab Spike)	40	0.491	34.2	84	40	2.41	38.6	90
CGMN-SBC-D801-0-0000 (C0081248 Spk L, 400 ng/L Lab Spike)	400	0.491	347	87	400	2.41	338	84
CGMN-SBC-D801-0-0050 (C0081249 Spk C, 40 ng/L Lab Spike)	40	1.16	37.2	90	40	4.03	39.4	88
CGMN-SBC-D801-0-0050 (C0081249 Spk D, 400 ng/L Lab Spike)	400	1.16	347	86	400	4.03	348	86
CGMN-SBC-D801-0-0100 (C0081250 Spk E, 40 ng/L Lab Spike)	40	1.30	36.1	87	40	4.30	41.1	92
CGMN-SBC-D801-0-0100 (C0081250 Spk F, 400 ng/L Lab Spike)	400	1.30	315	78	400	4.30	349	86
CGMN-SBC-D801-0-0150 (C0081251 Spk G, 40 ng/L Lab Spike)	40	0.538	34.8	86	40	2.13	38.1	90
CGMN-SBC-D801-0-0150 (C0081251 Spk H, 400 ng/L Lab Spike)	400	0.538	350	87	400	2.13	356	88
CGMN-SBC-D801-0-0200 (C0081252 Spk I, 40 ng/L Lab Spike)	40	0.920	37.1	90	40	3.66	40.7	93
CGMN-SBC-D801-0-0200 (C0081252 Spk J, 400 ng/L Lab Spike)	400	0.920	338	84	400	3.66	354	88
CGMN-SBC-D101-0-0000 (C0081274 Spk K, 40 ng/L Lab Spike)	40	NQ	29.8	75	40	1.22	35.7	86
CGMN-SBC-D101-0-0000 (C0081274 Spk L, 400 ng/L Lab Spike)	400	NQ	292	73	400	1.22	341	85

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D101-0-0050 (C0081276 Spk C, 40 ng/L Lab Spike)	40	5.36	41.6	91	40	6.45	41.1	87
CGMN-SBC-D101-0-0050 (C0081275 Spk D, 400 ng/L Lab Spike)	400	5.36	379	93	400	6.45	368	90
CGMN-SBC-D101-0-0100 (C0081277 Spk E, 40 ng/L Lab Spike)	40	1.95	36.8	87	40	30.2	72.2	105
CGMN-SBC-D101-0-0100 (C0081277 Spk F, 400 ng/L Lab Spike)	400	1.96	368	92	400	30.2	378	87
CGMN-SBC-D101-DB-0100 (C0081278 Spk G, 40 ng/L Lab Spike)	40	2.03	35.0	82	40	29.1	63.6	86
CGMN-SBC-D101-DB-0100 (C0081278 Spk H, 400 ng/L Lab Spike)	400	2.03	360	89	400	29.1	375	86
CGMN-SBC-D101-0-0150 (C0081279 Spk I, 40 ng/L Lab Spike)	40	1.14	33.2	80	40	6.56	40.6	85
CGMN-SBC-D101-0-0150 (C0081279 Spk J, 400 ng/L Lab Spike)	400	1.14	344	86	400	6.56	363	89
CGMN-SBC-D101-0-0200 (C0081280 Spk K, 40 ng/L Lab Spike)	40	0.790	37.4	92	40	3.61	39.2	89
CGMN-SBC-D101-0-0200 (C0081280 Spk L, 400 ng/L Lab Spike)	400	0.790	357	89	400	3.61	364	88
CGMN-SBC-D102-0-0000 (C0081281 Spk C, 40 ng/L Lab Spike)	40	1.59	37.0	89	40	7.25	40.6	83
CGMN-SBC-D102-0-0000 (C0081281 Spk D, 400 ng/L Lab Spike)	400	1.59	346	86	400	7.25	336	82
CGMN-SBC-D102-0-0050 (C0081282 Spk E, 40 ng/L Lab Spike)	40	2.55	40.0	94	40	31.6	65.7	85
CGMN-SBC-D102-0-0050 (C0081282 Spk F, 400 ng/L Lab Spike)	400	2.55	390	97	400	31.8	399	92
CGMN-SBC-D102-0-0100 (C0081283 Spk G, 40 ng/L Lab Spike)	40	0.602	36.4	84	40	21.3	54.5	83
CGMN-SBC-D102-0-0100 (C0081283 Spk H, 400 ng/L Lab Spike)	400	0.502	342	84	400	21.3	368	87
CGMN-SBC-D102-0-0150 (C0081284 Spk I, 40 ng/L Lab Spike)	40	NQ	36.3	88	40	5.07	39.9	87
CGMN-SBC-D102-0-0150 (C0081284 Spk J, 400 ng/L Lab Spike)	400	NQ	317	79	400	5.07	354	87
CGMN-SBC-D102-0-0200 (C0081285 Spk K, 40 ng/L Lab Spike)	40	NQ	33.5	84	40	6.66	42.7	90
CGMN-SBC-D102-0-0200 (C0081285 Spk L, 400 ng/L Lab Spike)	400	NQ	350	88	400	6.66	371	91

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-B1501-0-0000 (C0001342 Spk C, 40 ng/L Lab Spike)	40	1.60	34.7	93	40	2.58	39.7	93
CGMN-SBC-B1501-0-0000 (C0001342 Spk D, 400 ng/L Lab Spike)	400	1.60	359	89	400	2.58	338	84
CGMN-SBC-B1501-0-0050 (C0001343 Spk E, 40 ng/L Lab Spike)	40	1.53	37.3	89	40	2.71	38.5	89
CGMN-SBC-B1501-0-0050 (C0001343 Spk F, 400 ng/L Lab Spike)	400	1.53	335	83	400	2.71	331	82
CGMN-SBC-B1501-0-0100 (C0001344 Spk G, 40 ng/L Lab Spike)	40	0.692	34.6	85	40	1.99	36.4	88
CGMN-SBC-B1501-0-0100 (C0001344 Spk H, 400 ng/L Lab Spike)	400	0.692	356	89	400	1.99	341	85
CGMN-SBC-B1501-0-0150 (C0001345 Spk I, 40 ng/L Lab Spike)	40	0.456	31.8	78	40	0.784	34.3	84
CGMN-SBC-B1501-0-0150 (C0001346 Spk J, 400 ng/L Lab Spike)	400	0.456	341	85	400	0.784	334	83
CGMN-SBC-B1501-0-0200 (C0001346 Spk K, 40 ng/L Lab Spike)	40	0.677	33.4	82	40	NQ	35.2	88
CGMN-SBC-B1501-0-0200 (C0001346 Spk L, 400 ng/L Lab Spike)	400	0.677	319	80	400	NQ	337	84
CGMN-SBC-D501-0-0000 (C0001242 Spk C, 40 ng/L Lab Spike)	40	1.31	40.9	99	40	16.2	55.1	97
CGMN-SBC-D501-0-0000 (C0001242 Spk D, 400 ng/L Lab Spike)	400	1.31	368	92	400	16.2	370	88
CGMN-SBC-D501-0-0050 (C0001243 Spk E, 40 ng/L Lab Spike)	40	1.39	39.0	94	40	52.1	92.8	102
CGMN-SBC-D501-0-0050 (C0001243 Spk F, 400 ng/L Lab Spike)	400	1.39	375	93	400	52.1	404	88
CGMN-SBC-D501-DB-0050 (C0001244 Spk G, 40 ng/L Lab Spike)	40	1.43	34.9	84	40	57.8	79.4	54
CGMN-SBC-D501-DB-0050 (C0001244 Spk H, 400 ng/L Lab Spike)	400	1.43	339	84	400	57.8	373	79
CGMN-SBC-D501-0-0100 (C0001245 Spk I, 40 ng/L Lab Spike)	40	1.43	39.0	94	40	24.1	61.9	95
CGMN-SBC-D501-0-0100 (C0001245 Spk J, 400 ng/L Lab Spike)	400	1.43	362	90	400	24.1	364	85
CGMN-SBC-D501-0-0150 (C0001246 Spk K, 40 ng/L Lab Spike)	40	ND	35.6	89	40	0.432	35.0	86
CGMN-SBC-D501-0-0150 (C0001246 Spk L, 400 ng/L Lab Spike)	400	ND	354	89	400	0.432	357	89

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

	C4 Sulfonate PFBS				C6 Sulfonate PFHS			
Sample Description	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D501-0-0200 (C0081247 Spk C, 40 ng/L Lab Spike)	40	ND	36.2	91	40	0.713	38.1	86
CGMN-SBC-D501-0-0200 (C0081247 Spk D, 400 ng/L Lab Spike)	400	ND	336	84	400	0.713	331	83
CGMN-SBC-FTA02-0-0000 (C0081253 Spk E, 40 ng/L Lab Spike)	40	NQ	33.5	84	40	24.7	58.7	85
CGMN-SBC-FTA02-0-0000 (C0081253 Spk F, 400 ng/L Lab Spike)	400	NQ	316	79	400	24.7	343	80
CGMN-SBC-FTA02-0-0050 (C0081254 Spk G, 40 ng/L Lab Spike)	40	ND	36.1	90	40	7.77	44.9	93
CGMN-SBC-FTA02-0-0050 (C0081254 Spk H, 400 ng/L Lab Spike)	400	ND	346	87	400	7.77	356	87
CGMN-SBC-FTA02-DB-0100 (C0081255 Spk I, 40 ng/L Lab Spike)	40	ND	34.6	87	40	6.31	39.7	83
CGMN-SBC-FTA02-DB-0100 (C0081255 Spk J, 400 ng/L Lab Spike)	400	ND	304	76	400	6.31	348	85
CGMN-SBC-FTA02-0-0100 (C0081256 Spk K, 40 ng/L Lab Spike)	40	ND	36.0	90	40	6.04	47.9	105
CGMN-SBC-FTA02-0-0100 (C0081256 Spk L, 400 ng/L Lab Spike)	400	ND	325	81	400	6.04	360	88
CGMN-SBC-FTA02-0-0150 (C0081257 Spk C, 40 ng/L Lab Spike)	40	ND	36.4	91	40	18.9	53.0	85
CGMN-SBC-FTA02-0-0150 (C0081257 Spk D, 400 ng/L Lab Spike)	400	ND	322	81	400	18.9	344	81
CGMN-SBC-FTA02-0-0200 (C0081258 Spk E, 40 ng/L Lab Spike)	40	ND	36.3	91	40	20.5	53.8	83
CGMN-SBC-FTA02-0-0200 (C0081258 Spk F, 400 ng/L Lab Spike)	400	ND	303	76	400	20.5	342	80
CGMN-SBC-FTA03-0-0000 (C0081259 Spk G, 40 ng/L Lab Spike)	40	20.2	63.7	109	40	271	292	*
CGMN-SBC-FTA03-0-0000 (C0081259 Spk H, 400 ng/L Lab Spike)	400	20.2	378	89	400	271	561	73
CGMN-SBC-FTA03-0-0100 (C0081260 Spk I, 40 ng/L Lab Spike)	40	0.960	35.5	86	40	10.6	47.2	92
CGMN-SBC-FTA03-0-0100 (C0081260 Spk J, 400 ng/L Lab Spike)	400	0.960	352	88	400	10.6	343	83
CGMN-SBC-FTA03-0-0100 (C0081262 Spk K, 40 ng/L Lab Spike)	40	NQ	37.3	93	40	1.96	38.1	90
CGMN-SBC-FTA03-0-0100 (C0081262 Spk L, 400 ng/L Lab Spike)	400	NQ	319	80	400	1.96	334	83

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found in Sample (ng/g)	C4 Sulfonate PFBS Amount Recovered (ng/g)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	C6 Sulfonate PFHS Amt Found in Sample (ng/g)	C6 Sulfonate PFHS Amount Recovered (ng/g)	C6 Sulfonate PFHS Recovery (%)
CGMN-SBC-FTA03-0-0150 (C0001263 Spk C, 40 ng/L Lab Spike)	40	ND	29.7	74	40	0.678	34.0	83
CGMN-SBC-FTA03-0-0150 (C0001263 Spk D, 400 ng/L Lab Spike)	400	ND	313	78	400	0.678	341	85
CGMN-SBC-FTA03-0-0200 (C0001264 Spk E, 40 ng/L Lab Spike)	40	0.912	31.8	77	40	6.81	41.1	86
CGMN-SBC-FTA03-0-0200 (C0001264 Spk F, 400 ng/L Lab Spike)	400	0.912	319	80	400	6.81	335	82
CGMN-SBC-FTA01-0-0000 (C0001269 Spk G, 40 ng/L Lab Spike)	40	7.48	39.5	80	40	286	265	*
CGMN-SBC-FTA01-0-0000 (C0001269 Spk H, 400 ng/L Lab Spike)	400	7.48	318	78	400	286	496	52
CGMN-SBC-FTA01-0-0050 (C0001270 Spk I, 40 ng/L Lab Spike)	40	1.98	34.5	81	40	95.2	121	66
CGMN-SBC-FTA01-0-0050 (C0001270 Spk J, 400 ng/L Lab Spike)	400	1.98	341	85	400	95.2	407	78
CGMN-SBC-FTA01-0-0100 (C0001271 Spk K, 40 ng/L Lab Spike)	40	1.91	34.5	81	40	32.2	62.0	76
CGMN-SBC-FTA01-0-0100 (C0001271 Spk L, 400 ng/L Lab Spike)	400	1.91	339	84	400	32.2	349	79
CGMN-SBC-FTA01-0-0150 (C0001272 Spk C, 40 ng/L Lab Spike)	40	1.38	34.2	82	40	49.1	106	142
CGMN-SBC-FTA01-0-0150 (C0001272 Spk D, 400 ng/L Lab Spike)	400	1.38	337	84	400	49.1	397	87
CGMN-SBC-FTA01-0-0200 (C0001273 Spk E, 40 ng/L Lab Spike)	40	1.54	31.8	76	40	191	194	*
CGMN-SBC-FTA01-0-0200 (C0001273 Spk F, 400 ng/L Lab Spike)	400	1.54	295	73	400	191	478	72
CGMN-SBC-WPA01-0-0000 (C000[illegible] Spk G, 40 ng/L Lab Spike)	40	NQ	34.1	85	40	NQ	34.8	87
CGMN-SBC-WPA01-0-0000 (C000[illegible] Spk H, 400 ng/L Lab Spike)	400	NQ	291	73	400	NQ	293	73
CGMN-SBC-WPA01-0-0050 (C000[illegible] Spk I, 40 ng/L Lab Spike)	40	ND	32.2	81	40	NQ	33.6	84
CGMN-SBC-WPA01-0-0050 (C000[illegible] Spk J, 400 ng/L Lab Spike)	400	ND	333	83	400	NQ	346	87
CGMN-SBC-WPA01-0-0100 (C0001331 Spk K, 40 ng/L Lab Spike)	40	ND	31.7	79	40	NQ	33.5	84
CGMN-SBC-WPA01-0-0100 (C0001331 Spk L, 400 ng/L Lab Spike)	400	ND	352	88	400	NQ	366	92

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found in Sample (ng/g)	C4 Sulfonate PFBS Amount Recovered (ng/g)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	C6 Sulfonate PFHS Amt Found in Sample (ng/g)	C6 Sulfonate PFHS Amount Recovered (ng/g)	C6 Sulfonate PFHS Recovery (%)
CGMN-SBC-WPA01-DB-0100 (C0081332 Spk C, 40 ng/L Lab Spike)	40	ND	33.4	84	40	NQ	33.5	84
CGMN-SBC-WPA01-DB-0100 (C0081332 Spk D, 400 ng/L Lab Spike)	400	ND	353	88	400	NQ	331	83
CGMN-SBC-WPA01-0-0150 (C0081333 Spk E, 40 ng/L Lab Spike)	40	1.58	35.8	86	40	8.28	39.8	84
CGMN-SBC-WPA01-0-0150 (C0081333 Spk F, 400 ng/L Lab Spike)	400	1.58	385	91	400	8.28	382	89
CGMN-SBC-WPA01-0-0200 (C0081334 Spk G, 40 ng/L Lab Spike)	40	4.93	36.0	75	40	NR	NR	NR
CGMN-SBC-WPA01-0-0200 (C0081334 Spk H, 400 ng/L Lab Spike)	400	4.96	362	89	400	NR	NR	NR
CGMN-SBC-BKG01-0-0000 (C0081335 Spk I, 40 ng/L Lab Spike)	40	ND	19.6	49	40	ND	34.1	85
CGMN-SBC-BKG01-0-0000 (C0081335 Spk J, 400 ng/L Lab Spike)	400	ND	186	47	400	ND	354	89
CGMN-SBC-BKG01-0-0050 (C0081336 Spk K, 40 ng/L Lab Spike)	40	ND	26.8	67	40	ND	34.9	87
CGMN-SBC-BKG01-0-0050 (C0081336 Spk L, 400 ng/L Lab Spike)	400	ND	279	70	400	ND	327	82
CGMN-SBC-BKG01-0-0100 (C0081338 Spk C, 40 ng/L Lab Spike)	40	ND	33.5	84	40	ND	37.5	94
CGMN-SBC-BKG01-0-0100 (C0081338 Spk D, 400 ng/L Lab Spike)	400	ND	324	81	400	ND	340	85
CGMN-SBC-BKG01-DB-0100 (C0081339 Spk E, 40 ng/L Lab Spike)	40	ND	33.8	85	40	ND	35.2	88
CGMN-SBC-BKG01-DB-0100 (C0081339 Spk F, 400 ng/L Lab Spike)	400	ND	328	82	400	ND	338	85
CGMN-SBC-BKG01-0-0150 (C0081340 Spk G, 40 ng/L Lab Spike)	40	ND	31.3	78	40	ND	35.3	88
CGMN-SBC-BKG01-0-0150 (C0081340 Spk H, 400 ng/L Lab Spike)	400	ND	308	77	400	ND	351	88
CGMN-SBC-BKG01-0-0200 (C0081341 Spk I, 40 ng/L Lab Spike)	40	ND	34.4	86	40	ND	36.6	92
CGMN-SBC-BKG01-0-0200 (C0081341 Spk J, 400 ng/L Lab Spike)	400	ND	340	85	400	ND	348	87
CGMN-SBC-BKG02-0-0000 (C0081347 Spk K, 40 ng/L Lab Spike)	40	ND	34.0	85	40	ND	36.4	91
CGMN-SBC-BKG02-0-0000 (C0081347 Spk L, 400 ng/L Lab Spike)	400	ND	332	83	400	ND	338	85

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found in Sample (ng/g)	C4 Sulfonate PFBS Amount Recovered (ng/g)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	C6 Sulfonate PFHS Amt Found in Sample (ng/g)	C6 Sulfonate PFHS Amount Recovered (ng/g)	C6 Sulfonate PFHS Recovery (%)
CGMN-SBC-BKG02-0-0050 (C0081346 Spk C, 40 ng/L Lab Spike)	40	ND	31.2	78	40	ND	34.8	87
CGMN-SBC-BKG02-0-0050 (C0081346 Spk D, 400 ng/L Lab Spike)	400	ND	291	73	400	ND	319	80
CGMN-SBC-BKG02-DB-0100 (C0081349 Spk E, 40 ng/L Lab Spike)	40	ND	30.5	76	40	ND	36.3	91
CGMN-SBC-BKG02-DB-0100 (C0081348 Spk F, 400 ng/L Lab Spike)	400	ND	315	79	400	ND	356	89
CGMN-SBC-BKG02-0-0100 (C0081380 Spk G, 40 ng/L Lab Spike)	40	ND	32.2	81	40	ND	36.2	91
CGMN-SBC-BKG02-0-0100 (C0081380 Spk H, 400 ng/L Lab Spike)	400	ND	284	71	400	ND	327	82
CGMN-SBC-BKG02-0-0150 (C0081381 Spk I, 40 ng/L Lab Spike)	40	ND	33.2	83	40	ND	36.7	92
CGMN-SBC-BKG02-0-0150 (C0081381 Spk J, 400 ng/L Lab Spike)	400	ND	285	71	400	ND	331	83
CGMN-SBC-BKG02-0-0200 (C0081382 Spk K, 40 ng/L Lab Spike)	40	ND	27.6	69	40	ND	35.8	90
CGMN-SBC-BKG02-0-0200 (C0081382 Spk L, 400 ng/L Lab Spike)	400	ND	320	80	400	ND	338	85
CGMN-SS-BKG01-0-0000 (C0081383 Spk C, 40 ng/L Lab Spike)	40	ND	31.2	78	40	ND	34.5	86
CGMN-SS-BKG01-0-0000 (C0081383 Spk D, 400 ng/L Lab Spike)	400	ND	287	72	400	ND	317	79
CGMN-SS-BKG01-0-0005 (C0081384 Spk E, 40 ng/L Lab Spike)	40	ND	27.9	70	40	ND	37.0	93
CGMN-SS-BKG01-0-0005 (C0081384 Spk F, 400 ng/L Lab Spike)	400	ND	278	70	400	ND	363	91
CGMN-SS-D601-0-0000 (C0081385 Spk G, 40 ng/L Lab Spike)	40	NQ	34.6	87	40	0.686	32.2	81
CGMN-SS-D601-0-0000 (C0081385 Spk H, 400 ng/L Lab Spike)	400	NQ	288	72	400	0.686	289	72
CGMN-SS-D601-0-0005 (C0081386 Spk I, 40 ng/L Lab Spike)	40	ND	28.4	71	40	NQ	33.4	84
CGMN-SS-D601-0-0005 (C0081386 Spk J, 400 ng/L Lab Spike)	400	ND	252	63	400	NQ	324	81
CGMN-SS-D601-DB-0005 (C0081387 Spk K, 40 ng/L Lab Spike)	40	ND	29.5	74	40	NQ	35.3	88
CGMN-SS-D601-DB-0005 (C0081387 Spk L, 400 ng/L Lab Spike)	400	ND	279	70	400	NQ	333	83

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-B10201-0-0000 (C0081365 Spk C, 40 ng/L Lab Spike)	40	ND	33.7	84	40	0.413	34.7	86
CGMN-SS-B10201-0-0000 (C0081365 Spk D, 400 ng/L Lab Spike)	400	ND	357	89	400	0.413	342	85
CGMN-SS-B10201-0-0005 (C0081366 Spk E, 40 ng/L Lab Spike)	40	ND	30.4	76	40	ND	37.1	93
CGMN-SS-B10201-0-0005 (C0081366 Spk F, 400 ng/L Lab Spike)	400	ND	317	79	400	ND	366	92
CGMN-SS-B2201-0-0000 (C0081367 Spk G, 40 ng/L Lab Spike)	40	NQ	35.3	88	40	ND	35.9	90
CGMN-SS-B2201-0-0000 (C0081367 Spk H, 400 ng/L Lab Spike)	400	NQ	355	89	400	ND	379	95
CGMN-SS-B2201-0-0005 (C0081368 Spk I, 40 ng/L Lab Spike)	40	ND	37.2	93	40	ND	36.1	90
CGMN-SS-B2201-0-0005 (C0081368 Spk J, 400 ng/L Lab Spike)	400	ND	383	96	400	ND	394	99
CGMN-SS-B2201-DB-0005 (C0081369 Spk K, 40 ng/L Lab Spike)	40	ND	34.7	87	40	ND	36.3	91
CGMN-SS-B2201-DB-0005 (C0081369 Spk L, 400 ng/L Lab Spike)	400	ND	366	92	400	ND	377	94
CGMN-SS-B2501-0-0000 (C0081370 Spk C, 40 ng/L Lab Spike)	40	0.840	35.8	87	40	1.48	39.3	95
CGMN-SS-B2501-0-0000 (C0081370 Spk D, 400 ng/L Lab Spike)	400	0.840	318	79	400	1.48	339	84
CGMN-SS-B2501-0-0005 (C0081371 Spk E, 40 ng/L Lab Spike)	40	ND	36.4	91	40	2.35	39.0	92
CGMN-SS-B2501-0-0005 (C0081371 Spk F, 400 ng/L Lab Spike)	400	ND	322	81	400	2.35	342	85
CGMN-SS-B2601-0-0000 (C0081372 Spk G, 40 ng/L Lab Spike)	40	1.03	29.8	72	40	1.11	37.8	91
CGMN-SS-B2601-0-0000 (C0081372 Spk H, 400 ng/L Lab Spike)	400	1.03	286	71	400	1.11	374	93
CGMN-SS-B2601-0-0005 (C0081373 Spk I, 40 ng/L Lab Spike)	40	NQ	28.0	73	40	2.34	38.0	89
CGMN-SS-B2601-0-0005 (C0081373 Spk J, 400 ng/L Lab Spike)	400	NQ	258	66	400	2.34	367	91
CGMN-SS-B1802-0-0000 (C0081375 Spk K, 40 ng/L Lab Spike)	40	2.45	31.9	74	40	1.46	35.5	85
CGMN-SS-B1802-0-0000 (C0081375 Spk L, 400 ng/L Lab Spike)	400	2.45	308	76	400	1.46	349	87

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found in Sample (ng/g)	C4 Sulfonate PFBS Amount Recovered (ng/g)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	C6 Sulfonate PFHS Amt Found in Sample (ng/g)	C6 Sulfonate PFHS Amount Recovered (ng/g)	C6 Sulfonate PFHS Recovery (%)
CGMN-SS-B1602-0-0006 (C0001376 Spk C, 40 ng/L Lab Spike)	40	0.710	38.5	94	40	5.60	45.0	99
CGMN-SS-B1602-0-0006 (C0001376 Spk D, 400 ng/L Lab Spike)	400	0.710	364	91	400	5.60	367	90
CGMN-SS-B11201-0-0000 (C0001377 Spk E, 40 ng/L Lab Spike)	40	NQ	35.5	89	40	0.856	37.5	92
CGMN-SS-B11201-0-0000 (C0001377 Spk F, 400 ng/L Lab Spike)	400	NQ	352	88	400	0.856	354	88
CGMN-SS-B11201-0-0005 (C0001378 Spk G, 40 ng/L Lab Spike)	40	ND	37.6	94	40	NQ	35.5	89
CGMN-SS-B11201-0-0005 (C0001378 Spk H, 400 ng/L Lab Spike)	400	ND	378	95	400	NQ	358	90
CGMN-SS-FTA01-0-0000 (C0001379 Spk I, 40 ng/L Lab Spike)	40	ND	32.7	82	40	4.03	37.4	83
CGMN-SS-FTA01-0-0000 (C0001379 Spk J, 400 ng/L Lab Spike)	400	ND	326	82	400	4.03	321	79
CGMN-SS-FTA01-0-0005 (C0001380 Spk K, 40 ng/L Lab Spike)	40	ND	24.6	62	40	1.25	36.6	88
CGMN-SS-FTA01-0-0005 (C0001380 Spk L, 400 ng/L Lab Spike)	400	ND	235	59	400	1.25	364	91
CGMN-SS-FTA01-DB-0005 (C0001381 Spk C, 40 ng/L Lab Spike)	40	ND	27.7	69	40	1.42	38.3	92
CGMN-SS-FTA01-DB-0005 (C0001381 Spk D, 400 ng/L Lab Spike)	400	ND	234	59	400	1.42	364	91
CGMN-SS-FTA02-0-0000 (C0001382 Spk E, 40 ng/L Lab Spike)	40	3.58	47.4	110	40	222	256	*
CGMN-SS-FTA02-0-0000 (C0001382 Spk F, 400 ng/L Lab Spike)	400	3.56	314	83	400	222	490	67
CGMN-SS-FTA02-0-0005 (C0001383 Spk G, 40 ng/L Lab Spike)	40	1.34	33.6	81	40	37.8	67.6	75
CGMN-SS-FTA02-0-0005 (C0001383 Spk H, 400 ng/L Lab Spike)	400	1.34	302	75	400	37.8	376	85
CGMN-SS-B8801-0-0000 (C0001385 Spk I, 40 ng/L Lab Spike)	40	4.79	42.7	95	40	13.8	44.7	87
CGMN-SS-B8801-0-0000 (C0001385 Spk J, 400 ng/L Lab Spike)	400	4.79	388	98	400	13.8	386	93
CGMN-SS-B6601-DB-0000 (C0001386 Spk K, 40 ng/L Lab Spike)	40	4.18	39.8	89	40	12.1	50.0	96
CGMN-SS-B6601-DB-0000 (C0001386 Spk L, 400 ng/L Lab Spike)	400	4.18	372	92	400	12.1	368	89

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-B6801-0-0005 (C0061387 Spk C, 40 ng/L Lab Spike)	40	1.70	37.1	89	40	5.48	44.2	97
CGMN-SS-B5801-0-0005 (C0061387 Spk D, 400 ng/L Lab Spike)	400	1.70	368	90	400	5.48	370	91
CGMN-SS-B1601-0-0000 (C0061382 Spk E, 40 ng/L Lab Spike)	40	3.61	22.3	47	40	ND	40.0	100
CGMN-SS-B1601-0-0000 (C0061382 Spk F, 400 ng/L Lab Spike)	400	3.61	200	49	400	ND	371	93
CGMN-SS-B1601-0-0005 (C0061383 Spk G, 40 ng/L Lab Spike)	40	9.20	39.4	76	40	0.624	40.2	99
CGMN-SS-B1601-0-0005 (C0061383 Spk H, 400 ng/L Lab Spike)	400	9.20	339	82	400	0.624	367	92
CGMN-SS-IC04-0-0000 (C0061385 Spk I, 40 ng/L Lab Spike)	40	ND	39.6	99	40	ND	38.0	95
CGMN-SS-IC04-0-0000 (C0061385 Spk J, 400 ng/L Lab Spike)	400	ND	377	94	400	ND	381	95
CGMN-SS-IC04-0-0005 (C0061386 Spk K, 40 ng/L Lab Spike)	40	ND	24.0	60	40	ND	36.8	92
CGMN-SS-IC04-0-0005 (C0061386 Spk L, 400 ng/L Lab Spike)	400	ND	240	60	400	ND	374	94
CGMN-SS-IC03-0-0000 (C0061387 Spk C, 40 ng/L Lab Spike)	40	ND	43.3	108	40	ND	40.3	101
CGMN-SS-IC03-0-0000 (C0061387 Spk D, 400 ng/L Lab Spike)	400	ND	375	94	400	ND	362	91
CGMN-SS-IC03-0-0005 (C0061388 Spk E, 40 ng/L Lab Spike)	40	ND	36.7	87	40	ND	35.1	88
CGMN-SS-IC03-0-0005 (C0061388 Spk F, 400 ng/L Lab Spike)	400	ND	345	86	400	ND	331	83
CGMN-SS-IC01-0-0000 (C0061399 Spk G, 40 ng/L Lab Spike)	40	ND	37.9	95	40	0.928	38.3	93
CGMN-SS-IC01-0-0000 (C0061399 Spk H, 400 ng/L Lab Spike)	400	ND	378	95	400	0.928	342	85
CGMN-SS-IC01-0-0005 (C0061400 Spk I, 40 ng/L Lab Spike)	40	ND	33.0	83	40	1.41	35.8	86
CGMN-SS-IC01-0-0005 (C0061400 Spk J, 400 ng/L Lab Spike)	400	ND	293	73	400	1.41	314	78
CGMN-SS-IC02-0-0000 (C0061401 Spk K, 40 ng/L Lab Spike)	40	ND	35.0	88	40	ND	34.2	86
CGMN-SS-IC02-0-0000 (C0061401 Spk L, 400 ng/L Lab Spike)	400	ND	313	78	400	ND	323	81

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFBS and PFHS in Soil Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-IC02-0-0005 (C0081402 Spk C, 40 ng/L Lab Spike)	40	ND	36.2	91	40	ND	40.8	102
CGMN-SS-IC02-0-0005 (C0081402 Spk D, 400 ng/L Lab Spike)	400	ND	334	84	400	ND	428	107
CGMN-SS-D503-0-0000 (C0081403 Spk E, 40 ng/L Lab Spike)	40	ND	37.8	95	40	0.984	39.5	99
CGMN-SS-D503-0-0000 (C0081403 Spk F, 400 ng/L Lab Spike)	400	ND	358	90	400	0.984	378	95
CGMN-SS-D503-0-0005 (C0081404 Spk G, 40 ng/L Lab Spike)	40	ND	34.8	87	40	NQ	40.5	101
CGMN-SS-D503-0-0005 (C0081404 Spk H, 400 ng/L Lab Spike)	400	ND	348	87	400	NQ	387	97
CGMN-SS-D501-0-0000 (C0081405 Spk I, 40 ng/L Lab Spike)	40	NQ	38.9	97	40	1.10	39.5	98
CGMN-SS-D501-0-0000 (C0081405 Spk J, 400 ng/L Lab Spike)	400	NQ	332	83	400	1.10	330	82
CGMN-SS-D501-0-0005 (C0081406 Spk K, 40 ng/L Lab Spike)	40	0.844	38.0	93	40	1.15	40.7	90
CGMN-SS-D501-0-0005 (C0081406 Spk L, 400 ng/L Lab Spike)	400	0.844	346	86	400	1.15	368	89
CGMN-SS-B801-0-0000 (C0081407 Spk C, 40 ng/L Lab Spike)	40	ND	38.8	97	40	0.748	40.6	100
CGMN-SS-B801-0-0000 (C0081407 Spk D, 400 ng/L Lab Spike)	400	ND	350	88	400	0.748	351	88
CGMN-SS-B801-0-0005 (C0081408 Spk E, 40 ng/L Lab Spike)	40	ND	34.8	87	40	1.06	36.9	90
CGMN-SS-B801-0-0005 (C0081408 Spk F, 400 ng/L Lab Spike)	400	ND	345	86	400	1.06	370	92
CGMN-SS-D502-0-0000 (C0081409 Spk G, 40 ng/L Lab Spike)	40	ND	34.2	86	40	0.607	36.6	90
CGMN-SS-D502-0-0000 (C0081409 Spk H, 400 ng/L Lab Spike)	400	ND	364	91	400	0.607	383	96
CGMN-SS-D502-0-0005 (C0081410 Spk I, 40 ng/L Lab Spike)	40	ND	37.1	93	40	6.48	44.2	94
CGMN-SS-D502-0-0005 (C0081410 Spk J, 400 ng/L Lab Spike)	400	ND	357	89	400	6.48	382	94
			Average:	84			Average:	[illegible]
			Standard Deviation:	9			Standard Deviation:	10

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-D101-0-0005 (C0001358 Spk C, 40 ng/L Lab Spike)	40	16.9	53.6	92	40	1.05	41.6	101
CGMN-SS-D101-0-0005 (C0001358 Spk D, 400 ng/L Lab Spike)	400	16.9	360	86	400	1.05	367	91
CGMN-SS-D101-DB-0005 (C0001359 Spk E, 40 ng/L Lab Spike)	40	16.9	57.8	102	40	0.536	37.4	92
CGMN-SS-D101-DB-0005 (C0001359 Spk F, 400 ng/L Lab Spike)	400	16.9	360	86	400	0.536	329	82
CGMN-SS-D201-0-0000 (C0001360 Spk G, 40 ng/L Lab Spike)	40	46.5	73.6	68	40	3.34	35.0	88
CGMN-SS-D201-0-0000 (C0001360 Spk H, 400 ng/L Lab Spike)	400	46.5	353	77	400	3.34	298	75
CGMN-SS-D201-0-0005 (C0001361 Spk I, 40 ng/L Lab Spike)	40	51.6	87.2	89	40	6.96	36.4	91
CGMN-SS-D201-0-0005 (C0001361 Spk J, 400 ng/L Lab Spike)	400	51.6	381	82	400	6.96	316	79
CGMN-SS-D202-0-0000 (C0001362 Spk K, 40 ng/L Lab Spike)	40	984	1120	*	40	20.6	57.0	91
CGMN-SS-D202-0-0000 (C0001362 Spk L, 400 ng/L Lab Spike)	400	984	1220	59	400	20.6	353	83
CGMN-SS-D202-0-0005 (C0001363 Spk C, 40 ng/L Lab Spike)	40	1440	1550	*	40	51.1	83.2	80
CGMN-SS-D202-0-0005 (C0001363 Spk D, 400 ng/L Lab Spike)	400	1440	1680	*	400	51.1	351	75
CGMN-SS-D101-0-0000 (C0001374 Spk E, 40 ng/L Lab Spike)	40	10.6	44.7	85	40	3.35	37.7	86
CGMN-SS-D101-0-0000 (C0001374 Spk F, 400 ng/L Lab Spike)	400	10.6	306	74	400	3.35	282	70
CGMN-SS-B1502-0-0000 (C0001388 Spk G, 40 ng/L Lab Spike)	40	16.4	48.2	80	40	7.61	46.5	97
CGMN-SS-B1502-0-0000 (C0001388 Spk H, 400 ng/L Lab Spike)	400	16.4	364	87	400	7.61	362	89
CGMN-SS-B1502-0-0005 (C0001389 Spk I, 40 ng/L Lab Spike)	40	57.0	87.8	77	40	7.28	44.5	93
CGMN-SS-B1502-0-0005 (C0001389 Spk J, 400 ng/L Lab Spike)	400	57.0	359	78	400	7.28	330	81
CGMN-SS-B1501-0-0000 (C0001390 Spk K, 40 ng/L Lab Spike)	40	12.3	46.7	84	40	17.1	46.6	74
CGMN-SS-B1501-0-0000 (C0001390 Spk L, 400 ng/L Lab Spike)	400	12.3	303	73	400	17.1	306	72

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantitable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-B1501-0-0005 (C0061391 Spk C, 40 ng/L Lab Spike)	40	42.9	75.8	82	40	15.0	41.1	66
CGMN-SS-B1501-0-0005 (C0061391 Spk D, 400 ng/L Lab Spike)	400	42.9	371	82	400	15.0	333	80
CGMN-SBC-D203-0-0000 (C0061163 Spk E, 40 ng/L Lab Spike)	40	2970	3060	*	40	211	218	*
CGMN-SBC-D203-0-0000 (C0061163 Spk F, 400 ng/L Lab Spike)	400	2970	2740	*	400	211	453	61
CGMN-SBC-D203-0-0050 (C0061164 Spk G, 40 ng/L Lab Spike)	40	7060	7300	*	40	1430	1890	*
CGMN-SBC-D203-0-0050 (C0061164 Spk H, 400 ng/L Lab Spike)	400	7060	8560	*	400	1430	2230	*
CGMN-SBC-D203-0-0100 (C0061165 Spk I, 40 ng/L Lab Spike)	40	4420	3960	*	40	2780	2810	*
CGMN-SBC-D203-0-0100 (C0061165 Spk J, 400 ng/L Lab Spike)	400	4420	4450	*	400	2780	3090	*
CGMN-SBC-D203-0-0150 (C0061166 Spk K, 40 ng/L Lab Spike)	40	4670	2980	*	40	4810	3530	*
CGMN-SBC-D203-0-0150 (C0061166 Spk L, 400 ng/L Lab Spike)	400	4670	5130	*	400	4810	4740	*
CGMN-SBC-D203-0-0200 (C0061167 Spk C, 40 ng/L Lab Spike)	40	5550	4270	*	40	4670	3100	*
CGMN-SBC-D203-0-0200 (C0061167 Spk D, 400 ng/L Lab Spike)	400	5550	4340	*	400	4670	3280	*
CGMN-SBC-D203-0-0250 (C0061168 Spk E, 40 ng/L Lab Spike)	40	724	725	*	40	449	471	*
CGMN-SBC-D203-0-0250 (C0061168 Spk F, 400 ng/L Lab Spike)	400	724	1020	74	400	449	775	82
CGMN-SBC-D203-0-0300 (C0061169 Spk G, 40 ng/L Lab Spike)	40	46.1	70.1	60	40	586	505	*
CGMN-SBC-D203-0-0300 (C0061169 Spk H, 400 ng/L Lab Spike)	400	46.1	379	83	400	586	1180	149
CGMN-SBC-D203-DB-0300 (C0061170 Spk I, 40 ng/L Lab Spike)	40	41.2	76.3	88	40	296	528	*
CGMN-SBC-D203-DB-0300 (C0061170 Spk J, 400 ng/L Lab Spike)	400	41.2	376	84	400	296	782	122
CGMN-SBC-D203-0-0350 (C0061171 Spk K, 40 ng/L Lab Spike)	40	12.4	46.2	85	40	837	826	*
CGMN-SBC-D203-0-0350 (C0061171 Spk L, 400 ng/L Lab Spike)	400	12.4	338	81	400	837	1110	118

*Sample residue exceeds the spiking level significantly (3x spiking level), therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D203-0-0400 (C0081172 Spk C, 40 ng/L Lab Spike)	40	7.53	41.0	84	40	167	162	*
CGMN-SBC-D203-0-0400 (C0081172 Spk D, 400 ng/L Lab Spike)	400	7.53	333	81	400	167	471	76
CGMN-SBC-D203-0-0450 (C0081173 Spk E, 40 ng/L Lab Spike)	40	19.1	48.8	74	40	61.0	90.4	74
CGMN-SBC-D203-0-0450 (C0081173 Spk F, 400 ng/L Lab Spike)	400	19.1	349	82	400	61.0	413	88
CGMN-SBC-D202-0-0000 (C0081174 Spk G, 40 ng/L Lab Spike)	40	3930	3660	*	40	206	230	*
CGMN-SBC-D202-0-0000 (C0081174 Spk H, 400 ng/L Lab Spike)	400	3930	3340	*	400	206	391	46
CGMN-SBC-D202-0-0050 (C0081175 Spk I, 40 ng/L Lab Spike)	40	3420	3570	*	40	2930	2820	*
CGMN-SBC-D202-0-0060 (C0081175 Spk J, 400 ng/L Lab Spike)	400	3420	2900	*	400	2930	2810	*
CGMN-SBC-D202-0-0100 (C0081176 Spk K, 40 ng/L Lab Spike)	40	1180	1580	*	40	446	596	*
CGMN-SBC-D202-0-0100 (C0081176 Spk L, 400 ng/L Lab Spike)	400	1180	1660	120	400	446	840	99
CGMN-SBC-D202-0-0150 (C0081177 Spk C, 40 ng/L Lab Spike)	40	8840	5940	*	40	1600	1510	*
CGMN-SBC-D202-0-0150 (C0081177 Spk D, 400 ng/L Lab Spike)	400	6640	6200	*	400	1600	1820	*
CGMN-SBC-D202-0-0200 (C0081178 Spk E, 40 ng/L Lab Spike)	40	4500	4870	*	40	490	551	*
CGMN-SBC-D202-0-0200 (C0081178 Spk F, 400 ng/L Lab Spike)	400	4500	3910	*	400	490	661	40
CGMN-SBC-D202-0-0250 (C0081179 Spk G, 40 ng/L Lab Spike)	40	705	730	*	40	224	256	*
CGMN-SBC-D202-0-0260 (C0081179 Spk H, 400 ng/L Lab Spike)	400	705	1100	99	400	224	526	76
CGMN-SBC-D202-0-0300 (C0081180 Spk I, 40 ng/L Lab Spike)	40	737	824	*	40	796	984	*
CGMN-SBC-D202-0-0300 (C0081180 Spk J, 400 ng/L Lab Spike)	400	737	1020	71	400	796	1100	76
CGMN-SBC-D202-0-0350 (C0081181 Spk K, 40 ng/L Lab Spike)	40	77.6	99.2	54	40	433	436	*
CGMN-SBC-D202-0-0360 (C0081181 Spk L, 400 ng/L Lab Spike)	400	77.6	400	81	400	433	716	71

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D202-DB-0350 (C0001182 Spk C, 40 ng/L Lab Spike)	40	76.0	112	90	40	514	499	*
CGMN-SBC-D202-DB-0350 (C0001182 Spk D, 400 ng/L Lab Spike)	400	76.0	443	92	400	514	730	56
CGMN-SBC-D202-0-0400 (C0001183 Spk E, 40 ng/L Lab Spike)	40	193	205	*	40	960	856	*
CGMN-SBC-D202-0-0400 (C0001183 Spk F, 400 ng/L Lab Spike)	400	193	554	90	400	960	1270	78
CGMN-SBC-D202-0-0450 (C0001184 Spk G, 40 ng/L Lab Spike)	40	96.0	130	85	40	1020	1080	*
CGMN-SBC-D202-0-0450 (C0001184 Spk H, 400 ng/L Lab Spike)	400	96.0	485	97	400	1020	1430	103
CGMN-SBC-D201-0-0000 (C0001185 Spk I, 40 ng/L Lab Spike)	40	639	592	*	40	29.4	92.0	157
CGMN-SBC-D201-0-0000 (C0001185 Spk J, 400 ng/L Lab Spike)	400	639	840	50	400	29.4	356	82
CGMN-SBC-D201-0-0050 (C0001186 Spk K, 40 ng/L Lab Spike)	40	2190	2250	*	40	359	319	*
CGMN-SBC-D201-0-0050 (C0001186 Spk L, 400 ng/L Lab Spike)	400	2190	2440	*	400	359	537	45
CGMN-SBC-D201-0-0100 (C0001187 Spk C, 40 ng/L Lab Spike)	40	217	254	*	40	45.0	74.0	73
CGMN-SBC-D201-0-0100 (C0001187 Spk D, 400 ng/L Lab Spike)	400	217	569	88	400	45.0	399	89
CGMN-SBC-D201-DB-0100 (C0001188 Spk E, 40 ng/L Lab Spike)	40	258	259	*	40	51.4	79.0	69
CGMN-SBC-D201-DB-0100 (C0001188 Spk F, 400 ng/L Lab Spike)	400	258	547	72	400	51.4	369	79
CGMN-SBC-D201-0-0150 (C0001189 Spk G, 40 ng/L Lab Spike)	40	6440	6300	*	40	2900	2940	*
CGMN-SBC-D201-0-0150 (C0001189 Spk H, 400 ng/L Lab Spike)	400	6440	7350	*	400	2900	2480	*
CGMN-SBC-D201-0-0200 (C0001190 Spk I, 40 ng/L Lab Spike)	40	2140	1100	*	40	677	588	*
CGMN-SBC-D201-0-0200 (C0001190 Spk J, 400 ng/L Lab Spike)	400	2140	2180	*	400	677	1070	98
CGMN-SBC-D201-0-0250 (C0001191 Spk K, 40 ng/L Lab Spike)	40	635	619	*	40	580	546	*
CGMN-SBC-D201-0-0250 (C0001191 Spk L, 400 ng/L Lab Spike)	400	635	1280	161	400	580	788	52

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	C8 Sulfonate PFOS Amt Found in Sample (ng/g)	C8 Sulfonate PFOS Amount Recovered (ng/g)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found in Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	C8 Acid PFOA Recovery (%)
CGMN-SBC-D201-0-0300 (C0001182 Spk C, 40 ng/L Lab Spike)	40	319	343	*	40	570	572	*
CGMN-SBC-D201-0-0300 (C0001182 Spk D, 400 ng/L Lab Spike)	400	319	705	97	400	570	1020	113
CGMN-SBC-D201-0-0350 (C0001183 Spk E, 40 ng/L Lab Spike)	40	49.8	85.6	90	40	311	357	*
CGMN-SBC-D201-0-0350 (C0001183 Spk F, 400 ng/L Lab Spike)	400	49.8	396	87	400	311	609	75
CGMN-SBC-D201-0-0400 (C0001184 Spk G, 40 ng/L Lab Spike)	40	4.34	40.6	91	40	235	244	*
CGMN-SBC-D201-0-0400 (C0001184 Spk H, 400 ng/L Lab Spike)	400	4.34	356	88	400	235	520	130
CGMN-SBC-D104-0-0000 (C0001185 Spk I, 40 ng/L Lab Spike)	40	NR	NR	NR	40	NR	NR	NR
CGMN-SBC-D104-0-0000 (C0001185 Spk J, 400 ng/L Lab Spike)	400	NR	NR	NR	400	NR	NR	NR
CGMN-SBC-D104-0-0050 (C0001186 Spk K, 40 ng/L Lab Spike)	40	748	1620	*	40	221	282	*
CGMN-SBC-D104-0-0050 (C0001186 Spk L, 400 ng/L Lab Spike)	400	748	1180	109	400	221	421	50
CGMN-SBC-D104-DB-0050 (C0001187 Spk C, 40 ng/L Lab Spike)	40	686	732	*	40	206	233	*
CGMN-SBC-D104-DB-0050 (C0001187 Spk D, 400 ng/L Lab Spike)	400	686	840	39	400	206	545	85
CGMN-SBC-D104-0-0100 (C0001188 Spk E, 40 ng/L Lab Spike)	40	364	456	*	40	1330	1520	*
CGMN-SBC-D104-0-0100 (C0001188 Spk F, 400 ng/L Lab Spike)	400	364	796	108	400	1330	1920	*
CGMN-SBC-D104-0-0150 (C0001189 Spk G, 40 ng/L Lab Spike)	40	99.2	158	142	40	4110	4620	*
CGMN-SBC-D104-0-0150 (C0001189 Spk H, 400 ng/L Lab Spike)	400	99.2	450	88	400	4110	5010	*
CGMN-SBC-D104-0-0200 (C0001200 Spk I, 40 ng/L Lab Spike)	40	60.7	90.4	74	40	2070	2140	*
CGMN-SBC-D104-0-0200 (C0001200 Spk J, 400 ng/L Lab Spike)	400	60.7	414	88	400	2070	2580	*
CGMN-SBC-D104-0-0250 (C0001201 Spk K, 40 ng/L Lab Spike)	40	94.4	121	67	40	1740	2020	*
CGMN-SBC-D104-0-0250 (C0001201 Spk L, 400 ng/L Lab Spike)	400	94.4	436	85	400	1740	2780	*

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D104-0-0300 (C0081202 Spk C, 40 ng/L Lab Spike)	40	275	364	*	40	342	426	*
CGMN-SBC-D104-0-0300 (C0081202 Spk D, 400 ng/L Lab Spike)	400	275	710	109	400	342	717	94
CGMN-SBC-D104-0-0350 (C0081203 Spk E, 40 ng/L Lab Spike)	40	177	214	*	40	191	237	*
CGMN-SBC-D104-0-0350 (C0081203 Spk F, 400 ng/L Lab Spike)	400	177	542	91	400	191	546	89
CGMN-SBC-D104-0-0400 (C0081205 Spk G, 40 ng/L Lab Spike)	40	122	150	*	40	60.9	112	128
CGMN-SBC-D104-0-0400 (C0081205 Spk H, 400 ng/L Lab Spike)	400	122	458	84	400	60.9	430	92
CGMN-SBC-D104-0-0450 (C0081206 Spk I, 40 ng/L Lab Spike)	40	117	161	110	40	161	203	*
CGMN-SBC-D104-0-0450 (C0081206 Spk J, 400 ng/L Lab Spike)	400	117	487	88	400	161	498	84
CGMN-SBC-D104-DB-0450 (C0081207 Spk K, 40 ng/L Lab Spike)	40	125	150	*	40	156	178	55
CGMN-SBC-D104-DB-0450 (C0081207 Spk L, 400 ng/L Lab Spike)	400	125	482	89	400	156	498	85
CGMN-SBC-D104-0-0500 (C0081208 Spk C, 40 ng/L Lab Spike)	40	86.4	114	69	40	355	360	*
CGMN-SBC-D104-0-0500 (C0081208 Spk D, 400 ng/L Lab Spike)	400	86.4	454	92	400	355	714	90
CGMN-SBC-D104-0-0550 (C0081209 Spk E, 40 ng/L Lab Spike)	40	79.4	107	69	40	310	312	*
CGMN-SBC-D104-0-0550 (C0081209 Spk F, 400 ng/L Lab Spike)	400	79.4	474	99	400	310	633	81
CGMN-SBC-D104-0-0600 (C0081210 Spk G, 40 ng/L Lab Spike)	40	127	149	*	40	178	194	*
CGMN-SBC-D104-0-0600 (C0081210 Spk H, 400 ng/L Lab Spike)	400	127	411	84	400	178	483	76
CGMN-SBC-D104-0-0650 (C0081211 Spk I, 40 ng/L Lab Spike)	40	129	160	*	40	138	167	*
CGMN-SBC-D104-0-0650 (C0081211 Spk J, 400 ng/L Lab Spike)	400	129	412	66	400	138	446	77
CGMN-SBC-D103-0-0000 (C0081212 Spk K, 40 ng/L Lab Spike)	40	73.2	105	80	40	11.9	38.4	66
CGMN-SBC-D103-0-0000 (C0081212 Spk L, 400 ng/L Lab Spike)	400	73.2	318	81	400	11.9	318	77

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D103-0-0050 (C0081213 Spk C, 40 ng/L Lab Spike)	40	797	928	*	40	156	195	*
CGMN-SBC-D103-0-0050 (C0081213 Spk D, 400 ng/L Lab Spike)	400	797	1110	78	400	156	488	83
CGMN-SBC-D103-0-0100 (C0081214 Spk E, 40 ng/L Lab Spike)	40	864	787	*	40	581	585	*
CGMN-SBC-D103-0-0100 (C0081214 Spk F, 400 ng/L Lab Spike)	400	864	1220	89	400	581	1080	125
CGMN-SBC-D103-0-0150 (C0081215 Spk G, 40 ng/L Lab Spike)	40	215	242	*	40	2340	2210	*
CGMN-SBC-D103-0-0150 (C0081215 Spk H, 400 ng/L Lab Spike)	400	215	532	79	400	2340	2540	*
CGMN-SBC-D103-DB-0150 (C0081216 Spk I, 40 ng/L Lab Spike)	40	214	237	*	40	2310	2310	*
CGMN-SBC-D103-DB-0150 (C0081216 Spk J, 400 ng/L Lab Spike)	400	214	546	83	400	2310	2880	*
CGMN-SBC-D103-0-0200 (C0081217 Spk K, 40 ng/L Lab Spike)	40	544	589	*	40	1340	1510	*
CGMN-SBC-D103-0-0200 (C0081217 Spk L, 400 ng/L Lab Spike)	400	544	818	68	400	1340	1560	*
CGMN-SBC-D103-0-0250 (C0081219 Spk C, 40 ng/L Lab Spike)	40	297	147	*	40	NR	NR	NR
CGMN-SBC-D103-0-0250 (C0081219 Spk D, 400 ng/L Lab Spike)	400	297	693	99	400	NR	NR	NR
CGMN-SBC-D103-0-0300 (C0081220 Spk E, 40 ng/L Lab Spike)	40	210	283	*	40	142	201	*
CGMN-SBC-D103-0-0300 (C0081220 Spk F, 400 ng/L Lab Spike)	400	210	554	86	400	142	442	75
CGMN-SBC-D103-0-0350 (C0081221 Spk G, 40 ng/L Lab Spike)	40	322	371	*	40	61.4	104	107
CGMN-SBC-D103-0-0350 (C0081221 Spk H, 400 ng/L Lab Spike)	400	322	610	72	400	61.4	362	73
CGMN-SBC-D103-0-0400 (C0081222 Spk I, 40 ng/L Lab Spike)	40	350	370	*	40	110	138	70
CGMN-SBC-D103-0-0400 (C0081222 Spk J, 400 ng/L Lab Spike)	400	350	618	67	400	110	415	76
CGMN-SBC-D103-0-0450 (C0081238 Spk K, 40 ng/L Lab Spike)	40	190	238	*	40	81.8	118	91
CGMN-SBC-D103-0-0450 (C0081238 Spk L, 400 ng/L Lab Spike)	400	190	527	84	400	81.8	407	81

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D103-0-0500 (C0081238 Spk C, 40 ng/L Lab Spike)	40	171	221	*	40	52.1	103	127
CGMN-SBC-D103-0-0500 (C0081238 Spk D, 400 ng/L Lab Spike)	400	171	496	81	400	52.1	396	86
CGMN-SBC-D103-0-0550 (C0081239 Spk E, 40 ng/L Lab Spike)	40	112	150	95	40	154	192	*
CGMN-SBC-D103-0-0550 (C0081239 Spk F, 400 ng/L Lab Spike)	400	112	477	91	400	154	506	89
CGMN-SBC-D103-0-0600 (C0081240 Spk G, 40 ng/L Lab Spike)	40	184	209	*	40	158	192	*
CGMN-SBC-D103-0-0600 (C0081240 Spk H, 400 ng/L Lab Spike)	400	184	515	83	400	158	482	81
CGMN-SBC-D103-0-0650 (C0081241 Spk I, 40 ng/L Lab Spike)	40	244	314	*	40	160	222	*
CGMN-SBC-D103-0-0650 (C0081241 Spk J, 400 ng/L Lab Spike)	400	244	630	97	400	160	522	91
CGMN-SBC-D801-0-0000 (C0081248 Spk K, 40 ng/L Lab Spike)	40	482	702	*	40	136	169	*
CGMN-SBC-D801-0-0000 (C0081248 Spk L, 400 ng/L Lab Spike)	400	482	1100	155	400	136	437	75
CGMN-SBC-D801-0-0050 (C0081249 Spk C, 40 ng/L Lab Spike)	40	411	458	*	40	277	320	*
CGMN-SBC-D801-0-0050 (C0081249 Spk D, 400 ng/L Lab Spike)	400	411	750	87	400	277	588	78
CGMN-SBC-D801-0-0100 (C0081250 Spk E, 40 ng/L Lab Spike)	40	424	410	*	40	352	330	*
CGMN-SBC-D801-0-0100 (C0081250 Spk F, 400 ng/L Lab Spike)	400	424	649	56	400	352	562	53
CGMN-SBC-D801-0-0150 (C0081251 Spk G, 40 ng/L Lab Spike)	40	213	278	*	40	65.9	122	140
CGMN-SBC-D801-0-0150 (C0081251 Spk H, 400 ng/L Lab Spike)	400	213	578	91	400	65.9	430	93
CGMN-SBC-D801-0-0200 (C0081252 Spk I, 40 ng/L Lab Spike)	40	304	250	*	40	158	130	*
CGMN-SBC-D801-0-0200 (C0081252 Spk J, 400 ng/L Lab Spike)	400	304	617	78	400	158	470	78
CGMN-SBC-D101-0-0000 (C0081274 Spk K, 40 ng/L Lab Spike)	40	38.9	68.4	74	40	4.82	36.2	78
CGMN-SBC-D101-0-0000 (C0081274 Spk L, 400 ng/L Lab Spike)	400	38.9	361	81	400	4.82	328	80

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-D101-0-0050 (C0081275 Spk C, 40 ng/L Lab Spike)	40	41.0	74.7	84	40	52.4	86.8	83
CGMN-SBC-D101-0-0050 (C0081275 Spk D, 400 ng/L Lab Spike)	400	41.0	404	91	400	52.4	398	86
CGMN-SBC-D101-0-0100 (C0081277 Spk E, 40 ng/L Lab Spike)	40	61.7	104	106	40	171	209	*
CGMN-SBC-D101-0-0100 (C0081277 Spk F, 400 ng/L Lab Spike)	400	61.7	412	88	400	171	494	81
CGMN-SBC-D101-DB-0100 (C0081278 Spk G, 40 ng/L Lab Spike)	40	65.4	92.0	67	40	182	195	*
CGMN-SBC-D101-DB-0100 (C0081278 Spk H, 400 ng/L Lab Spike)	400	65.4	425	89	400	182	494	78
CGMN-SBC-D101-0-0150 (C0081279 Spk I, 40 ng/L Lab Spike)	40	66.7	96.0	76	40	24.5	58.1	79
CGMN-SBC-D101-0-0150 (C0081279 Spk J, 400 ng/L Lab Spike)	400	65.7	406	85	400	24.5	371	87
CGMN-SBC-D101-0-0200 (C0081280 Spk K, 40 ng/L Lab Spike)	40	37.2	65.3	70	40	18.9	51.9	83
CGMN-SBC-D101-0-0200 (C0081280 Spk L, 400 ng/L Lab Spike)	400	37.2	384	87	400	18.9	386	87
CGMN-SBC-D102-0-0000 (C0081281 Spk C, 40 ng/L Lab Spike)	40	NR	NR	NR	40	NR	NR	NR
CGMN-SBC-D102-0-0000 (C0081281 Spk D, 400 ng/L Lab Spike)	400	NR	NR	NR	400	NR	NR	NR
CGMN-SBC-D102-0-0050 (C0081282 Spk E, 40 ng/L Lab Spike)	40	353	386	*	40	696	706	*
CGMN-SBC-D102-0-0050 (C0081282 Spk F, 400 ng/L Lab Spike)	400	353	696	86	400	696	1050	88
CGMN-SBC-D102-0-0100 (C0081283 Spk G, 40 ng/L Lab Spike)	40	131	151	*	40	658	626	*
CGMN-SBC-D102-0-0100 (C0081283 Spk H, 400 ng/L Lab Spike)	400	131	457	82	400	658	1040	96
CGMN-SBC-D102-0-0150 (C0081284 Spk I, 40 ng/L Lab Spike)	40	33.8	65.8	80	40	114	138	60
CGMN-SBC-D102-0-0150 (C0081284 Spk J, 400 ng/L Lab Spike)	400	33.8	383	87	400	114	461	87
CGMN-SBC-D102-0-0200 (C0081285 Spk K, 40 ng/L Lab Spike)	40	248	259	*	40	128	153	*
CGMN-SBC-D102-0-0200 (C0081285 Spk L, 400 ng/L Lab Spike)	400	248	562	79	400	128	486	90

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight);

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-B1501-0-0000 (C0001342 Spk C, 40 ng/L Lab Spike)	40	550	610	*	40	NR	NR	NR
CGMN-SBC-B1501-0-0000 (C0001342 Spk D, 400 ng/L Lab Spike)	400	550	880	83	400	NR	NR	NR
CGMN-SBC-B1501-0-0050 (C0001343 Spk E, 40 ng/L Lab Spike)	40	160	200	*	40	162	186	*
CGMN-SBC-B1501-0-0050 (C0001343 Spk F, 400 ng/L Lab Spike)	400	160	471	78	400	162	487	78
CGMN-SBC-B1501-0-0100 (C0001344 Spk G, 40 ng/L Lab Spike)	40	98.2	123	60	40	161	198	*
CGMN-SBC-B1501-0-0100 (C0001344 Spk H, 400 ng/L Lab Spike)	400	99.2	428	82	400	181	486	71
CGMN-SBC-B1501-0-0150 (C0001345 Spk I, 40 ng/L Lab Spike)	40	NR	NR	NR	40	83.2	124	102
CGMN-SBC-B1501-0-0150 (C0001345 Spk J, 400 ng/L Lab Spike)	400	NR	NR	NR	400	83.2	406	81
CGMN-SBC-B1501-0-0200 (C0001346 Spk K, 40 ng/L Lab Spike)	40	1700	2090	*	40	74.4	134	149
CGMN-SBC-B1501-0-0200 (C0001346 Spk L, 400 ng/L Lab Spike)	400	1700	2040	*	400	74.4	418	85
CGMN-SBC-D501-0-0000 (C0001242 Spk C, 40 ng/L Lab Spike)	40	2160	1980	*	40	960	1010	*
CGMN-SBC-D501-0-0000 (C0001242 Spk D, 400 ng/L Lab Spike)	400	2160	2432	*	400	960	1650	173
CGMN-SBC-D501-0-0050 (C0001243 Spk E, 40 ng/L Lab Spike)	40	649	650	*	40	1120	1030	*
CGMN-SBC-D501-0-0050 (C0001243 Spk F, 400 ng/L Lab Spike)	400	649	1040	98	400	1120	1350	58
CGMN-SBC-D501-DB-0050 (C0001244 Spk G, 40 ng/L Lab Spike)	40	754	681	*	40	1080	960	*
CGMN-SBC-D501-DB-0050 (C0001244 Spk H, 400 ng/L Lab Spike)	400	754	978	56	400	1080	1250	44
CGMN-SBC-D501-0-0100 (C0001245 Spk I, 40 ng/L Lab Spike)	40	649	630	*	40	283	298	*
CGMN-SBC-D501-0-0100 (C0001245 Spk J, 400 ng/L Lab Spike)	400	649	1080	108	400	283	599	79
CGMN-SBC-D501-0-0150 (C0001246 Spk K, 40 ng/L Lab Spike)	40	44.7	72.0	68	40	39.5	74.6	88
CGMN-SBC-D501-0-0150 (C0001246 Spk L, 400 ng/L Lab Spike)	400	44.7	390	86	400	39.5	406	92

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	C8 Sulfonate PFOS Amt Found in Sample (ng/g)	C8 Sulfonate PFOS Amount Recovered (ng/g)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found in Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	C8 Acid PFOA Recovery (%)
CGMN-SBC-D501-0-0200 (C0001247 Spk C, 40 ng/L Lab Spike)	40	27.9	64.6	92	40	19.5	51.8	81
CGMN-SBC-D501-0-0200 (C0001247 Spk D, 400 ng/L Lab Spike)	400	27.9	338	78	400	19.5	350	83
CGMN-SBC-FTA02-0-0000 (C0001253 Spk E, 40 ng/L Lab Spike)	40	318	316	*	40	7.97	41.4	84
CGMN-SBC-FTA02-0-0000 (C0001253 Spk F, 400 ng/L Lab Spike)	400	318	534	54	400	7.97	312	76
CGMN-SBC-FTA02-0-0050 (C0001254 Spk G, 40 ng/L Lab Spike)	40	44.4	80.8	91	40	1.98	39.0	93
CGMN-SBC-FTA02-0-0050 (C0001254 Spk H, 400 ng/L Lab Spike)	400	44.4	374	82	400	1.98	346	86
CGMN-SBC-FTA02-DB-0100 (C0001255 Spk I, 40 ng/L Lab Spike)	40	10.9	44.0	83	40	1.52	37.7	90
CGMN-SBC-FTA02-DB-0100 (C0001255 Spk J, 400 ng/L Lab Spike)	400	10.9	359	87	400	1.52	353	88
CGMN-SBC-FTA02-0-0100 (C0001256 Spk K, 40 ng/L Lab Spike)	40	11.9	51.4	99	40	1.76	43.4	104
CGMN-SBC-FTA02-0-0100 (C0001256 Spk L, 400 ng/L Lab Spike)	400	11.9	364	88	400	1.76	362	90
CGMN-SBC-FTA02-0-0150 (C0001257 Spk C, 40 ng/L Lab Spike)	40	16.9	52.9	90	40	3.76	41.4	94
CGMN-SBC-FTA02-0-0150 (C0001257 Spk D, 400 ng/L Lab Spike)	400	16.9	343	82	400	3.76	343	85
CGMN-SBC-FTA02-0-0200 (C0001258 Spk E, 40 ng/L Lab Spike)	40	15.4	48.7	83	40	4.94	40.6	89
CGMN-SBC-FTA02-0-0200 (C0001258 Spk F, 400 ng/L Lab Spike)	400	15.4	349	83	400	4.94	326	80
CGMN-SBC-FTA03-0-0000 (C0001259 Spk G, 40 ng/L Lab Spike)	40	730	666	*	40	361	342	*
CGMN-SBC-FTA03-0-0000 (C0001259 Spk H, 400 ng/L Lab Spike)	400	730	866	57	400	361	662	73
CGMN-SBC-FTA03-0-0100 (C0001260 Spk I, 40 ng/L Lab Spike)	40	12.0	54.6	106	40	56.5	98.4	105
CGMN-SBC-FTA03-0-0100 (C0001260 Spk J, 400 ng/L Lab Spike)	400	12.0	375	91	400	56.5	399	86
CGMN-SBC-FTA03-0-0100 (C0001262 Spk K, 40 ng/L Lab Spike)	40	1.74	40.2	96	40	14.4	54.0	99
CGMN-SBC-FTA03-0-0100 (C0001262 Spk L, 400 ng/L Lab Spike)	400	1.74	354	88	400	14.4	364	87

*Sample residue exceeds the spiking level significantly (5x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	C8 Sulfonate PFOS Amt Found in Sample (ng/g)	C8 Sulfonate PFOS Amount Recovered (ng/g)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found in Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	C8 Acid PFOA Recovery (%)
CGMN-SBC-FTA03-0-0150 (C0001263 Spk C, 40 ng/L Lab Spike)	40	1.21	34.7	84	40	4.50	37.8	83
CGMN-SBC-FTA03-0-0150 (C0001263 Spk D, 400 ng/L Lab Spike)	400	1.21	331	82	400	4.50	348	85
CGMN-SBC-FTA03-0-0200 (C0001264 Spk E, 40 ng/L Lab Spike)	40	1.48	34.4	82	40	130	202	*
CGMN-SBC-FTA03-0-0200 (C0001264 Spk F, 400 ng/L Lab Spike)	400	1.48	321	80	400	130	423	73
CGMN-SBC-FTA01-0-0000 (C0001269 Spk G, 40 ng/L Lab Spike)	40	NR	NR	NR	40	154	139	*
CGMN-SBC-FTA01-0-0000 (C0001269 Spk H, 400 ng/L Lab Spike)	400	NR	NR	NR	400	154	414	65
CGMN-SBC-FTA01-0-0050 (C0001270 Spk I, 40 ng/L Lab Spike)	40	72.6	101	71	40	43.4	72.8	73
CGMN-SBC-FTA01-0-0050 (C0001270 Spk J, 400 ng/L Lab Spike)	400	72.6	398	81	400	43.4	390	87
CGMN-SBC-FTA01-0-0100 (C0001271 Spk K, 40 ng/L Lab Spike)	40	20.4	53.4	83	40	16.0	46.9	77
CGMN-SBC-FTA01-0-0100 (C0001271 Spk L, 400 ng/L Lab Spike)	400	20.4	353	83	400	16.0	344	82
CGMN-SBC-FTA01-0-0150 (C0001272 Spk C, 40 ng/L Lab Spike)	40	22.5	57.4	87	40	33.5	83.2	124
CGMN-SBC-FTA01-0-0150 (C0001272 Spk D, 400 ng/L Lab Spike)	400	22.5	356	83	400	33.6	385	88
CGMN-SBC-FTA01-0-0200 (C0001273 Spk E, 40 ng/L Lab Spike)	40	80.0	102	56	40	NR	NR	NR
CGMN-SBC-FTA01-0-0200 (C0001273 Spk F, 400 ng/L Lab Spike)	400	80.0	371	73	400	NR	NR	NR
CGMN-SBC-WPA01-0-0000 (C0001329 Spk G, 40 ng/L Lab Spike)	40	110	118	13	40	27.8	53.2	64
CGMN-SBC-WPA01-0-0000 (C0001329 Spk H, 400 ng/L Lab Spike)	400	110	365	61	400	27.8	319	73
CGMN-SBC-WPA01-0-0050 (C0001330 Spk I, 40 ng/L Lab Spike)	40	36.6	60.3	59	40	16.8	48.1	78
CGMN-SBC-WPA01-0-0050 (C0001330 Spk J, 400 ng/L Lab Spike)	400	36.6	370	83	400	16.8	374	89
CGMN-SBC-WPA01-0-0100 (C0001331 Spk K, 40 ng/L Lab Spike)	40	57.6	78.2	52	40	19.6	52.2	82
CGMN-SBC-WPA01-0-0100 (C0001331 Spk L, 400 ng/L Lab Spike)	400	57.6	418	90	400	19.5	406	97

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SBC-WPA01-DB-0100 (C0001332 Spk C, 40 ng/L Lab Spike)	40	44.2	94.4	126	40	12.7	48.1	89
CGMN-SBC-WPA01-DB-0100 (C0001332 Spk D, 400 ng/L Lab Spike)	400	44.2	383	85	400	12.7	347	84
CGMN-SBC-WPA01-0-0150 (C0001333 Spk E, 40 ng/L Lab Spike)	40	702	620	*	40	24.2	52.7	71
CGMN-SBC-WPA01-0-0150 (C0001333 Spk F, 400 ng/L Lab Spike)	400	702	968	67	400	24.2	323	75
CGMN-SBC-WPA01-0-0200 (C0001334 Spk G, 40 ng/L Lab Spike)	40	NR	NR	NR	40	NR	NR	NR
CGMN-SBC-WPA01-0-0200 (C0001334 Spk H, 400 ng/L Lab Spike)	400	NR	NR	NR	400	NR	NR	NR
CGMN-SBC-BKG01-0-0000 (C0001335 Spk I, 40 ng/L Lab Spike)	40	0.576	39.3	97	40	0.494	31.4	77
CGMN-SBC-BKG01-0-0000 (C0001335 Spk J, 400 ng/L Lab Spike)	400	0.576	354	88	400	0.494	310	77
CGMN-SBC-BKG01-0-0050 (C0001336 Spk K, 40 ng/L Lab Spike)	40	NQ	34.2	86	40	0.731	32.9	80
CGMN-SBC-BKG01-0-0050 (C0001336 Spk L, 400 ng/L Lab Spike)	400	NQ	340	85	400	0.731	318	79
CGMN-SBC-BKG01-0-0100 (C0001338 Spk C, 40 ng/L Lab Spike)	40	ND	35.4	89	40	0.470	35.9	89
CGMN-SBC-BKG01-0-0100 (C0001338 Spk D, 400 ng/L Lab Spike)	400	ND	310	78	400	0.470	322	80
CGMN-SBC-BKG01-DB-0100 (C0001339 Spk E, 40 ng/L Lab Spike)	40	ND	32.6	82	40	0.598	32.5	80
CGMN-SBC-BKG01-DB-0100 (C0001339 Spk F, 400 ng/L Lab Spike)	400	ND	327	82	400	0.598	334	83
CGMN-SBC-BKG01-0-0150 (C0001340 Spk G, 40 ng/L Lab Spike)	40	ND	34.3	86	40	NQ	34.1	85
CGMN-SBC-BKG01-0-0150 (C0001340 Spk H, 400 ng/L Lab Spike)	400	ND	339	85	400	NQ	348	87
CGMN-SBC-BKG01-0-0200 (C0001341 Spk I, 40 ng/L Lab Spike)	40	NQ	35.4	89	40	0.848	36.0	88
CGMN-SBC-BKG01-0-0200 (C0001341 Spk J, 400 ng/L Lab Spike)	400	NQ	350	88	400	0.848	356	89
CGMN-SBC-BKG02-0-0000 (C0001347 Spk K, 40 ng/L Lab Spike)	40	1.90	34.7	82	40	NQ	34.8	87
CGMN-SBC-BKG02-0-0000 (C0001347 Spk L, 400 ng/L Lab Spike)	400	1.90	340	85	400	NQ	318	80

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	C8 Sulfonate PFOS Amt Found In Sample (ng/g)	C8 Sulfonate PFOS Amount Recovered (ng/g)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found In Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	C8 Acid PFOA Recovery (%)
CGMN-SBC-BKG02-0-0050 (C0081348 Spk C, 40 ng/L Lab Spike)	40	NQ	34.0	85	40	NQ	34.1	85
CGMN-SBC-BKG02-0-0050 (C0081348 Spk D, 400 ng/L Lab Spike)	400	NQ	312	78	400	NQ	319	80
CGMN-SBC-BKG02-DB-0100 (C0081349 Spk E, 40 ng/L Lab Spike)	40	ND	34.5	86	40	NQ	35.7	89
CGMN-SBC-BKG02-DB-0100 (C0081349 Spk F, 400 ng/L Lab Spike)	400	ND	334	84	400	NQ	345	86
CGMN-SBC-BKG02-0-0100 (C0081350 Spk G, 40 ng/L Lab Spike)	40	ND	33.8	85	40	NQ	34.9	87
CGMN-SBC-BKG02-0-0100 (C0081350 Spk H, 400 ng/L Lab Spike)	400	ND	330	83	400	NQ	330	83
CGMN-SBC-BKG02-0-0150 (C0081351 Spk I, 40 ng/L Lab Spike)	40	ND	35.8	90	40	0.589	35.5	87
CGMN-SBC-BKG02-0-0150 (C0081351 Spk J, 400 ng/L Lab Spike)	400	ND	326	82	400	0.589	319	80
CGMN-SBC-BKG02-0-0200 (C0081352 Spk K, 40 ng/L Lab Spike)	40	ND	34.0	85	40	0.688	35.9	88
CGMN-SBC-BKG02-0-0200 (C0081352 Spk L, 400 ng/L Lab Spike)	400	ND	316	79	400	0.688	337	84
CGMN-SS-BKG01-0-0000 (C0081353 Spk C, 40 ng/L Lab Spike)	40	13.0	43.5	76	40	2.77	35.3	81
CGMN-SS-BKG01-0-0000 (C0081353 Spk D, 400 ng/L Lab Spike)	400	13.0	292	70	400	2.77	306	76
CGMN-SS-BKG01-0-0005 (C0081354 Spk E, 40 ng/L Lab Spike)	40	7.29	39.9	82	40	3.05	36.3	83
CGMN-SS-BKG01-0-0005 (C0081354 Spk F, 400 ng/L Lab Spike)	400	7.29	330	81	400	3.05	328	81
CGMN-SS-D601-0-0000 (C0081355 Spk G, 40 ng/L Lab Spike)	40	38.2	65.4	68	40	13.0	41.0	103
CGMN-SS-D601-0-0000 (C0081355 Spk H, 400 ng/L Lab Spike)	400	38.2	278	60	400	13.0	268	67
CGMN-SS-D601-0-0005 (C0081356 Spk I, 40 ng/L Lab Spike)	40	33.1	67.0	85	40	21.5	45.1	62
CGMN-SS-D601-0-0005 (C0081356 Spk J, 400 ng/L Lab Spike)	400	33.1	312	70	400	21.5	304	71
CGMN-SS-D601-DB-0005 (C0081357 Spk K, 40 ng/L Lab Spike)	40	33.8	51.9	63	40	24.9	50.2	128
CGMN-SS-D601-DB-0005 (C0081357 Spk L, 400 ng/L Lab Spike)	400	33.8	316	71	400	24.9	307	77

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-B10201-0-0000 (C0001365 Spk C, 40 ng/L Lab Spike)	40	25.8	51.7	65	40	1.75	34.6	82
CGMN-SS-B10201-0-0000 (C0001365 Spk D, 400 ng/L Lab Spike)	400	25.8	342	79	400	1.75	366	91
CGMN-SS-B10201-0-0005 (C0001366 Spk E, 40 ng/L Lab Spike)	40	71.0	97.6	67	40	1.22	35.1	85
CGMN-SS-B10201-0-0005 (C0001366 Spk F, 400 ng/L Lab Spike)	400	71.0	435	91	400	1.22	354	88
CGMN-SS-B2201-0-0000 (C0001367 Spk G, 40 ng/L Lab Spike)	40	2.22	37.7	89	40	0.754	37.3	91
CGMN-SS-B2201-0-0000 (C0001367 Spk H, 400 ng/L Lab Spike)	400	2.22	373	93	400	0.754	374	93
CGMN-SS-B2201-0-0005 (C0001368 Spk I, 40 ng/L Lab Spike)	40	16.2	57.8	104	40	1.49	40.3	97
CGMN-SS-B2201-0-0005 (C0001368 Spk J, 400 ng/L Lab Spike)	400	16.2	390	93	400	1.49	377	94
CGMN-SS-B2201-DB-0005 (C0001369 Spk K, 40 ng/L Lab Spike)	40	15.5	48.8	83	40	1.79	37.2	89
CGMN-SS-B2201-DB-0005 (C0001369 Spk L, 400 ng/L Lab Spike)	400	15.5	375	90	400	1.79	378	94
CGMN-SS-B2501-0-0000 (C0001370 Spk C, 40 ng/L Lab Spike)	40	473	546	*	40	50.6	97.6	118
CGMN-SS-B2501-0-0000 (C0001370 Spk D, 400 ng/L Lab Spike)	400	473	920	112	400	50.6	436	96
CGMN-SS-B2501-0-0005 (C0001371 Spk E, 40 ng/L Lab Spike)	40	91.2	139	120	40	37.0	75.9	97
CGMN-SS-B2501-0-0005 (C0001371 Spk F, 400 ng/L Lab Spike)	400	91.2	458	92	400	37.0	386	87
CGMN-SS-B2601-0-0000 (C0001372 Spk G, 40 ng/L Lab Spike)	40	67.3	101	84	40	10.2	48.0	95
CGMN-SS-B2601-0-0000 (C0001372 Spk H, 400 ng/L Lab Spike)	400	67.3	451	96	400	10.2	417	102
CGMN-SS-B2601-0-0005 (C0001373 Spk I, 40 ng/L Lab Spike)	40	418	334	*	40	17.7	50.2	81
CGMN-SS-B2601-0-0005 (C0001373 Spk J, 400 ng/L Lab Spike)	400	418	770	88	400	17.7	385	92
CGMN-SS-B1602-0-0000 (C0001375 Spk K, 40 ng/L Lab Spike)	40	149	182	*	40	4.52	36.1	79
CGMN-SS-B1602-0-0000 (C0001375 Spk L, 400 ng/L Lab Spike)	400	149	498	87	400	4.52	338	83

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	C8 Sulfonate PFOS Amt Found in Sample (ng/g)	C8 Sulfonate PFOS Amount Recovered (ng/g)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found in Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	C8 Acid PFOA Recovery (%)
CGMN-SS-B1602-0-0005 (C0081376 Spk C, 40 ng/L Lab Spike)	40	262	294	*	40	72.7	112	98
CGMN-SS-B1602-0-0005 (C0081376 Spk D, 400 ng/L Lab Spike)	400	262	568	82	400	72.7	418	86
CGMN-SS-B11201-0-0000 (C0081377 Spk E, 40 ng/L Lab Spike)	40	52.7	76.8	60	40	6.48	39.0	81
CGMN-SS-B11201-0-0000 (C0081377 Spk F, 400 ng/L Lab Spike)	400	52.7	370	79	400	6.48	326	80
CGMN-SS-B11201-0-0005 (C0081378 Spk G, 40 ng/L Lab Spike)	40	13.1	41.3	71	40	2.82	35.6	82
CGMN-SS-B11201-0-0005 (C0081378 Spk H, 400 ng/L Lab Spike)	400	13.1	362	87	400	2.82	350	87
CGMN-SS-FTA01-0-0000 (C0081379 Spk I, 40 ng/L Lab Spike)	40	32.4	59.4	68	40	3.31	32.8	74
CGMN-SS-FTA01-0-0000 (C0081379 Spk J, 400 ng/L Lab Spike)	400	32.4	321	72	400	3.31	288	71
CGMN-SS-FTA01-0-0005 (C0081380 Spk K, 40 ng/L Lab Spike)	40	28.2	63.0	87	40	1.98	34.0	80
CGMN-SS-FTA01-0-0005 (C0081380 Spk L, 400 ng/L Lab Spike)	400	28.2	376	87	400	1.98	331	82
CGMN-SS-FTA01-DB-0005 (C0081381 Spk C, 40 ng/L Lab Spike)	40	27.7	64.3	92	40	2.10	37.4	88
CGMN-SS-FTA01-DB-0005 (C0081381 Spk D, 400 ng/L Lab Spike)	400	27.7	406	95	400	2.10	336	83
CGMN-SS-FTA02-0-0000 (C0081382 Spk E, 40 ng/L Lab Spike)	40	1440	1470	*	40	69.4	110	102
CGMN-SS-FTA02-0-0000 (C0081382 Spk F, 400 ng/L Lab Spike)	400	1440	1620	*	400	69.4	338	67
CGMN-SS-FTA02-0-0005 (C0081383 Spk G, 40 ng/L Lab Spike)	40	341	373	*	40	18.5	46.4	70
CGMN-SS-FTA02-0-0005 (C0081383 Spk H, 400 ng/L Lab Spike)	400	341	600	65	400	18.5	328	77
CGMN-SS-B6801-0-0000 (C0081385 Spk I, 40 ng/L Lab Spike)	40	832	872	*	40	157	220	*
CGMN-SS-B6801-0-0000 (C0081386 Spk J, 400 ng/L Lab Spike)	400	832	1210	95	400	157	457	75
CGMN-SS-B6801-DB-0000 (C0081386 Spk K, 40 ng/L Lab Spike)	40	749	1000	*	40	126	190	*
CGMN-SS-B6801-DB-0000 (C0081386 Spk L, 400 ng/L Lab Spike)	400	749	1160	103	400	126	560	109

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-B6801-0-0005 (C0081387 Spk C, 40 ng/L Lab Spike)	40	502	524	*	40	29.7	69.8	100
CGMN-SS-B6801-0-0005 (C0081387 Spk D, 400 ng/L Lab Spike)	400	502	912	103	400	29.7	386	89
CGMN-SS-B1601-0-0000 (C0081382 Spk E, 40 ng/L Lab Spike)	40	2.46	42.0	99	40	1.58	43.0	104
CGMN-SS-B1601-0-0000 (C0081382 Spk F, 400 ng/L Lab Spike)	400	2.46	397	99	400	1.58	399	99
CGMN-SS-B1601-0-0005 (C0081383 Spk G, 40 ng/L Lab Spike)	40	167	195	*	40	10.0	48.0	95
CGMN-SS-B1601-0-0005 (C0081383 Spk H, 400 ng/L Lab Spike)	400	167	503	84	400	10.0	356	87
CGMN-SS-IC04-0-0000 (C0081385 Spk I, 40 ng/L Lab Spike)	40	7.10	42.6	89	40	1.10	33.8	81
CGMN-SS-IC04-0-0000 (C0081385 Spk J, 400 ng/L Lab Spike)	400	7.10	350	86	400	1.10	347	86
CGMN-SS-IC04-0-0005 (C0081386 Spk K, 40 ng/L Lab Spike)	40	19.4	53.5	85	40	2.06	34.2	80
CGMN-SS-IC04-0-0005 (C0081386 Spk L, 400 ng/L Lab Spike)	400	19.4	375	89	400	2.06	338	84
CGMN-SS-IC03-0-0000 (C0081387 Spk C, 40 ng/L Lab Spike)	40	1.06	38.4	93	40	1.33	40.2	97
CGMN-SS-IC03-0-0000 (C0081387 Spk D, 400 ng/L Lab Spike)	400	1.06	344	86	400	1.33	349	87
CGMN-SS-IC03-0-0005 (C0081398 Spk E, 40 ng/L Lab Spike)	40	1.34	31.7	76	40	4.53	36.8	81
CGMN-SS-IC03-0-0005 (C0081398 Spk F, 400 ng/L Lab Spike)	400	1.34	297	74	400	4.53	326	80
CGMN-SS-IC01-0-0000 (C0081399 Spk G, 40 ng/L Lab Spike)	40	27.4	56.6	73	40	1.12	38.4	93
CGMN-SS-IC01-0-0000 (C0081399 Spk H, 400 ng/L Lab Spike)	400	27.4	357	82	400	1.12	382	95
CGMN-SS-IC01-0-0005 (C0081400 Spk I, 40 ng/L Lab Spike)	40	46.1	70.7	62	40	1.89	34.6	82
CGMN-SS-IC01-0-0005 (C0081400 Spk J, 400 ng/L Lab Spike)	400	46.1	322	69	400	1.89	298	74
CGMN-SS-IC02-0-0000 (C0081401 Spk K, 40 ng/L Lab Spike)	40	7.35	42.5	88	40	1.51	34.3	82
CGMN-SS-IC02-0-0000 (C0081401 Spk L, 400 ng/L Lab Spike)	400	7.35	334	82	400	1.51	338	84

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight);

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFOS and PFOA in Soil Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-SS-IC02-0-0005 (C0081402 Spk C, 40 ng/L Lab Spike)	40	5.98	41.3	88	40	0.800	35.8	88
CGMN-SS-IC02-0-0005 (C0081402 Spk D, 400 ng/L Lab Spike)	400	5.98	415	102	400	0.800	394	98
CGMN-SS-D503-0-0000 (C0081403 Spk E, 40 ng/L Lab Spike)	40	40.4	78.7	96	40	8.72	49.1	101
CGMN-SS-D503-0-0000 (C0081403 Spk F, 400 ng/L Lab Spike)	400	40.4	380	85	400	8.72	354	86
CGMN-SS-D503-0-0005 (C0081404 Spk G, 40 ng/L Lab Spike)	40	17.0	56.0	98	40	1.79	38.8	93
CGMN-SS-D503-0-0005 (C0081404 Spk H, 400 ng/L Lab Spike)	400	17.0	390	93	400	1.79	381	95
CGMN-SS-D501-0-0000 (C0081405 Spk I, 40 ng/L Lab Spike)	40	115	169	135	40	8.96	42.6	84
CGMN-SS-D501-0-0000 (C0081405 Spk J, 400 ng/L Lab Spike)	400	115	434	80	400	8.96	323	79
CGMN-SS-D601-0-0005 (C0081406 Spk K, 40 ng/L Lab Spike)	40	72.2	118	115	40	6.16	48.4	106
CGMN-SS-D601-0-0005 (C0081406 Spk L, 400 ng/L Lab Spike)	400	72.2	403	83	400	6.16	349	86
CGMN-SS-B801-0-0000 (C0081407 Spk C, 40 ng/L Lab Spike)	40	438	606	*	40	6.71	40.3	84
CGMN-SS-B801-0-0000 (C0081407 Spk D, 400 ng/L Lab Spike)	400	438	739	75	400	6.71	302	74
CGMN-SS-B801-0-0005 (C0081408 Spk E, 40 ng/L Lab Spike)	40	888	912	*	40	35.5	56.7	53
CGMN-SS-B801-0-0005 (C0081408 Spk F, 400 ng/L Lab Spike)	400	888	1510	156	400	35.5	344	77
CGMN-SS-D602-0-0000 (C0081409 Spk G, 40 ng/L Lab Spike)	40	61.6	110	121	40	3.90	36.8	82
CGMN-SS-D602-0-0000 (C0081409 Spk H, 400 ng/L Lab Spike)	400	61.6	436	94	400	3.90	320	79
CGMN-SS-D502-0-0005 (C0081410 Spk I, 40 ng/L Lab Spike)	40	383	452	*	40	11.9	46.3	86
CGMN-SS-D502-0-0005 (C0081410 Spk J, 400 ng/L Lab Spike)	400	383	795	103	400	11.9	351	85
			Average:	85			Average:	88
			Standard Deviation:	19			Standard Deviation:	17

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

NC = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VI. Matrix Spike Recovery of PFBS and PFHS in Ground Water Samples

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	C4 Sulfonate PFBS Amt Found in Sample (ng/L)	C4 Sulfonate PFBS Amount Recovered (ng/L)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	C6 Sulfonate PFHS Amt Found in Sample (ng/L)	C6 Sulfonate PFHS Amount Recovered (ng/L)	C6 Sulfonate PFHS Recovery (%)
CGMN-GW-PW7-0-050516 (C0001234 Spk C, 1000 ng/L Lab Spike)	1000	ND	928	93	1000	ND	917	92
CGMN-GW-PW7-0-050516 (C0001234 Spk D, 5000 ng/L Lab Spike)	5000	ND	4620	92	5000	ND	4560	91
CGMN-GW-PW7-LS-050516 Low Spike 1 ppb (C0001236, 1000 ng/L Field Spike)	1000	ND	938	94	1000	ND	1060	106
CGMN-GW-PW7-HS-050516 High Spike 5 ppb (C0001237, 5000 ng/L Field Spike)	5000	ND	5740	115	5000	ND	5890	118
CGMN-GW-MW8-0-050516 (C0001228 Spk E, 100 ng/L Lab Spike)	100	80.2	188	108	100	186	310	128
CGMN-GW-MW8-0-050516 (C0001228 Spk F, 500 ng/L Lab Spike)	500	80.2	573	103	500	186	703	104
CGMN-GW-MW8-LS-050516 Low Spike 0.1 ppb (C0001230, 100 ng/L Field Spike)	100	80.2	185	106	100	186	327	142
CGMN-GW-MW8-HS-050516 High Spike 0.5 ppb (C0001231, 500 ng/L Field Spike)	500	80.2	569	100	500	186	687	100
CGMN-GW-MW19-0-050517 (C0001232 Spk G, 500 ng/L Lab Spike)	500	NR	NR	NR	500	NR	NR	NR
CGMN-GW-MW19-0-050517 (C0001232 Spk H, 1000 ng/L Lab Spike)	1000	NR	NR	NR	1000	NR	NR	NR
CGMN-GW-MW19-LS-050517 Low Spike 0.5 ppb (C0001234, 500 ng/L Field Spike)	500	NR	NR	NR	500	NR	NR	NR
CGMN-GW-MW19-HS-050517 High Spike 1.0 ppb (C0001235, 1000 ng/L Field Spike)	1000	NR	NR	NR	1000	NR	NR	NR
CGMN-GW-DECON-0-050524 (C0001265 Spk C, 100 ng/L Lab Spike)	100	ND	110	110	100	ND	113	113
CGMN-GW-DECON-0-050524 (C0001265 Spk D, 5000 ng/L Lab Spike)	5000	ND	5120	102	5000	ND	5120	102
CGMN-GW-DECON-LS-050524 Low Spike 0.1 ppb (C0001267, 100 ng/L Field Spike)	100	ND	101	101	100	ND	109	109
CGMN-GW-DECON-HS-050524 High Spike 5.0 ppb (C0001268, 5000 ng/L Field Spike)	5000	ND	5010	100	5000	ND	5060	101
WBMN-GW-R1-0-050612 (C0001411 Spk E, 1000 ng/L Lab Spike)	1000	1680	2870	119	1000	2070	3430	136
WBMN-GW-R1-0-050612 (C0001411 Spk F, 10000 ng/L Lab Spike)	10000	1680	12100	104	10000	2070	12700	106
WBMN-GW-R1-LS-050612 Low Spike 1.0 ppb (C0001412, 1000 ng/L Field Spike)	1000	1680	2860	117	1000	2070	3420	135
WBMN-GW-R1-HS-050612 High Spike 10 ppb (C0001414, 10000 ng/L Field Spike)	10000	1680	11600	99	10000	2070	13000	109
WBMN-GW-R2-0-050612 (C0001416 Spk C, 1000 ng/L Lab Spike)	1000	ND	900	90	1000	ND	899	90
WBMN-GW-R2-0-050612 (C0001416 Spk D, 10000 ng/L Lab Spike)	10000	ND	10000	100	10000	ND	9660	97
WBMN-GW-R2-LS-050612 Low Spike 1.0 ppb (C0001418, 1000 ng/L Field Spike)	1000	ND	947	95	1000	ND	1060	106
WBMN-GW-R2-HS-050612 High Spike 10 ppb (C0001419, 10000 ng/L Field Spike)	10000	ND	8790	88	10000	ND	9300	93

*Sample residue exceeds the spiking level significantly (>3x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VI. Matrix Spike Recovery of PFBS and PFHS in Ground Water Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	C4 Sulfonate PFBS Amt Found in Sample (ng/L)	C4 Sulfonate PFBS Amount Recovered (ng/L)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	C6 Sulfonate PFHS Amt Found in Sample (ng/L)	C6 Sulfonate PFHS Amount Recovered (ng/L)	C6 Sulfonate PFHS Recovery (%)
WBMN-GW-R3-0-050512 ([illegible] Spk E, 1000 ng/L Lab Spike)	1000	355	1260	91	1000	1040	2000	96
WBMN-GW-R3-0-050512 ([illegible] Spk F, 10000 ng/L Lab Spike)	10000	355	9190	88	10000	1040	9810	88
WBMN-GW-R3-LS-050512 Low Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	355	1290	94	1000	1040	2290	126
WBMN-GW-R3-HS-050512 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	355	10800	99	10000	1040	10600	96
WBMN-GW-R4-0-050512 ([illegible] Spk G, 10000 ng/L Lab Spike)	10000	5410	14600	92	10000	22100	28700	66
WBMN-GW-R4-0-050512 ([illegible] Spk G, 100000 ng/L Lab Spike)	100000	5410	86300	81	100000	22100	100000	78
WBMN-GW-R4-LS-050512 Low Spike 1.0 ppb ([illegible], 10000 ng/L Field Spike)	10000	6410	14800	94	10000	22100	31800	97
WBMN-GW-R4-HS-050512 High Spike 100 ppb ([illegible], 100000 ng/L Field Spike)	100000	6410	99400	94	100000	22100	122000	100
WBMN-GW-CWM-0-050512 ([illegible] Spk C, 1000 ng/L Lab Spike)	1000	3540	4300	*	1000	10200	10900	*
WBMN-GW-CWM-0-050512 ([illegible] Spk D, 10000 ng/L Lab Spike)	10000	3540	12900	94	10000	10200	20100	99
WBMN-GW-CWM-LS-050512 Low Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	3540	4380	*	1000	10200	11000	*
WBMN-GW-CWM-HS-050512 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	3540	13200	97	10000	10200	22000	118
WBMN-GW-CWD01-0-050512 ([illegible] Spk E, 1000 ng/L Lab Spike)	1000	3360	4100	*	1000	7420	9070	*
WBMN-GW-CWD01-0-050512 ([illegible] Spk F, 10000 ng/L Lab Spike)	10000	3360	11700	83	10000	7420	16000	86
WBMN-GW-CWD01-LS-050512 Low Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	3360	3760	*	1000	7420	7510	*
WBMN-GW-CWD01-HS-050512 High Spike 10 ppb ([illegible], 10000 ng/L Field Spike)	10000	3360	10800	74	10000	7420	13900	65
WBMN-GW-TRIP-LS-050511 Low Spike 0.1 ppb ([illegible], 100 ng/L Trip Spike)	100	ND	105	105	100	ND	109	109
WBMN-GW-TRIP-HS-050511 High Spike 1.0 ppb ([illegible], 1000 ng/L Trip Spike)	1000	ND	903	90	1000	ND	900	90
			Average:	97			Average:	103
			Standard Deviation:	10			Standard Deviation:	18

*Sample residue exceeds the spiking level significantly (>3x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VII. Matrix Spike Recovery of PFOS and PFOA in Ground Water Samples

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-GW-PW7-0-050516 (C0001224 Spk C, 1000 ng/L Lab Spike)	1000	ND	869	89	1000	332	1210	88
CGMN-GW-PW7-0-050516 (C0001224 Spk D, 5000 ng/L Lab Spike)	5000	ND	4040	81	5000	332	4700	87
CGMN-GW-PW7-LS-050516 Low Spike 1 ppb (C0001226, 1000 ng/L Field Spike)	1000	ND	1040	104	1000	332	1360	103
CGMN-GW-PW7-HS-050516 High Spike 5 ppb (C0001227, 5000 ng/L Field Spike)	5000	ND	5890	118	5000	332	6050	121
CGMN-GW-MW8-0-050516 (C0001228 Spk E, 100 ng/L Lab Spike)	100	593	720	*	100	959	969	*
CGMN-GW-MW8-0-050516 (C0001228 Spk F, 500 ng/L Lab Spike)	500	593	961	74	500	959	1280	64
CGMN-GW-MW8-LS-050516 Low Spike 0.1 ppb (C0001230, 100 ng/L Field Spike)	100	593	789	*	100	959	1120	*
CGMN-GW-MW8-HS-050516 High Spike 0.5 ppb (C0001231, 500 ng/L Field Spike)	500	593	1020	85	500	959	1370	82
CGMN-GW-MW19-0-050517 (C0001232 Spk G, 500 ng/L Lab Spike)	500	59.7	412	70	500	NR	NR	NR
CGMN-GW-MW19-0-050517 (C0001232 Spk H, 1000 ng/L Lab Spike)	1000	59.7	862	80	1000	NR	NR	NR
CGMN-GW-MW19-LS-050517 Low Spike 0.5 ppb (C0001234, 500 ng/L Field Spike)	500	59.7	336	65	500	NR	NR	NR
CGMN-GW-MW19-HS-050517 High Spike 1.0 ppb (C0001235, 1000 ng/L Field Spike)	1000	59.7	732	67	1000	NR	NR	NR
CGMN-GW-DECON-0-050524 (C0001285 Spk C, 100 ng/L Lab Spike)	100	ND	108	108	100	ND	117	117
CGMN-GW-DECON-0-050524 (C0001285 Spk D, 5000 ng/L Lab Spike)	5000	ND	4850	97	5000	ND	4940	99
CGMN-GW-DECON-LS-050524 Low Spike 0.1 ppb (C0001287, 100 ng/L Field Spike)	100	ND	110	110	100	ND	111	111
CGMN-GW-DECON-HS-050524 High Spike 5.0 ppb (C0001288, 5000 ng/L Field Spike)	5000	ND	5200	104	5000	ND	4830	97
WBMN-GW-R1-0-050512 (C0001411 Spk E, 1000 ng/L Lab Spike)	1000	56.0	993	94	1000	2090	3440	135
WBMN-GW-R1-0-050512 (C0001411 Spk F, 10000 ng/L Lab Spike)	10000	56.0	9730	97	10000	2090	12800	107
WBMN-GW-R1-LS-050512 Low Spike 1.0 ppb (C0001413, 1000 ng/L Field Spike)	1000	58.9	800	74	1000	2090	3510	142
WBMN-GW-R1-HS-050512 High Spike 10 ppb (C0001415, 10000 ng/L Field Spike)	10000	58.9	9420	94	10000	2090	13300	112
WBMN-GW-R2-0-050512 (C0001416 Spk C, 1000 ng/L Lab Spike)	1000	ND	869	87	1000	ND	873	87
WBMN-GW-R2-0-050512 (C0001416 Spk D, 10000 ng/L Lab Spike)	10000	ND	9520	95	10000	ND	9380	94
WBMN-GW-R2-LS-050512 Low Spike 1.0 ppb (C0001417, 1000 ng/L Field Spike)	1000	ND	1110	111	1000	ND	1080	108
WBMN-GW-R2-HS-050512 High Spike 10 ppb (C0001418, 10000 ng/L Field Spike)	10000	ND	9870	99	10000	ND	9270	93

*Sample residue exceeds the spiking level significantly (>3x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VII. Matrix Spike Recovery of PFOS and PFOA in Ground Water Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/L)	Amt Found In Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/L)	Amt Found In Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
WBMN-GW-R3-0-050512 (C0001420 Spk E, 1000 ng/L Lab Spike)	1000	91.4	995	90	1000	159	1040	88
WBMN-GW-R3-0-050512 (C0001420 Spk F, 10000 ng/L Lab Spike)	10000	91.4	8900	88	10000	159	8500	83
WBMN-GW-R3-LS-050512 Low Spike 1.0 ppb (C0001423, 1000 ng/L Field Spike)	1000	91.4	1100	101	1000	159	1280	112
WBMN-GW-R3-HS-050512 High Spike 10 ppb (C0001423, 10000 ng/L Field Spike)	10000	91.4	8520	84	10000	159	9580	94
WBMN-GW-R4-0-050512 (C0001424 Spk G, 10000 ng/L Lab Spike)	10000	1660	10000	83	10000	2580	11400	88
WBMN-GW-R4-0-050512 (C0001424 Spk G, 100000 ng/L Lab Spike)	100000	1660	80800	79	100000	2580	84000	81
WBMN-GW-R4-LS-050512 Low Spike 1.0 ppb (C0001426, 10000 ng/L Field Spike)	10000	1660	12100	104	10000	2580	12800	100
WBMN-GW-R4-HS-050512 High Spike 100 ppb (C0001427, 100000 ng/L Field Spike)	100000	1660	106000	103	100000	2580	88400	86
WBMN-GW-CWM-0-050512 (C0001433 Spk C, 1000 ng/L Lab Spike)	1000	957	2060	110	1000	1940	2870	93
WBMN-GW-CWM-0-050512 (C0001428 Spk D, 10000 ng/L Lab Spike)	10000	957	9970	90	10000	1940	11000	91
WBMN-GW-CWM-LS-050512 Low Spike 1.0 ppb (C0001430, 1000 ng/L Field Spike)	1000	957	1830	87	1000	1940	3120	118
WBMN-GW-CWM-HS-050512 High Spike 10 ppb (C0001431, 10000 ng/L Field Spike)	10000	957	13600	126	10000	1940	13300	114
WBMN-GW-CWD01-0-050512 (C0001432 Spk E, 1000 ng/L Lab Spike)	1000	1220	2180	94	1000	3060	4380	*
WBMN-GW-CWD01-0-050512 (C0001432 Spk F, 10000 ng/L Lab Spike)	10000	1220	8620	73	10000	3060	11000	79
WBMN-GW-CWD01-LS-050512 Low Spike 1.0 ppb (C0001434, 1000 ng/L Field Spike)	1000	1220	1750	53	1000	3060	3660	*
WBMN-GW-CWD01-HS-050512 High Spike 10 ppb (C0001436, 10000 ng/L Field Spike)	10000	1220	7240	60	10000	3060	9870	68
WBMN-GW-TRIP-LS-050511 Low Spike 0.1 ppb (C0001437, 100 ng/L Trip Spike)	100	ND	106	106	100	ND	111	111
WBMN-GW-TRIP-HS-050511 High Spike 1.0 ppb (C0001436, 1000 ng/L Trip Spike)	1000	ND	948	95	1000	ND	898	90
			Average:	91			Average:	88
			Standard Deviation:	17			Standard Deviation:	17

*Sample residue exceeds the spiking level significantly (>3x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081358	CGMN-SS-D101-0-0005	4	3.28	82
C0081358 Rep	CGMN-SS-D101-0-0005	4	3.39	85
C0081358 Spk C	CGMN-SS-D101-0-0005	40	36.2	91
C0081358 Spk D	CGMN-SS-D101-0-0005	400	330	83
C0081359	CGMN-SS-D101-DB-0005	4	3.22	81
C0081359 Rep	CGMN-SS-D101-DB-0005	4	3.34	84
C0081359 Spk E	CGMN-SS-D101-DB-0005	40	34.3	86
C0081359 Spk F	CGMN-SS-D101-DB-0005	400	327	82
C0081360	CGMN-SS-D201-0-0000	4	3.23	81
C0081360 Rep	CGMN-SS-D201-0-0000	4	3.31	83
C0081360 Spk G	CGMN-SS-D201-0-0000	40	31.3	78
C0081360 Spk H	CGMN-SS-D201-0-0000	400	298	75
C0081361	CGMN-SS-D201-0-0005	4	3.18	80
C0081361 Rep	CGMN-SS-D201-0-0005	4	3.27	82
C0081361 Spk I	CGMN-SS-D201-0-0005	40	29.8	74
C0081361 Spk J	CGMN-SS-D201-0-0005	400	293	73
C0081362	CGMN-SS-D202-0-0000	4	3.17	79
C0081362 Rep	CGMN-SS-D202-0-0000	4	2.98	75
C0081362 Spk K	CGMN-SS-D202-0-0000	40	33.2	83
C0081362 Spk L	CGMN-SS-D202-0-0000	400	302	76
C0081363	CGMN-SS-D202-0-0005	4	3.02	76
C0081363 Rep	CGMN-SS-D202-0-0005	4	3.10	78
C0081363 Spk C	CGMN-SS-D202-0-0005	40	32.1	80
C0081363 Spk D	CGMN-SS-D202-0-0005	400	317	79
C0081374	CGMN-SS-D101-0-0000	4	3.07	77
C0081374 Rep	CGMN-SS-D101-0-0000	4	3.18	80
C0081374 Spk E	CGMN-SS-D101-0-0000	40	30.8	77
C0081374 Spk F	CGMN-SS-D101-0-0000	400	276	69
C0081388	CGMN-SS-B1502-0-0000	4	3.64	91
C0081388 Rep	CGMN-SS-B1502-0-0000	4	3.68	92
C0081388 Spk G	CGMN-SS-B1502-0-0000	40	36.0	90
C0081388 Spk H	CGMN-SS-B1502-0-0000	400	345	86
C0081389	CGMN-SS-B1502-0-0005	4	3.52	88
C0081389 Rep	CGMN-SS-B1502-0-0005	4	3.59	90
C0081389 Spk I	CGMN-SS-B1502-0-0005	40	35.4	89
C0081389 Spk J	CGMN-SS-B1502-0-0005	400	307	77
C0081390	CGMN-SS-B1501-0-0000	4	3.57	89
C0081390 Rep	CGMN-SS-B1501-0-0000	4	3.66	92
C0081390 Spk K	CGMN-SS-B1501-0-0000	40	34.5	86
C0081390 Spk L	CGMN-SS-B1501-0-0000	400	302	76

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081391	CGMN-SS-B1501-0-0005	4	3.47	87
C0081391 Rep	CGMN-SS-B1501-0-0005	4	3.53	88
C0081391 Spk C	CGMN-SS-B1501-0-0005	40	34.8	87
C0081391 Spk D	CGMN-SS-B1501-0-0005	400	341	85
C0081163	CGMN-SBC-D203-0-0000	4	2.56	64
C0081163 Rep	CGMN-SBC-D203-0-0000	4	2.42	61
C0081163 Spk E	CGMN-SBC-D203-0-0000	40	30.3	76
C0081163 Spk F	CGMN-SBC-D203-0-0000	400	284	71
C0081164	CGMN-SBC-D203-0-0050	4	1.96	49
C0081164 Rep	CGMN-SBC-D203-0-0050	4	1.75	44
C0081164 Spk G	CGMN-SBC-D203-0-0050	40	23.5	59
C0081164 Spk H	CGMN-SBC-D203-0-0050	400	269	67
C0081165	CGMN-SBC-D203-0-0100	4	1.90	48
C0081165 Rep	CGMN-SBC-D203-0-0100	4	1.90	48
C0081165 Spk I	CGMN-SBC-D203-0-0100	40	24.2	61
C0081165 Spk J	CGMN-SBC-D203-0-0100	400	271	68
C0081166	CGMN-SBC-D203-0-0150	4	2.09	52
C0081166 Rep	CGMN-SBC-D203-0-0150	4	2.00	50
C0081166 Spk K	CGMN-SBC-D203-0-0150	40	23.3	58
C0081166 Spk L	CGMN-SBC-D203-0-0150	400	298	75
C0081167	CGMN-SBC-D203-0-0200	4	2.12	53
C0081167 Rep	CGMN-SBC-D203-0-0200	4	2.02	51
C0081167 Spk C	CGMN-SBC-D203-0-0200	40	23.1	58
C0081167 Spk D	CGMN-SBC-D203-0-0200	400	262	66
C0081168	CGMN-SBC-D203-0-0250	4	2.62	66
C0081168 Rep	CGMN-SBC-D203-0-0250	4	2.58	65
C0081168 Spk E	CGMN-SBC-D203-0-0250	40	31.0	78
C0081168 Spk F	CGMN-SBC-D203-0-0250	400	331	83
C0081169	CGMN-SBC-D203-0-0300	4	2.80	70
C0081169 Rep	CGMN-SBC-D203-0-0300	4	2.90	73
C0081169 Spk G	CGMN-SBC-D203-0-0300	40	33.7	84
C0081169 Spk H	CGMN-SBC-D203-0-0300	400	342	86
C0081170	CGMN-SBC-D203-DB-0300	4	3.09	77
C0081170 Rep	CGMN-SBC-D203-DB-0300	4	2.78	70
C0081170 Spk I	CGMN-SBC-D203-DB-0300	40	36.2	91
C0081170 Spk J	CGMN-SBC-D203-DB-0300	400	342	86
C0081171	CGMN-SBC-D203-0-0350	4	2.94	74
C0081171 Rep	CGMN-SBC-D203-0-0350	4	2.88	72
C0081171 Spk K	CGMN-SBC-D203-0-0350	40	34.5	86
C0081171 Spk L	CGMN-SBC-D203-0-0350	400	347	87

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081172	CGMN-SBC-D203-0-0400	4	3.33	83
C0081172 Rep	CGMN-SBC-D203-0-0400	4	3.19	80
C0081172 Spk C	CGMN-SBC-D203-0-0400	40	35.8	90
C0081172 Spk D	CGMN-SBC-D203-0-0400	400	349	87
C0081173	CGMN-SBC-D203-0-0450	4	3.27	82
C0081173 Rep	CGMN-SBC-D203-0-0450	4	3.22	81
C0081173 Spk E	CGMN-SBC-D203-0-0450	40	30.8	77
C0081173 Spk F	CGMN-SBC-D203-0-0450	400	338	85
C0081174	CGMN-SBC-D202-0-0000	4	1.82	46
C0081174 Rep	CGMN-SBC-D202-0-0000	4	1.64	41
C0081174 Spk G	CGMN-SBC-D202-0-0000	40	25.9	65
C0081174 Spk H	CGMN-SBC-D202-0-0000	400	243	61
C0081175	CGMN-SBC-D202-0-0050	4	1.97	49
C0081175 Rep	CGMN-SBC-D202-0-0050	4	1.94	49
C0081175 Spk I	CGMN-SBC-D202-0-0050	40	22.8	57
C0081175 Spk J	CGMN-SBC-D202-0-0050	400	235	59
C0081176	CGMN-SBC-D202-0-0100	4	2.39	60
C0081176 Rep	CGMN-SBC-D202-0-0100	4	2.42	61
C0081176 Spk K	CGMN-SBC-D202-0-0100	40	25.8	65
C0081176 Spk L	CGMN-SBC-D202-0-0100	400	282	71
C0081177	CGMN-SBC-D202-0-0150	4	1.93	48
C0081177 Rep	CGMN-SBC-D202-0-0150	4	1.79	45
C0081177 Spk C	CGMN-SBC-D202-0-0150	40	26.8	67
C0081177 Spk D	CGMN-SBC-D202-0-0150	400	254	64
C0081178	CGMN-SBC-D202-0-0200	4	2.24	56
C0081178 Rep	CGMN-SBC-D202-0-0200	4	2.08	52
C0081178 Spk E	CGMN-SBC-D202-0-0200	40	29.7	74
C0081178 Spk F	CGMN-SBC-D202-0-0200	400	300	75
C0081179	CGMN-SBC-D202-0-0250	4	2.98	75
C0081179 Rep	CGMN-SBC-D202-0-0250	4	2.82	71
C0081179 Spk G	CGMN-SBC-D202-0-0250	40	35.5	89
C0081179 Spk H	CGMN-SBC-D202-0-0250	400	342	86
C0081180	CGMN-SBC-D202-0-0300	4	2.42	61
C0081180 Rep	CGMN-SBC-D202-0-0300	4	2.48	62
C0081180 Spk I	CGMN-SBC-D202-0-0300	40	33.8	85
C0081180 Spk J	CGMN-SBC-D202-0-0300	400	326	82
C0081181	CGMN-SBC-D202-0-0350	4	2.90	73
C0081181 Rep	CGMN-SBC-D202-0-0350	4	2.93	73
C0081181 Spk K	CGMN-SBC-D202-0-0350	40	35.1	88
C0081181 Spk L	CGMN-SBC-D202-0-0350	400	336	84

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081182	CGMN-SBC-D202-DB-0350	4	2.90	73
C0081182 Rep	CGMN-SBC-D202-DB-0350	4	2.83	71
C0081182 Spk C	CGMN-SBC-D202-DB-0350	40	35.0	88
C0081182 Spk D	CGMN-SBC-D202-DB-0350	400	328	82
C0081183	CGMN-SBC-D202-0-0400	4	2.81	70
C0081183 Rep	CGMN-SBC-D202-0-0400	4	2.72	68
C0081183 Spk E	CGMN-SBC-D202-0-0400	40	31.5	79
C0081183 Spk F	CGMN-SBC-D202-0-0400	400	337	84
C0081184	CGMN-SBC-D202-0-0450	4	2.79	70
C0081184 Rep	CGMN-SBC-D202-0-0450	4	2.80	70
C0081184 Spk G	CGMN-SBC-D202-0-0450	40	32.7	82
C0081184 Spk H	CGMN-SBC-D202-0-0450	400	338	85
C0081185	CGMN-SBC-D201-0-0000	4	2.90	73
C0081185 Rep	CGMN-SBC-D201-0-0000	4	2.71	68
C0081185 Spk I	CGMN-SBC-D201-0-0000	40	31.5	79
C0081185 Spk J	CGMN-SBC-D201-0-0000	400	286	72
C0081186	CGMN-SBC-D201-0-0050	4	2.08	52
C0081186 Rep	CGMN-SBC-D201-0-0050	4	2.08	52
C0081186 Spk K	CGMN-SBC-D201-0-0050	40	25.4	64
C0081186 Spk L	CGMN-SBC-D201-0-0050	400	266	67
C0081187	CGMN-SBC-D201-0-0100	4	3.56	89
C0081187 Rep	CGMN-SBC-D201-0-0100	4	3.46	87
C0081187 Spk C	CGMN-SBC-D201-0-0100	40	38.2	96
C0081187 Spk D	CGMN-SBC-D201-0-0100	400	374	94
C0081188	CGMN-SBC-D201-DB-0100	4	3.25	81
C0081188 Rep	CGMN-SBC-D201-DB-0100	4	3.03	76
C0081188 Spk E	CGMN-SBC-D201-DB-0100	40	33.9	85
C0081188 Spk F	CGMN-SBC-D201-DB-0100	400	346	87
C0081189	CGMN-SBC-D201-0-0150	4	2.06	52
C0081189 Rep	CGMN-SBC-D201-0-0150	4	2.06	52
C0081189 Spk G	CGMN-SBC-D201-0-0150	40	18.9	47
C0081189 Spk H	CGMN-SBC-D201-0-0150	400	262	66
C0081190	CGMN-SBC-D201-0-0200	4	1.61	40
C0081190 Rep	CGMN-SBC-D201-0-0200	4	1.69	42
C0081190 Spk I	CGMN-SBC-D201-0-0200	40	28.5	71
C0081190 Spk J	CGMN-SBC-D201-0-0200	400	317	79
C0081191	CGMN-SBC-D201-0-0250	4	1.86	47
C0081191 Rep	CGMN-SBC-D201-0-0250	4	1.82	46
C0081191 Spk K	CGMN-SBC-D201-0-0250	40	29.4	74
C0081191 Spk L	CGMN-SBC-D201-0-0250	400	312	78

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	^{13}C-PFOA Amount Recovered (ng/g)	^{13}C-PFOA Recovery (%)
C0081192	CGMN-SBC-D201-0-0300	4	1.98	50
C0081192 Rep	CGMN-SBC-D201-0-0300	4	2.01	50
C0081192 Spk C	CGMN-SBC-D201-0-0300	40	31.6	79
C0081192 Spk D	CGMN-SBC-D201-0-0300	400	342	86
C0081193	CGMN-SBC-D201-0-0350	4	2.45	61
C0081193 Rep	CGMN-SBC-D201-0-0350	4	2.56	64
C0081193 Spk E	CGMN-SBC-D201-0-0350	40	35.6	89
C0081193 Spk F	CGMN-SBC-D201-0-0350	400	384	96
C0081194	CGMN-SBC-D201-0-0400	4	2.70	68
C0081194 Rep	CGMN-SBC-D201-0-0400	4	2.82	71
C0081194 Spk G	CGMN-SBC-D201-0-0400	40	35.3	88
C0081194 Spk H	CGMN-SBC-D201-0-0400	400	354	89
C0081195	CGMN-SBC-D104-0-0000	4	NR	NR
C0081195 Rep	CGMN-SBC-D104-0-0000	4	NR	NR
C0081195 Spk I	CGMN-SBC-D104-0-0000	40	NR	NR
C0081195 Spk J	CGMN-SBC-D104-0-0000	400	NR	NR
C0081196	CGMN-SBC-D104-0-0050	4	1.96	49
C0081196 Rep	CGMN-SBC-D104-0-0050	4	1.81	45
C0081196 Spk K	CGMN-SBC-D104-0-0050	40	23.9	60
C0081196 Spk L	CGMN-SBC-D104-0-0050	400	275	69
C0081197	CGMN-SBC-D104-DB-0050	4	2.18	55
C0081197 Rep	CGMN-SBC-D104-DB-0050	4	2.42	61
C0081197 Spk C	CGMN-SBC-D104-DB-0050	40	33.5	84
C0081197 Spk D	CGMN-SBC-D104-DB-0050	400	336	84
C0081198	CGMN-SBC-D104-0-0100	4	1.75	44
C0081198 Rep	CGMN-SBC-D104-0-0100	4	1.81	45
C0081198 Spk E	CGMN-SBC-D104-0-0100	40	30.2	76
C0081198 Spk F	CGMN-SBC-D104-0-0100	400	366	92
C0081199	CGMN-SBC-D104-0-0150	4	1.76	45
C0081199 Rep	CGMN-SBC-D104-0-0150	4	1.78	44
C0081199 Spk G	CGMN-SBC-D104-0-0150	40	33.9	85
C0081199 Spk H	CGMN-SBC-D104-0-0150	400	341	85
C0081200	CGMN-SBC-D104-0-0200	4	2.01	50
C0081200 Rep	CGMN-SBC-D104-0-0200	4	1.79	45
C0081200 Spk [illegible]	CGMN-SBC-D104-0-0200	40	28.6	72
C0081200 Spk J	CGMN-SBC-D104-0-0200	400	362	91
C0081201	CGMN-SBC-D104-0-0250	4	1.74	44
C0081201 Rep	CGMN-SBC-D104-0-0250	4	1.79	45
C0081201 Spk K	CGMN-SBC-D104-0-0250	40	28.0	70
C0081201 Spk L	CGMN-SBC-D104-0-0250	400	328	82

NR = Not reported due to quality control result failures.

***Note:* Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.**

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081202	CGMN-SBC-D104-0-0300	4	2.67	67
C0081202 Rep	CGMN-SBC-D104-0-0300	4	2.74	69
C0081192 Spk C	CGMN-SBC-D104-0-0300	40	35.1	88
C0081192 Spk D	CGMN-SBC-D104-0-0300	400	374	94
C0081203	CGMN-SBC-D104-0-0350	4	2.62	66
C0081203 Rep	CGMN-SBC-D104-0-0350	4	2.63	66
C0081203 Spk E	CGMN-SBC-D104-0-0350	40	34.8	87
C0081203 Spk F	CGMN-SBC-D104-0-0350	400	365	91
C0081205	CGMN-SBC-D104-0-0400	4	2.97	74
C0081205 Rep	CGMN-SBC-D104-0-0400	4	2.98	75
C0081205 Spk G	CGMN-SBC-D104-0-0400	40	35.2	88
C0081205 Spk H	CGMN-SBC-D104-0-0400	400	352	88
C0081206	CGMN-SBC-D104-0-0450	4	3.12	78
C0081206 Rep	CGMN-SBC-D104-0-0450	4	3.07	77
C0081206 Spk I	CGMN-SBC-D104-0-0450	40	36.8	92
C0081206 Spk J	CGMN-SBC-D104-0-0450	400	361	90
C0081207	CGMN-SBC-D104-DB-0450	4	3.09	77
C0081207 Rep	CGMN-SBC-D104-DB-0450	4	3.01	75
C0081207 Spk K	CGMN-SBC-D104-DB-0450	40	35.8	90
C0081207 Spk L	CGMN-SBC-D104-DB-0450	400	375	94
C0081208	CGMN-SBC-D104-0-0500	4	2.48	62
C0081208 Rep	CGMN-SBC-D104-0-0500	4	2.59	65
C0081208 Spk C	CGMN-SBC-D104-0-0500	40	32.7	82
C0081197 Spk D	CGMN-SBC-D104-0-0500	400	365	91
C0081209	CGMN-SBC-D104-0-0550	4	2.59	65
C0081209 Rep	CGMN-SBC-D104-0-0550	4	2.50	63
C0081209 Spk E	CGMN-SBC-D104-0-0550	40	36.7	92
C0081209 Spk F	CGMN-SBC-D104-0-0550	400	363	91
C0081210	CGMN-SBC-D104-0-0600	4	2.74	69
C0081210 Rep	CGMN-SBC-D104-0-0600	4	2.72	68
C0081210 Spk G	CGMN-SBC-D104-0-0600	40	35.7	89
C0081210 Spk H	CGMN-SBC-D104-0-0600	400	330	83
C0081211	CGMN-SBC-D104-0-0650	4	2.56	64
C0081211 Rep	CGMN-SBC-D104-0-0650	4	2.48	62
C0081211 Spk I	CGMN-SBC-D104-0-0650	40	33.7	84
C0081211 Spk J	CGMN-SBC-D104-0-0650	400	338	85
C0081212	CGMN-SBC-D103-0-0000	4	3.03	76
C0081212 Rep	CGMN-SBC-D103-0-0000	4	3.20	80
C0081212 Spk K	CGMN-SBC-D103-0-0000	40	30.5	76
C0081212 Spk L	CGMN-SBC-D103-0-0000	400	306	77

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081213	CGMN-SBC-D103-0-0050	4	2.67	67
C0081213 Rep	CGMN-SBC-D103-0-0050	4	2.75	69
C0081213 Spk C	CGMN-SBC-D103-0-0050	40	35.7	89
C0081213 Spk D	CGMN-SBC-D103-0-0050	400	367	92
C0081214	CGMN-SBC-D103-0-0100	4	2.66	67
C0081214 Rep	CGMN-SBC-D103-0-0100	4	2.88	72
C0081214 Spk E	CGMN-SBC-D103-0-0100	40	34.9	87
C0081214 Spk F	CGMN-SBC-D103-0-0100	400	366	92
C0081215	CGMN-SBC-D103-0-0150	4	2.89	72
C0081215 Rep	CGMN-SBC-D103-0-0150	4	2.83	71
C0081215 Spk G	CGMN-SBC-D103-0-0150	40	32.2	81
C0081215 Spk H	CGMN-SBC-D103-0-0150	400	354	89
C0081216	CGMN-SBC-D103-DB-0150	4	3.03	76
C0081216 Rep	CGMN-SBC-D103-DB-0150	4	2.98	75
C0081216 Spk I	CGMN-SBC-D103-DB-0150	40	33.7	84
C0081216 Spk J	CGMN-SBC-D103-DB-0150	400	363	91
C0081217	CGMN-SBC-D103-0-0200	4	2.68	67
C0081217 Rep	CGMN-SBC-D103-0-0200	4	2.66	67
C0081217 Spk K	CGMN-SBC-D103-0-0200	40	33.8	85
C0081217 Spk L	CGMN-SBC-D103-0-0200	400	350	88
C0081219	CGMN-SBC-D103-0-0250	4	NR	NR
C0081219 Rep	CGMN-SBC-D103-0-0250	4	NR	NR
C0081219 Spk C	CGMN-SBC-D103-0-0250	40	NR	NR
C0081219 Spk D	CGMN-SBC-D103-0-0250	400	NR	NR
C0081220	CGMN-SBC-D103-0-0300	4	2.58	65
C0081220 Rep	CGMN-SBC-D103-0-0300	4	2.55	64
C0081220 Spk E	CGMN-SBC-D103-0-0300	40	37.2	93
C0081220 Spk F	CGMN-SBC-D103-0-0300	400	333	83
C0081221	CGMN-SBC-D103-0-0350	4	2.77	69
C0081221 Rep	CGMN-SBC-D103-0-0350	4	2.88	72
C0081221 Spk G	CGMN-SBC-D103-0-0350	40	36.1	90
C0081221 Spk H	CGMN-SBC-D103-0-0350	400	313	78
C0081222	CGMN-SBC-D103-0-0400	4	2.70	68
C0081222 Rep	CGMN-SBC-D103-0-0400	4	2.50	63
C0081222 Spk I	CGMN-SBC-D103-0-0400	40	36.0	90
C0081222 Spk J	CGMN-SBC-D103-0-0400	400	345	86
C0081236	CGMN-SBC-D103-0-0450	4	2.83	71
C0081236 Rep	CGMN-SBC-D103-0-0450	4	2.86	72
C0081236 Spk K	CGMN-SBC-D103-0-0450	40	35.6	90
C0081236 Spk L	CGMN-SBC-D103-0-0450	400	368	92

NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081238	CGMN-SBC-D103-0-0500	4	3.12	78
C0081238 Rep	CGMN-SBC-D103-0-0500	4	3.30	83
C0081238 Spk C	CGMN-SBC-D103-0-0500	40	37.8	95
C0081238 Spk D	CGMN-SBC-D103-0-0500	400	342	86
C0081239	CGMN-SBC-D103-0-0550	4	2.80	70
C0081239 Rep	CGMN-SBC-D103-0-0550	4	2.79	70
C0081239 Spk E	CGMN-SBC-D103-0-0550	40	36.4	91
C0081239 Spk F	CGMN-SBC-D103-0-0550	400	366	92
C0081240	CGMN-SBC-D103-0-0600	4	2.69	67
C0081240 Rep	CGMN-SBC-D103-0-0600	4	2.66	67
C0081240 Spk G	CGMN-SBC-D103-0-0600	40	35.6	89
C0081240 Spk H	CGMN-SBC-D103-0-0600	400	357	89
C0081241	CGMN-SBC-D103-0-0650	4	2.72	68
C0081241 Rep	CGMN-SBC-D103-0-0650	4	2.71	68
C0081241 Spk I	CGMN-SBC-D103-0-0650	40	37.6	94
C0081241 Spk J	CGMN-SBC-D103-0-0650	400	358	90
C0081248	CGMN-SBC-D801-0-0000	4	2.68	67
C0081248 Rep	CGMN-SBC-D801-0-0000	4	2.68	67
C0081248 Spk K	CGMN-SBC-D801-0-0000	40	37.4	94
C0081248 Spk L	CGMN-SBC-D801-0-0000	400	338	85
C0081249	CGMN-SBC-D801-0-0050	4	2.43	61
C0081249 Rep	CGMN-SBC-D801-0-0050	4	2.59	65
C0081249 Spk C	CGMN-SBC-D801-0-0050	40	34.2	86
C0081249 Spk D	CGMN-SBC-D801-0-0050	400	370	93
C0081250	CGMN-SBC-D801-0-0100	4	2.56	64
C0081250 Rep	CGMN-SBC-D801-0-0100	4	2.38	60
C0081250 Spk E	CGMN-SBC-D801-0-0100	40	38.1	95
C0081250 Spk F	CGMN-SBC-D801-0-0100	400	347	87
C0081251	CGMN-SBC-D801-0-0150	4	3.18	80
C0081251 Rep	CGMN-SBC-D801-0-0150	4	3.33	83
C0081251 Spk G	CGMN-SBC-D801-0-0150	40	37.0	93
C0081251 Spk H	CGMN-SBC-D801-0-0150	400	372	93
C0081252	CGMN-SBC-D801-0-0200	4	2.90	73
C0081252 Rep	CGMN-SBC-D801-0-0200	4	2.98	75
C0081252 Spk I	CGMN-SBC-D801-0-0200	40	38.1	95
C0081252 Spk J	CGMN-SBC-D801-0-0200	400	344	86
C0081274	CGMN-SBC-D101-0-0000	4	3.51	88
C0081274 Rep	CGMN-SBC-D101-0-0000	4	3.41	85
C0081274 Spk K	CGMN-SBC-D101-0-0000	40	34.5	86
C00812074 Spk L	CGMN-SBC-D101-0-0000	400	327	82

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081275	CGMN-SBC-D101-0-0050	4	3.19	80
C0081275 Rep	CGMN-SBC-D101-0-0050	4	3.18	79
C0081275 Spk C	CGMN-SBC-D101-0-0050	40	33.2	83
C0081275 Spk D	CGMN-SBC-D101-0-0050	400	354	89
C0081277	CGMN-SBC-D101-0-0100	4	2.74	69
C0081277 Rep	CGMN-SBC-D101-0-0100	4	2.80	70
C0081277 Spk E	CGMN-SBC-D101-0-0100	40	37.3	93
C0081277 Spk F	CGMN-SBC-D101-0-0100	400	354	89
C0081278	CGMN-SBC-D101-DB-0100	4	2.71	68
C0081278 Rep	CGMN-SBC-D101-DB-0100	4	2.66	67
C0081278 Spk G	CGMN-SBC-D101-DB-0100	40	33.8	85
C0081278 Spk H	CGMN-SBC-D101-DB-0100	400	362	91
C0081279	CGMN-SBC-D101-0-0150	4	3.38	85
C0081279 Rep	CGMN-SBC-D101-0-0150	4	3.36	84
C0081279 Spk I	CGMN-SBC-D101-0-0150	40	35.8	90
C0081279 Spk J	CGMN-SBC-D101-0-0150	400	338	85
C0081280	CGMN-SBC-D101-0-0200	4	3.29	82
C0081280 Rep	CGMN-SBC-D101-0-0200	4	3.64	91
C0081280 Spk K	CGMN-SBC-D101-0-0200	40	37.8	95
C0081280 Spk L	CGMN-SBC-D101-0-0200	400	353	88
C0081281	CGMN-SBC-D102-0-0000	4	NR	NR
C0081281 Rep	CGMN-SBC-D102-0-0000	4	NR	NR
C0081281 Spk C	CGMN-SBC-D102-0-0000	40	NR	NR
C0081281 Spk D	CGMN-SBC-D102-0-0000	400	NR	NR
C0081282	CGMN-SBC-D102-0-0050	4	2.82	71
C0081282 Rep	CGMN-SBC-D102-0-0050	4	2.74	69
C0081282 Spk E	CGMN-SBC-D102-0-0050	40	33.4	84
C0081282 Spk F	CGMN-SBC-D102-0-0050	400	362	91
C0081283	CGMN-SBC-D102-0-0100	4	2.89	72
C0081283 Rep	CGMN-SBC-D102-0-0100	4	2.87	72
C0081283 Spk G	CGMN-SBC-D102-0-0100	40	33.9	85
C0081283 Spk H	CGMN-SBC-D102-0-0100	400	349	87
C0081284	CGMN-SBC-D102-0-0150	4	3.39	85
C0081284 Rep	CGMN-SBC-D102-0-0150	4	3.20	80
C0081284 Spk I	CGMN-SBC-D102-0-0150	40	35.5	89
C0081284 Spk J	CGMN-SBC-D102-0-0150	400	347	87
C0081285	CGMN-SBC-D102-0-0200	4	3.02	76
C0081285 Rep	CGMN-SBC-D102-0-0200	4	3.14	79
C0081285 Spk K	CGMN-SBC-D102-0-0200	40	35.8	90
C0081285 Spk L	CGMN-SBC-D102-0-0200	400	370	93

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081342	CGMN-SBC-B1501-0-0000	4	3.57	89
C0081342 Rep	CGMN-SBC-B1501-0-0000	4	3.26	82
C0081342 Spk C	CGMN-SBC-B1501-0-0000	40	36.9	92
C0081342 Spk D	CGMN-SBC-B1501-0-0000	400	360	90
C0081343	CGMN-SBC-B1501-0-0050	4	2.91	73
C0081343 Rep	CGMN-SBC-B1501-0-0050	4	2.80	70
C0081343 Spk E	CGMN-SBC-B1501-0-0050	40	35.8	90
C0081343 Spk F	CGMN-SBC-B1501-0-0050	400	350	88
C0081344	CGMN-SBC-B1501-0-0100	4	2.74	69
C0081344 Rep	CGMN-SBC-B1501-0-0100	4	2.82	71
C0081344 Spk G	CGMN-SBC-B1501-0-0100	40	35.0	88
C0081344 Spk H	CGMN-SBC-B1501-0-0100	400	332	83
C0081345	CGMN-SBC-B1501-0-0150	4	2.96	74
C0081345 Rep	CGMN-SBC-B1501-0-0150	4	3.00	75
C0081345 Spk I	CGMN-SBC-B1501-0-0150	40	34.2	86
C0081345 Spk J	CGMN-SBC-B1501-0-0150	400	338	85
C0081346	CGMN-SBC-B1501-0-0200	4	2.55	64
C0081346 Rep	CGMN-SBC-B1501-0-0200	4	2.60	65
C0081346 Spk K	CGMN-SBC-B1501-0-0200	40	34.2	86
C0081346 Spk L	CGMN-SBC-B1501-0-0200	400	332	83
C0081242	CGMN-SBC-D501-0-0000	4	NR	NR
C0081242 Rep	CGMN-SBC-D501-0-0000	4	NR	NR
C0081242 Spk C	CGMN-SBC-D501-0-0000	40	NR	NR
C0081242 Spk D	CGMN-SBC-D501-0-0000	400	NR	NR
C0081243	CGMN-SBC-D501-0-0050	4	2.84	71
C0081243 Rep	CGMN-SBC-D501-0-0050	4	2.93	73
C0081243 Spk E	CGMN-SBC-D501-0-0050	40	32.8	82
C0081243 Spk F	CGMN-SBC-D501-0-0050	400	342	86
C0081244	CGMN-SBC-D501-DB-0050	4	2.98	75
C0081244 Rep	CGMN-SBC-D501-DB-0050	4	2.82	71
C0081244 Spk G	CGMN-SBC-D501-DB-0050	40	30.7	77
C0081244 Spk H	CGMN-SBC-D501-DB-0050	400	318	80
C0081245	CGMN-SBC-D501-0-0100	4	2.88	72
C0081245 Rep	CGMN-SBC-D501-0-0100	4	2.94	74
C0081245 Spk I	CGMN-SBC-D501-0-0100	40	33.8	85
C0081245 Spk J	CGMN-SBC-D501-0-0100	400	341	85
C0081246	CGMN-SBC-D501-0-0150	4	3.58	90
C0081246 Rep	CGMN-SBC-D501-0-0150	4	3.39	85
C0081246 Spk K	CGMN-SBC-D501-0-0150	40	35.6	89
C0081246 Spk L	CGMN-SBC-D501-0-0150	400	360	90

NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081247	CGMN-SBC-D501-0-0200	4	2.85	71
C0081247 Rep	CGMN-SBC-D501-0-0200	4	2.70	68
C0081247 Spk C	CGMN-SBC-D501-0-0200	40	33.5	84
C0081247 Spk D	CGMN-SBC-D501-0-0200	400	329	82
C0081253	CGMN-SBC-FTA02-0-0000	4	3.23	81
C0081253 Rep	CGMN-SBC-FTA02-0-0000	4	3.02	76
C0081253 Spk E	CGMN-SBC-FTA02-0-0000	40	32.1	80
C0081253 Spk F	CGMN-SBC-FTA02-0-0000	400	300	75
C0081254	CGMN-SBC-FTA02-0-0050	4	3.29	82
C0081254 Rep	CGMN-SBC-FTA02-0-0050	4	3.42	86
C0081254 Spk G	CGMN-SBC-FTA02-0-0050	40	35.8	90
C0081254 Spk H	CGMN-SBC-FTA02-0-0050	400	343	86
C0081255	CGMN-SBC-FTA02-DB-0100	4	3.59	90
C0081255 Rep	CGMN-SBC-FTA02-DB-0100	4	3.74	94
C0081255 Spk I	CGMN-SBC-FTA02-DB-0100	40	34.9	87
C0081255 Spk J	CGMN-SBC-FTA02-DB-0100	400	359	90
C0081256	CGMN-SBC-FTA02-0-0100	4	3.64	91
C0081256 Rep	CGMN-SBC-FTA02-0-0100	4	3.50	88
C0081256 Spk K	CGMN-SBC-FTA02-0-0100	40	40.4	101
C0081256 Spk L	CGMN-SBC-FTA02-0-0100	400	358	90
C0081257	CGMN-SBC-FTA02-0-0150	4	3.38	85
C0081257 Rep	CGMN-SBC-FTA02-0-0150	4	3.39	85
C0081257 Spk C	CGMN-SBC-FTA02-0-0150	40	37.0	93
C0081257 Spk D	CGMN-SBC-FTA02-0-0150	400	338	85
C0081258	CGMN-SBC-FTA02-0-0200	4	3.44	86
C0081258 Rep	CGMN-SBC-FTA02-0-0200	4	3.50	88
C0081258 Spk E	CGMN-SBC-FTA02-0-0200	40	35.6	89
C0081258 Spk F	CGMN-SBC-FTA02-0-0200	400	336	86
C0081259	CGMN-SBC-FTA03-0-0000	4	2.51	63
C0081259 Rep	CGMN-SBC-FTA03-0-0000	4	2.58	65
C0081259 Spk G	CGMN-SBC-FTA03-0-0000	40	33.5	84
C0081259 Spk H	CGMN-SBC-FTA03-0-0000	400	342	86
C0081260	CGMN-SBC-FTA03-0-0100	4	3.14	79
C0081260 Rep	CGMN-SBC-FTA03-0-0100	4	3.25	81
C0081260 Spk I	CGMN-SBC-FTA03-0-0100	40	35.9	90
C0081260 Spk J	CGMN-SBC-FTA03-0-0100	400	345	86
C0081262	CGMN-SBC-FTA03-0-0100	4	3.31	83
C0081262 Rep	CGMN-SBC-FTA03-0-0100	4	3.40	85
C0081262 Spk K	CGMN-SBC-FTA03-0-0100	40	37.4	94
C0081262 Spk L	CGMN-SBC-FTA03-0-0100	400	348	87

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	^{13}C-PFOA Amount Recovered (ng/g)	^{13}C-PFOA Recovery (%)
C0081263	CGMN-SBC-FTA03-0-0150	4	3.44	86
C0081263 Rep	CGMN-SBC-FTA03-0-0150	4	3.58	90
C0081263 Spk C	CGMN-SBC-FTA03-0-0150	40	34.1	85
C0081263 Spk D	CGMN-SBC-FTA03-0-0150	400	346	87
C0081264	CGMN-SBC-FTA03-0-0200	4	2.90	73
C0081264 Rep	CGMN-SBC-FTA03-0-0200	4	2.86	72
C0081264 Spk E	CGMN-SBC-FTA03-0-0200	40	32.4	81
C0081264 Spk F	CGMN-SBC-FTA03-0-0200	400	332	83
C0081269	CGMN-SBC-FTA01-0-0000	4	2.61	65
C0081269 Rep	CGMN-SBC-FTA01-0-0000	4	2.58	65
C0081269 Spk G	CGMN-SBC-FTA01-0-0000	40	31.7	79
C0081269 Spk H	CGMN-SBC-FTA01-0-0000	400	305	76
C0081270	CGMN-SBC-FTA01-0-0050	4	3.16	79
C0081270 Rep	CGMN-SBC-FTA01-0-0050	4	3.22	81
C0081270 Spk I	CGMN-SBC-FTA01-0-0050	40	33.1	83
C0081270 Spk J	CGMN-SBC-FTA01-0-0050	400	348	87
C0081271	CGMN-SBC-FTA01-0-0100	4	3.46	87
C0081271 Rep	CGMN-SBC-FTA01-0-0100	4	3.57	89
C0081271 Spk K	CGMN-SBC-FTA01-0-0100	40	34.1	85
C0081271 Spk L	CGMN-SBC-FTA01-0-0100	400	334	84
C0081272	CGMN-SBC-FTA01-0-0150	4	3.01	75
C0081272 Rep	CGMN-SBC-FTA01-0-0150	4	3.10	78
C0081272 Spk C	CGMN-SBC-FTA01-0-0150	40	31.7	79
C0081272 Spk D	CGMN-SBC-FTA01-0-0150	400	341	85
C0081273	CGMN-SBC-FTA01-0-0200	4	NR	NR
C0081273 Rep	CGMN-SBC-FTA01-0-0200	4	NR	NR
C0081273 Spk E	CGMN-SBC-FTA01-0-0200	40	NR	NR
C0081273 Spk F	CGMN-SBC-FTA01-0-0200	400	NR	NR
C0081329	CGMN-SBC-WPA01-0-0000	4	3.33	83
C0081329 Rep	CGMN-SBC-WPA01-0-0000	4	2.83	71
C0081329 Spk G	CGMN-SBC-WPA01-0-0000	40	32.7	82
C0081329 Spk H	CGMN-SBC-WPA01-0-0000	400	284	71
C0081330	CGMN-SBC-WPA01-0-0050	4	3.40	85
C0081330 Rep	CGMN-SBC-WPA01-0-0050	4	3.36	84
C0081330 Spk I	CGMN-SBC-WPA01-0-0050	40	33.8	85
C0081330 Spk J	CGMN-SBC-WPA01-0-0050	400	344	86
C0081331	CGMN-SBC-WPA01-0-0100	4	3.51	88
C0081331 Rep	CGMN-SBC-WPA01-0-0100	4	3.43	86
C0081331 Spk K	CGMN-SBC-WPA01-0-0100	40	34.2	86
C0081331 Spk L	CGMN-SBC-WPA01-0-0100	400	380	95

NR = Not reported due to quality control result failures.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081332	CGMN-SBC-WPA01-DB-0100	4	3.20	80
C0081332 Rep	CGMN-SBC-WPA01-DB-0100	4	3.32	83
C0081332 Spk C	CGMN-SBC-WPA01-DB-0100	40	33.3	83
C0081332 Spk D	CGMN-SBC-WPA01-DB-0100	400	325	81
C0081333	CGMN-SBC-WPA01-0-0150	4	3.22	81
C0081333 Rep	CGMN-SBC-WPA01-0-0150	4	3.07	77
C0081333 Spk E	CGMN-SBC-WPA01-0-0150	40	28.2	71
C0081333 Spk F	CGMN-SBC-WPA01-0-0150	400	298	75
C0081334	CGMN-SBC-WPA01-0-0200	4	NR	NR
C0081334 Rep	CGMN-SBC-WPA01-0-0200	4	NR	NR
C0081334 Spk G	CGMN-SBC-WPA01-0-0200	40	NR	NR
C0081334 Spk H	CGMN-SBC-WPA01-0-0200	400	NR	NR
C0081335	CGMN-SBC-BKG01-0-0000	4	3.31	83
C0081335 Rep	CGMN-SBC-BKG01-0-0000	4	3.28	82
C0081335 Spk I	CGMN-SBC-BKG01-0-0000	40	30.0	75
C0081335 Spk J	CGMN-SBC-BKG01-0-0000	400	305	76
C0081336	CGMN-SBC-BKG01-0-0050	4	3.53	88
C0081336 Rep	CGMN-SBC-BKG01-0-0050	4	3.38	85
C0081336 Spk K	CGMN-SBC-BKG01-0-0050	40	32.3	81
C0081336 Spk L	CGMN-SBC-BKG01-0-0050	400	318	80
C0081338	CGMN-SBC-BKG01-0-0100	4	3.29	82
C0081338 Rep	CGMN-SBC-BKG01-0-0100	4	3.50	88
C0081338 Spk C	CGMN-SBC-BKG01-0-0100	40	35.4	89
C0081338 Spk D	CGMN-SBC-BKG01-0-0100	400	328	82
C0081339	CGMN-SBC-BKG01-DB-0100	4	3.41	85
C0081339 Rep	CGMN-SBC-BKG01-DB-0100	4	3.32	83
C0081339 Spk E	CGMN-SBC-BKG01-DB-0100	40	32.4	81
C0081339 Spk F	CGMN-SBC-BKG01-DB-0100	400	322	81
C0081340	CGMN-SBC-BKG01-0-0150	4	3.59	90
C0081340 Rep	CGMN-SBC-BKG01-0-0150	4	3.65	91
C0081340 Spk G	CGMN-SBC-BKG01-0-0150	40	34.4	86
C0081340 Spk H	CGMN-SBC-BKG01-0-0150	400	348	87
C0081341	CGMN-SBC-BKG01-0-0200	4	3.49	87
C0081341 Rep	CGMN-SBC-BKG01-0-0200	4	3.49	87
C0081341 Spk I	CGMN-SBC-BKG01-0-0200	40	35.0	88
C0081341 Spk J	CGMN-SBC-BKG01-0-0200	400	348	87
C0081347	CGMN-SBC-BKG02-0-0000	4	3.85	96
C0081347 Rep	CGMN-SBC-BKG02-0-0000	4	3.64	91
C0081347 Spk K	CGMN-SBC-BKG02-0-0000	40	33.9	85
C0081347 Spk L	CGMN-SBC-BKG02-0-0000	400	326	82

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081348	CGMN-SBC-BKG02-0-0050	4	3.61	90
C0081348 Rep	CGMN-SBC-BKG02-0-0050	4	3.47	87
C0081348 Spk C	CGMN-SBC-BKG02-0-0050	40	35.0	87
C0081348 Spk D	CGMN-SBC-BKG02-0-0050	400	323	81
C0081349	CGMN-SBC-BKG02-DB-0100	4	3.54	89
C0081349 Rep	CGMN-SBC-BKG02-DB-0100	4	3.45	86
C0081349 Spk E	CGMN-SBC-BKG02-DB-0100	40	35.7	89
C0081349 Spk F	CGMN-SBC-BKG02-DB-0100	400	339	85
C0081350	CGMN-SBC-BKG02-0-0100	4	3.46	86
C0081350 Rep	CGMN-SBC-BKG02-0-0100	4	3.45	86
C0081350 Spk G	CGMN-SBC-BKG02-0-0100	40	35.5	89
C0081350 Spk H	CGMN-SBC-BKG02-0-0100	400	338	85
C0081351	CGMN-SBC-BKG02-0-0150	4	3.50	87
C0081351 Rep	CGMN-SBC-BKG02-0-0150	4	3.42	85
C0081351 Spk I	CGMN-SBC-BKG02-0-0150	40	36.3	91
C0081351 Spk J	CGMN-SBC-BKG02-0-0150	400	332	83
C0081352	CGMN-SBC-BKG02-0-0200	4	3.46	87
C0081352 Rep	CGMN-SBC-BKG02-0-0200	4	3.45	86
C0081352 Spk K	CGMN-SBC-BKG02-0-0200	40	35.1	88
C0081352 Spk L	CGMN-SBC-BKG02-0-0200	400	321	80
C0081353	CGMN-SS-BKG01-0-0000	4	3.14	79
C0081353 Rep	CGMN-SS-BKG01-0-0000	4	3.02	76
C0081353 Spk C	CGMN-SS-BKG01-0-0000	40	30.6	77
C0081353 Spk D	CGMN-SS-BKG01-0-0000	400	283	71
C0081354	CGMN-SS-BKG01-0-0005	4	3.19	80
C0081354 Rep	CGMN-SS-BKG01-0-0005	4	3.28	82
C0081354 Spk E	CGMN-SS-BKG01-0-0005	40	32.0	80
C0081354 Spk F	CGMN-SS-BKG01-0-0005	400	306	76
C0081355	CGMN-SS-D601-0-0000	4	2.72	68
C0081355 Rep	CGMN-SS-D601-0-0000	4	2.91	73
C0081355 Spk G	CGMN-SS-D601-0-0000	40	27.8	70
C0081355 Spk H	CGMN-SS-D601-0-0000	400	248	62
C0081356	CGMN-SS-D601-0-0005	4	2.74	69
C0081356 Rep	CGMN-SS-D601-0-0005	4	2.87	72
C0081356 Spk I	CGMN-SS-D601-0-0005	40	27.7	69
C0081356 Spk J	CGMN-SS-D601-0-0005	400	273	68
C0081357	CGMN-SS-D601-DB-0005	4	2.74	69
C0081357 Rep	CGMN-SS-D601-DB-0005	4	2.65	66
C0081357 Spk K	CGMN-SS-D601-DB-0005	40	26.9	67
C0081357 Spk L	CGMN-SS-D601-DB-0005	400	278	70

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081365	CGMN-SS-B10201-0-0000	4	3.28	82
C0081365 Rep	CGMN-SS-B10201-0-0000	4	3.35	84
C0081365 Spk C	CGMN-SS-B10201-0-0000	40	30.6	77
C0081365 Spk D	CGMN-SS-B10201-0-0000	400	320	80
C0081366	CGMN-SS-B10201-0-0005	4	3.32	83
C0081366 Rep	CGMN-SS-B10201-0-0005	4	3.34	84
C0081366 Spk E	CGMN-SS-B10201-0-0005	40	32.7	82
C0081366 Spk F	CGMN-SS-B10201-0-0005	400	347	87
C0081367	CGMN-SS-B2201-0-0000	4	4.02	101
C0081367 Rep	CGMN-SS-B2201-0-0000	4	3.96	99
C0081367 Spk G	CGMN-SS-B2201-0-0000	40	35.5	89
C0081367 Spk H	CGMN-SS-B2201-0-0000	400	371	93
C0081368	CGMN-SS-B2201-0-0005	4	3.50	88
C0081368 Rep	CGMN-SS-B2201-0-0005	4	3.67	92
C0081368 Spk I	CGMN-SS-B2201-0-0005	40	37.6	94
C0081368 Spk J	CGMN-SS-B2201-0-0005	400	369	92
C0081369	CGMN-SS-B2201-DB-0005	4	3.61	90
C0081369 Rep	CGMN-SS-B2201-DB-0005	4	3.66	92
C0081369 Spk K	CGMN-SS-B2201-DB-0005	40	35.8	90
C0081369 Spk L	CGMN-SS-B2201-DB-0005	400	368	92
C0081370	CGMN-SS-B2501-0-0000	4	3.42	86
C0081370 Rep	CGMN-SS-B2501-0-0000	4	3.44	86
C0081370 Spk C	CGMN-SS-B2501-0-0000	40	37.8	95
C0081370 Spk D	CGMN-SS-B2501-0-0000	400	355	89
C0081371	CGMN-SS-B2501-0-0005	4	3.27	82
C0081371 Rep	CGMN-SS-B2501-0-0005	4	3.14	79
C0081371 Spk E	CGMN-SS-B2501-0-0005	40	33.8	85
C0081371 Spk F	CGMN-SS-B2501-0-0005	400	324	81
C0081372	CGMN-SS-B2601-0-0000	4	3.50	88
C0081372 Rep	CGMN-SS-B2601-0-0000	4	3.51	88
C0081372 Spk G	CGMN-SS-B2601-0-0000	40	36.7	92
C0081372 Spk H	CGMN-SS-B2601-0-0000	400	358	90
C0081373	CGMN-SS-B2601-0-0005	4	3.61	90
C0081373 Rep	CGMN-SS-B2601-0-0005	4	3.53	88
C0081373 Spk I	CGMN-SS-B2601-0-0005	40	36.2	91
C0081373 Spk J	CGMN-SS-B2601-0-0005	400	361	90
C0081375	CGMN-SS-B1602-0-0000	4	3.28	82
C0081375 Rep	CGMN-SS-B1602-0-0000	4	3.42	86
C0081375 Spk K	CGMN-SS-B1602-0-0000	40	31.3	78
C0081375 Spk L	CGMN-SS-B1602-0-0000	400	327	82

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081376	CGMN-SS-B1602-0-0005	4	3.08	77
C0081376 Rep	CGMN-SS-B1602-0-0005	4	3.00	75
C0081376 Spk C	CGMN-SS-B1602-0-0005	40	36.6	92
C0081376 Spk D	CGMN-SS-B1602-0-0005	400	339	85
C0081377	CGMN-SS-B11201-0-0000	4	3.22	81
C0081377 Rep	CGMN-SS-B11201-0-0000	4	3.15	79
C0081377 Spk E	CGMN-SS-B11201-0-0000	40	32.3	81
C0081377 Spk F	CGMN-SS-B11201-0-0000	400	322	81
C0081378	CGMN-SS-B11201-0-0005	4	3.05	76
C0081378 Rep	CGMN-SS-B11201-0-0005	4	3.16	79
C0081378 Spk G	CGMN-SS-B11201-0-0005	40	33.6	84
C0081378 Spk H	CGMN-SS-B11201-0-0005	400	357	89
C0081379	CGMN-SS-FTA01-0-0000	4	2.88	72
C0081379 Rep	CGMN-SS-FTA01-0-0000	4	3.01	75
C0081379 Spk I	CGMN-SS-FTA01-0-0000	40	27.8	70
C0081379 Spk J	CGMN-SS-FTA01-0-0000	400	278	70
C0081380	CGMN-SS-FTA01-0-0005	4	3.14	79
C0081380 Rep	CGMN-SS-FTA01-0-0005	4	3.03	76
C0081380 Spk K	CGMN-SS-FTA01-0-0005	40	29.8	75
C0081380 Spk L	CGMN-SS-FTA01-0-0005	400	314	79
C0081381	CGMN-SS-FTA01-DB-0005	4	3.23	81
C0081381 Rep	CGMN-SS-FTA01-DB-0005	4	3.26	82
C0081381 Spk C	CGMN-SS-FTA01-DB-0005	40	33.8	85
C0081381 Spk D	CGMN-SS-FTA01-DB-0005	400	335	84
C0081382	CGMN-SS-FTA02-0-0000	4	2.57	64
C0081382 Rep	CGMN-SS-FTA02-0-0000	4	2.68	67
C0081382 Spk E	CGMN-SS-FTA02-0-0000	40	30.4	76
C0081382 Spk F	CGMN-SS-FTA02-0-0000	400	272	68
C0081383	CGMN-SS-FTA02-0-0005	4	3.02	76
C0081383 Rep	CGMN-SS-FTA02-0-0005	4	3.08	77
C0081383 Spk G	CGMN-SS-FTA02-0-0005	40	30.2	76
C0081383 Spk H	CGMN-SS-FTA02-0-0005	400	314	79
C0081385	CGMN-SS-B6801-0-0000	4	2.52	63
C0081385 Rep	CGMN-SS-B6801-0-0000	4	2.71	68
C0081385 Spk I	CGMN-SS-B6801-0-0000	40	34.6	87
C0081385 Spk J	CGMN-SS-B6801-0-0000	400	342	86
C0081386	CGMN-SS-B6801-DB-0000	4	2.67	67
C0081386 Rep	CGMN-SS-B6801-DB-0000	4	2.46	62
C0081386 Spk K	CGMN-SS-B6801-DB-0000	40	32.6	82
C0081386 Spk L	CGMN-SS-B6801-DB-0000	400	328	82

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	^{13}C-PFOA Amount Recovered (ng/g)	^{13}C-PFOA Recovery (%)
C0081387	CGMN-SS-B6801-0-0005	4	2.89	72
C0081387 Rep	CGMN-SS-B6801-0-0005	4	2.82	71
C0081387 Spk C	CGMN-SS-B6801-0-0005	40	36.2	91
C0081387 Spk D	CGMN-SS-B6801-0-0005	400	342	86
C0081392	CGMN-SS-B1601-0-0000	4	3.50	88
C0081392 Rep	CGMN-SS-B1601-0-0000	4	3.58	90
C0081392 Spk E	CGMN-SS-B1601-0-0000	40	38.9	97
C0081392 Spk F	CGMN-SS-B1601-0-0000	400	366	91
C0081393	CGMN-SS-B1601-0-0005	4	3.20	80
C0081393 Rep	CGMN-SS-B1601-0-0005	4	3.30	83
C0081393 Spk G	CGMN-SS-B1601-0-0005	40	35.8	90
C0081393 Spk H	CGMN-SS-B1601-0-0005	400	353	88
C0081395	CGMN-SS-IC04-0-0000	4	3.12	78
C0081395 Rep	CGMN-SS-IC04-0-0000	4	3.42	86
C0081395 Spk I	CGMN-SS-IC04-0-0000	40	34.0	85
C0081395 Spk J	CGMN-SS-IC04-0-0000	400	324	81
C0081396	CGMN-SS-IC04-0-0005	4	2.99	75
C0081396 Rep	CGMN-SS-IC04-0-0005	4	3.10	78
C0081396 Spk K	CGMN-SS-IC04-0-0005	40	31.0	78
C0081396 Spk L	CGMN-SS-IC04-0-0005	400	320	80
C0081397	CGMN-SS-IC03-0-0000	4	3.70	93
C0081397 Rep	CGMN-SS-IC03-0-0000	4	3.38	85
C0081397 Spk C	CGMN-SS-IC03-0-0000	40	39.0	98
C0081397 Spk D	CGMN-SS-IC03-0-0000	400	335	84
C0081398	CGMN-SS-IC03-0-0005	4	3.52	88
C0081398 Rep	CGMN-SS-IC03-0-0005	4	3.09	77
C0081398 Spk E	CGMN-SS-IC03-0-0005	40	31.5	79
C0081398 Spk F	CGMN-SS-IC03-0-0005	400	290	73
C0081399	CGMN-SS-IC01-0-0000	4	3.90	98
C0081399 Rep	CGMN-SS-IC01-0-0000	4	3.60	90
C0081399 Spk G	CGMN-SS-IC01-0-0000	40	37.7	94
C0081399 Spk H	CGMN-SS-IC01-0-0000	400	342	86
C0081400	CGMN-SS-IC01-0-0005	4	3.25	81
C0081400 Rep	CGMN-SS-IC01-0-0005	4	3.33	83
C0081400 Spk I	CGMN-SS-IC01-0-0005	40	33.3	83
C0081400 Spk J	CGMN-SS-IC01-0-0005	400	293	73
C0081401	CGMN-SS-IC02-0-0000	4	3.22	81
C0081401 Rep	CGMN-SS-IC02-0-0000	4	3.42	86
C0081401 Spk K	CGMN-SS-IC02-0-0000	40	30.5	76
C0081401 Spk L	CGMN-SS-IC02-0-0000	400	268	67

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Soil Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0081402	CGMN-SS-IC02-0-0005	4	3.79	95
C0081402 Rep	CGMN-SS-IC02-0-0005	4	3.58	90
C0081402 Spk C	CGMN-SS-IC02-0-0005	40	34.2	86
C0081402 Spk D	CGMN-SS-IC02-0-0005	400	390	98
C0081403	CGMN-SS-D503-0-0000	4	3.98	100
C0081403 Rep	CGMN-SS-D503-0-0000	4	3.43	86
C0081403 Spk E	CGMN-SS-D503-0-0000	40	37.2	93
C0081403 Spk F	CGMN-SS-D503-0-0000	400	334	84
C0081404	CGMN-SS-D503-0-0005	4	3.71	93
C0081404 Rep	CGMN-SS-D503-0-0005	4	3.51	88
C0081404 Spk G	CGMN-SS-D503-0-0005	40	37.4	94
C0081404 Spk H	CGMN-SS-D503-0-0005	400	374	94
C0081405	CGMN-SS-D501-0-0000	4	3.30	83
C0081405 Rep	CGMN-SS-D501-0-0000	4	3.07	77
C0081405 Spk I	CGMN-SS-D501-0-0000	40	35.9	90
C0081405 Spk J	CGMN-SS-D501-0-0000	400	314	79
C0081406	CGMN-SS-D501-0-0005	4	2.07	52
C0081406 Rep	CGMN-SS-D501-0-0005	4	1.98	50
C0081406 Spk K	CGMN-SS-D501-0-0005	40	36.2	91
C0081406 Spk L	CGMN-SS-D501-0-0005	400	330	83
C0081407	CGMN-SS-B801-0-0000	4	3.23	81
C0081407 Rep	CGMN-SS-B801-0-0000	4	3.03	76
C0081407 Spk C	CGMN-SS-B801-0-0000	40	32.1	80
C0081407 Spk D	CGMN-SS-B801-0-0000	400	274	69
C0081408	CGMN-SS-B801-0-0005	4	2.83	71
C0081408 Rep	CGMN-SS-B801-0-0005	4	2.84	71
C0081408 Spk E	CGMN-SS-B801-0-0005	40	27.5	69
C0081408 Spk F	CGMN-SS-B801-0-0005	400	305	76
C0081409	CGMN-SS-D502-0-0000	4	2.77	69
C0081409 Rep	CGMN-SS-D502-0-0000	4	3.07	77
C0081409 Spk G	CGMN-SS-D502-0-0000	40	28.3	71
C0081409 Spk H	CGMN-SS-D502-0-0000	400	310	78
C0081410	CGMN-SS-D502-0-0005	4	3.27	82
C0081410 Rep	CGMN-SS-D502-0-0005	4	3.61	90
C0081410 Spk I	CGMN-SS-D502-0-0005	40	32.2	81
C0081410 Spk J	CGMN-SS-D502-0-0005	400	328	82
			Average:	79
			Standard Deviation:	12

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IX. Surrogate Spike Recovery of ^{13}C PFOA in Ground Water Samples

Exygen ID	Sample Description	Amount Spiked (ng/L)	^{13}C-PFOA Amount Recovered (ng/L)	Recovery (%)
C0081224 Spk C	CGMN-GW-PW7-0-050516	1500	1300	87
C0081224 Spk D	CGMN-GW-PW7-0-050516	5500	4840	88
C0081224	CGMN-GW-PW7-0-050516	500	418	84
C0081224 Rep	CGMN-GW-PW7-0-050516	500	342	68
C0081225	CGMN-GW-PW7-DP-050516	500	125	25
C0081226	CGMN-GW-PW7-LS-050516	1000	1120	112
C0081227	CGMN-GW-PW7-HS-050516	5000	5390	108
C0081228 Spk E	CGMN-GW-MW8-0-050516	600	287	48
C0081228 Spk F	CGMN-GW-MW8-0-050516	1000	647	65
C0081228	CGMN-GW-MW8-0-050516	500	164	33
C0081228 Rep	CGMN-GW-MW8-0-050516	500	134	27
C0081229	CGMN-GW-MW8-DP-050516	500	230	46
C0081230	CGMN-GW-MW8-LS-050516	100	274	274
C0081231	CGMN-GW-MW8-HS-050516	500	628	126
C0081232 Spk G	CGMN-GW-MW19-0-050517	1000	NR	NR
C0081232 Spk H	CGMN-GW-MW19-0-050517	1500	NR	NR
C0081232	CGMN-GW-MW19-0-050517	500	NR	NR
C0081232 Rep	CGMN-GW-MW19-0-050517	500	NR	NR
C0081233	CGMN-GW-MW19-DP-050517	500	NR	NR
C0081234	CGMN-GW-MW19-LS-050517	500	NR	NR
C0081235	CGMN-GW-MW19-HS-050517	1000	NR	NR
C0081265 Spk C	CGMN-GW-DECON-0-050524	600	575	96
C0081265 Spk D	CGMN-GW-DECON-0-050524	5500	5200	95
C0081265	CGMN-GW-DECON-0-050524	500	424	85
C0081265 Rep	CGMN-GW-DECON-0-050524	500	362	72
C0081266	CGMN-GW-DECON-DP-050524	500	409	82
C0081267	CGMN-GW-DECON-LS-050524	100	102	102
C0081268	CGMN-GW-DECON-HS-050524	5000	4520	90
C0081411 Spk E	WBMN-GW-R1-0-050512	1500	1360	91
C0081411 Spk F	WBMN-GW-R1-0-050512	10500	10600	101
C0081411	WBMN-GW-R1-0-050512	500	401	80
C0081411 Rep	WBMN-GW-R1-0-050512	500	393	79
C0081412	WBMN-GW-R1-DP-050512	500	395	79
C0081413	WBMN-GW-R1-LS-050512	1000	833	83
C0081415	WBMN-GW-R1-HS-050512	10000	9520	95
C0081416 Spk C	WBMN-GW-R2-0-050512	1500	1380	91
C0081416 Spk D	WBMN-GW-R2-0-050512	10500	9710	92
C0081416	WBMN-GW-R2-0-050512	500	447	89
C0081416 Rep	WBMN-GW-R2-0-050512	500	401	80
C0081417	WBMN-GW-R2-DP-050512	500	503	101
C0081418	WBMN-GW-R2-LS-050512	1000	1020	102
C0081419	WBMN-GW-R2-HS-050512	10000	8660	87

NR = Not reported due to quality control result failures.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IX. Surrogate Spike Recovery of ^{13}C PFOA in Ground Water Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery (%)
C0081420 Spk E	WBMN-GW-R3-0-050512	1500	1230	82
C0081420 Spk F	WBMN-GW-R3-0-050512	10500	8660	82
C0081420	WBMN-GW-R3-0-050512	500	381	76
C0081420 Rep	WBMN-GW-R3-0-050512	500	356	71
C0081421	WBMN-GW-R3-DP-050512	500	411	82
C0081422	WBMN-GW-R3-LS-050512	1000	1000	100
C0081423	WBMN-GW-R3-HS-050512	10000	8920	89
C0081424 Spk G	WBMN-GW-R4-0-050512	10500	8760	83
C0081424 Spk H	WBMN-GW-R4-0-050512	100500	80700	80
C0081424	WBMN-GW-R4-0-050512	500	359	72
C0081424 Rep	WBMN-GW-R4-0-050512	500	332	66
C0081425	WBMN-GW-R4-DP-050512	500	366	73
C0081426	WBMN-GW-R4-LS-050512	10000	9090	91
C0081427	WBMN-GW-R4-HS-050512	100000	82300	82
C0081428 Spk C	WBMN-GW-CWM-0-050512	1500	1330	89
C0081428 Spk D	WBMN-GW-CWM-0-050512	10500	9440	90
C0081428	WBMN-GW-CWM-0-050512	500	443	89
C0081428 Rep	WBMN-GW-CWM-0-050512	500	364	73
C0081429	WBMN-GW-CWM-DP-050512	500	405	81
C0081430	WBMN-GW-CWM-LS-050512	1000	959	96
C0081431	WBMN-GW-CWM-HS-050512	10000	10500	105
C0081432 Spk E	WBMN-GW-CWD01-0-050512	1500	1280	85
C0081432 Spk F	WBMN-GW-CWD01-0-050512	10500	8370	80
C0081432	WBMN-GW-CWD01-0-050512	500	354	71
C0081432 Rep	WBMN-GW-CWD01-0-050512	500	330	66
C0081433	WBMN-GW-CWD01-DP-050512	500	408	82
C0081434	WBMN-GW-CWD01-LS-050512	1000	787	79
C0081435	WBMN-GW-CWD01-HS-050512	10000	6680	67
C0081436	WBMN-GW-TRIP-0-050511	500	434	87
C0081437	WBMN-GW-TRIP-LS-050511	100	104	104
C0081438	WBMN-GW-TRIP-HS-050511	1000	899	90
			Average:	83
			Standard Deviation:	30

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table X. Surrogate Spike Recovery of ^{13}C PFOA in Rinse Blank Samples

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery (%)
C0081204	CGMN-SBC-D104-RB-0400	500	372	74
C0081218	CGMN-SBC-D103-RB-0250	500	382	76
C0081237	CGMN-SBC-D103-RB-0500	500	421	84
C0081337	CGMN-SBC-BKG01-RB-0200	500	414	83
C0081364	CGMN-SS-D101-RB-0005	500	418	84
C0081384	CGMN-SS-FTA01-RB-0005	500	361	72
C0081394	CGMN-SS-B6801-RB-0000	500	368	74
C0081261	CGMN-SBC-FTA03-RB-0100	500	373	75
C0081276	CGMN-SBC-D101-RB-0150	500	415	83
			Average:	78
			Standard Deviation:	5

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table XI. Total Percent Solids for Soil Samples

Exygen ID	Client Sample ID	Total Solids (%)
C0081163	CGMN-SBC-D203-0-0000	81.70
C0081164	CGMN-SBC-D203-0-0050	73.84
C0081165	CGMN-SBC-D203-0-0100	60.97
C0081166	CGMN-SBC-D203-0-0150	41.52
C0081167	CGMN-SBC-D203-0-0200	51.35
C0081168	CGMN-SBC-D203-0-0250	92.22
C0081169	CGMN-SBC-D203-0-0300	92.46
C0081170	CGMN-SBC-D203-DB-0300	91.81
C0081171	CGMN-SBC-D203-0-0350	97.29
C0081172	CGMN-SBC-D203-0-0400	98.10
C0081173	CGMN-SBC-D203-0-0450	97.14
C0081174	CGMN-SBC-D202-0-0000	72.55
C0081175	CGMN-SBC-D202-0-0050	52.15
C0081176	CGMN-SBC-D202-0-0100	78.26
C0081177	CGMN-SBC-D202-0-0150	54.16
C0081178	CGMN-SBC-D202-0-0200	78.50
C0081179	CGMN-SBC-D202-0-0250	90.93
C0081180	CGMN-SBC-D202-0-0300	94.54
C0081181	CGMN-SBC-D202-0-0350	95.34
C0081182	CGMN-SBC-D202-DB-0350	94.57
C0081183	CGMN-SBC-D202-0-0400	97.10
C0081184	CGMN-SBC-D202-0-0450	92.20
C0081185	CGMN-SBC-D201-0-0000	89.84

Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081186	CGMN-SBC-D201-0-0050	86.87
C0081187	CGMN-SBC-D201-0-0100	90.92
C0081188	CGMN-SBC-D201-DB-0100	90.37
C0081189	CGMN-SBC-D201-0-0150	56.09
C0081190	CGMN-SBC-D201-0-0200	85.46
C0081191	CGMN-SBC-D201-0-0250	87.06
C0081192	CGMN-SBC-D201-0-0300	92.97
C0081193	CGMN-SBC-D201-0-0350	97.14
C0081194	CGMN-SBC-D201-0-0400	98.46
C0081195	CGMN-SBC-D104-0-0000	83.93
C0081196	CGMN-SBC-D104-0-0050	83.50
C0081197	CGMN-SBC-D104-DB-0050	83.68
C0081198	CGMN-SBC-D104-0-0100	95.51
C0081199	CGMN-SBC-D104-0-0150	90.98
C0081200	CGMN-SBC-D104-0-0200	83.04
C0081201	CGMN-SBC-D104-0-0250	84.27
C0081202	CGMN-SBC-D104-0-0300	97.45
C0081203	CGMN-SBC-D104-0-0350	96.15
C0081205	CGMN-SBC-D104-0-0400	97.83
C0081206	CGMN-SBC-D104-0-0450	97.55
C0081207	CGMN-SBC-D104-DB-0450	97.42
C0081208	CGMN-SBC-D104-0-0500	95.80
C0081209	CGMN-SBC-D104-0-0550	96.12

Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081210	CGMN-SBC-D104-0-0600	97.11
C0081211	CGMN-SBC-D104-0-0650	96.19
C0081212	CGMN-SBC-D103-0-0000	87.89
C0081213	CGMN-SBC-D103-0-0050	87.26
C0081214	CGMN-SBC-D103-0-0100	91.87
C0081215	CGMN-SBC-D103-0-0150	93.94
C0081216	CGMN-SBC-D103-DB-0150	93.76
C0081217	CGMN-SBC-D103-0-0200	91.87
C0081219	CGMN-SBC-D103-0-0250	84.92
C0081220	CGMN-SBC-D103-0-0300	93.88
C0081221	CGMN-SBC-D103-0-0350	95.89
C0081222	CGMN-SBC-D103-0-0400	96.84
C0081236	CGMN-SBC-D103-0-0450	96.46
C0081238	CGMN-SBC-D103-0-0500	97.27
C0081239	CGMN-SBC-D103-0-0550	96.92
C0081240	CGMN-SBC-D103-0-0600	97.47
C0081241	CGMN-SBC-D103-0-0650	97.59
C0081242	CGMN-SBC-D501-0-0000	92.45
C0081243	CGMN-SBC-D501-0-0050	83.12
C0081244	CGMN-SBC-D501-DB-0050	85.04
C0081245	CGMN-SBC-D501-0-0100	87.27
C0081246	CGMN-SBC-D501-0-0150	95.64
C0081247	CGMN-SBC-D501-0-0200	95.99

Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081248	CGMN-SBC-D801-0-0000	85.66
C0081249	CGMN-SBC-D801-0-0050	77.94
C0081250	CGMN-SBC-D801-0-0100	74.82
C0081251	CGMN-SBC-D801-0-0150	75.84
C0081252	CGMN-SBC-D801-0-0200	77.16
C0081253	CGMN-SBC-FTA02-0-0000	86.80
C0081254	CGMN-SBC-FTA02-0-0050	95.75
C0081255	CGMN-SBC-FTA02-DB-0100	95.54
C0081256	CGMN-SBC-FTA02-0-0100	95.68
C0081257	CGMN-SBC-FTA02-0-0150	96.12
C0081258	CGMN-SBC-FTA02-0-0200	97.02
C0081259	CGMN-SBC-FTA03-0-0000	81.97
C0081260	CGMN-SBC-FTA03-0-0100	95.05
C0081262	CGMN-SBC-FTA03-0-0100	96.30
C0081263	CGMN-SBC-FTA03-0-0150	97.64
C0081264	CGMN-SBC-FTA03-0-0200	91.72
C0081269	CGMN-SBC-FTA01-0-0000	78.28
C0081270	CGMN-SBC-FTA01-0-0050	96.03
C0081271	CGMN-SBC-FTA01-0-0100	95.77
C0081272	CGMN-SBC-FTA02-0-0150	97.07
C0081273	CGMN-SBC-FTA02-0-0200	96.64
C0081274	CGMN-SBC-D101-0-0000	83.44
C0081275	CGMN-SBC-D101-0-0050	90.49

Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081277	CGMN-SBC-D101-0-0100	96.10
C0081278	CGMN-SBC-D101-DB-0100	96.32
C0081279	CGMN-SBC-D101-0-0150	97.23
C0081280	CGMN-SBC-D101-0-0200	97.62
C0081281	CGMN-SBC-D102-0-0000	82.22
C0081282	CGMN-SBC-D102-0-0050	90.33
C0081283	CGMN-SBC-D102-0-0100	97.66
C0081284	CGMN-SBC-D102-0-0150	97.52
C0081285	CGMN-SBC-D102-0-0200	97.71
C0081329	CGMN-SBC-WPA01-0-0000	85.53
C0081330	CGMN-SBC-WPA01-0-0050	90.31
C0081331	CGMN-SBC-WPA01-0-0100	86.85
C0081332	CGMN-SBC-WPA01-DB-0100	87.30
C0081333	CGMN-SBC-WPA01-0-0150	87.10
C0081334	CGMN-SBC-WPA01-0-0200	79.75
C0081335	CGMN-SBC-BKG01-0-0000	94.91
C0081336	CGMN-SBC-BKG01-0-0050	95.58
C0081338	CGMN-SBC-BKG01-0-0100	88.98
C0081339	CGMN-SBC-BKG01-DB-0100	88.19
C0081340	CGMN-SBC-BKG01-0-0150	89.67
C0081341	CGMN-SBC-BKG01-0-0200	92.88
C0081342	CGMN-SBC-B1501-0-0000	93.16
C0081343	CGMN-SBC-B1501-0-0050	94.09

Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081344	CGMN-SBC-B1501-0-0100	95.23
C0081345	CGMN-SBC-B1501-0-0150	94.22
C0081346	CGMN-SBC-B1501-0-0200	91.97
C0081347	CGMN-SBC-BKG02-0-0000	94.20
C0081348	CGMN-SBC-BKG02-0-0050	94.79
C0081349	CGMN-SBC-BKG02-DB-0100	95.75
C0081350	CGMN-SBC-BKG02-0-0100	95.96
C0081351	CGMN-SBC-BKG02-0-0150	95.98
C0081352	CGMN-SBC-BKG02-0-0200	94.36
C0081353	CGMN-SS-BKG01-0-0000	83.49
C0081354	CGMN-SS-BKG01-0-0005	90.25
C0081355	CGMN-SS-D601-0-0000	71.82
C0081356	CGMN-SS-D601-0-0005	83.00
C0081357	CGMN-SS-D601-DB-0005	82.50
C0081358	CGMN-SS-D101-0-0005	86.88
C0081359	CGMN-SS-D101-DB-0005	87.06
C0081360	CGMN-SS-D201-0-0000	74.02
C0081361	CGMN-SS-D201-0-0005	75.73
C0081362	CGMN-SS-D202-0-0000	88.36
C0081363	CGMN-SS-D202-0-0005	90.40
C0081365	CGMN-SS-B10201-0-0000	88.01
C0081366	CGMN-SS-B10201-0-0005	91.76
C0081367	CGMN-SS-B2201-0-0000	91.49

Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081368	CGMN-SS-B2201-0-0005	90.23
C0081369	CGMN-SS-B2201-DB-0005	90.35
C0081370	CGMN-SS-B2501-0-0000	92.30
C0081371	CGMN-SS-B2501-0-0005	93.11
C0081372	CGMN-SS-B2601-0-0000	94.05
C0081373	CGMN-SS-B2601-0-0005	90.45
C0081374	CGMN-SS-D101-0-0000	84.08
C0081375	CGMN-SS-B1602-0-0000	90.45
C0081376	CGMN-SS-B1602-0-0005	93.07
C0081377	CGMN-SS-B11201-0-0000	83.68
C0081378	CGMN-SS-B11201-0-0005	90.93
C0081379	CGMN-SS-FTA01-0-0000	76.47
C0081380	CGMN-SS-FTA01-0-0005	80.76
C0081381	CGMN-SS-FTA01-DB-0005	81.33
C0081382	CGMN-SS-FTA02-0-0000	75.06
C0081383	CGMN-SS-FTA02-0-0005	75.84
C0081385	CGMN-SS-B6801-0-0000	87.44
C0081386	CGMN-SS-B6801-DB-0000	87.44
C0081387	CGMN-SS-B6801-0-0005	91.15
C0081388	CGMN-SS-B1502-0-0000	91.07
C0081389	CGMN-SS-B1502-0-0005	92.87
C0081390	CGMN-SS-B1501-0-0000	93.19
C0081391	CGMN-SS-B1501-0-0005	94.32

Table XI. Total Percent Solids for Soil Samples Continued

Exygen ID	Client Sample ID	Total Solids (%)
C0081392	CGMN-SS-B1601-0-0000	94.42
C0081393	CGMN-SS-B1601-0-0005	85.94
C0081395	CGMN-SS-IC04-0-0000	86.57
C0081396	CGMN-SS-IC04-0-0005	92.70
C0081397	CGMN-SS-IC03-0-0000	80.68
C0081398	CGMN-SS-IC03-0-0005	87.72
C0081399	CGMN-SS-IC01-0-0000	87.21
C0081400	CGMN-SS-IC01-0-0005	89.80
C0081401	CGMN-SS-IC02-0-0000	78.12
C0081402	CGMN-SS-IC02-0-0005	91.41
C0081403	CGMN-SS-D503-0-0000	81.97
C0081404	CGMN-SS-D503-0-0005	89.70
C0081405	CGMN-SS-D501-0-0000	84.61
C0081406	CGMN-SS-D501-0-0005	87.43
C0081407	CGMN-SS-B801-0-0000	80.97
C0081408	CGMN-SS-B801-0-0005	83.25
C0081409	CGMN-SS-D502-0-0000	84.71
C0081410	CGMN-SS-D502-0-0005	86.22

FIGURES

Figure 1. Typical Calibration Curve for PFOA in Reagent Water

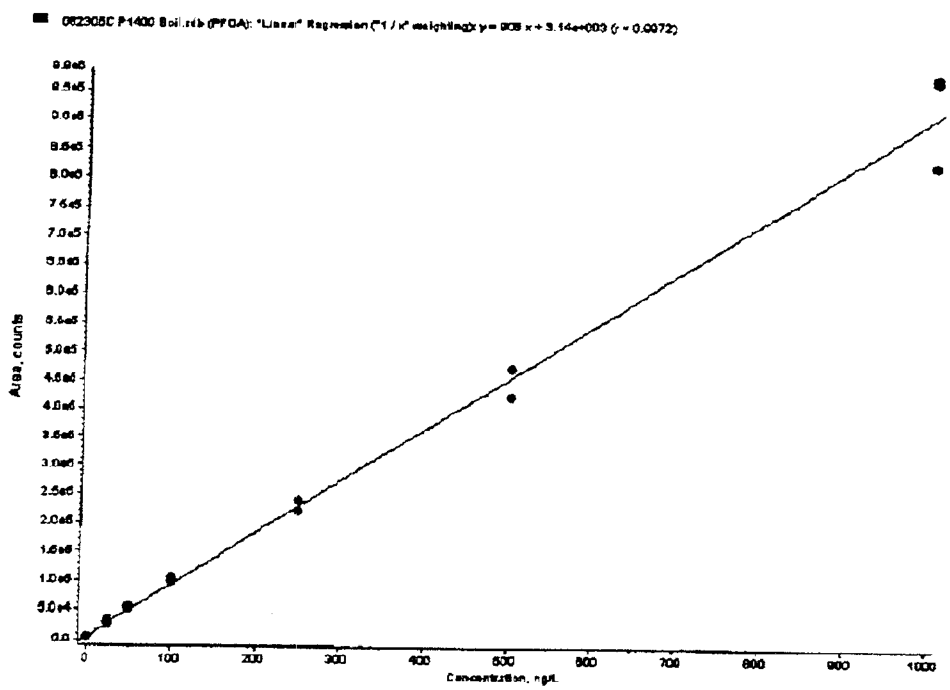
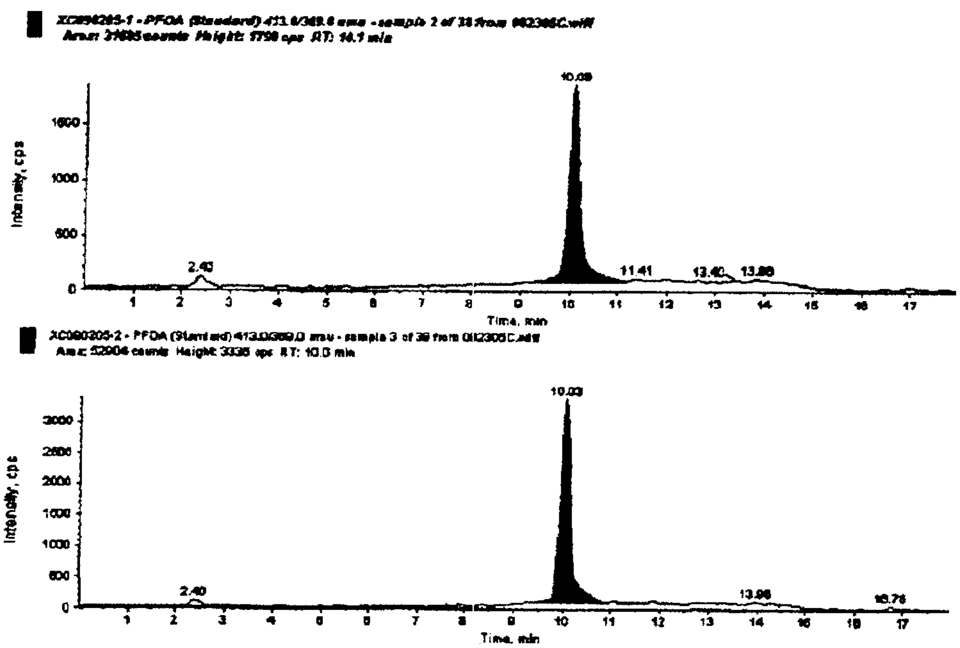


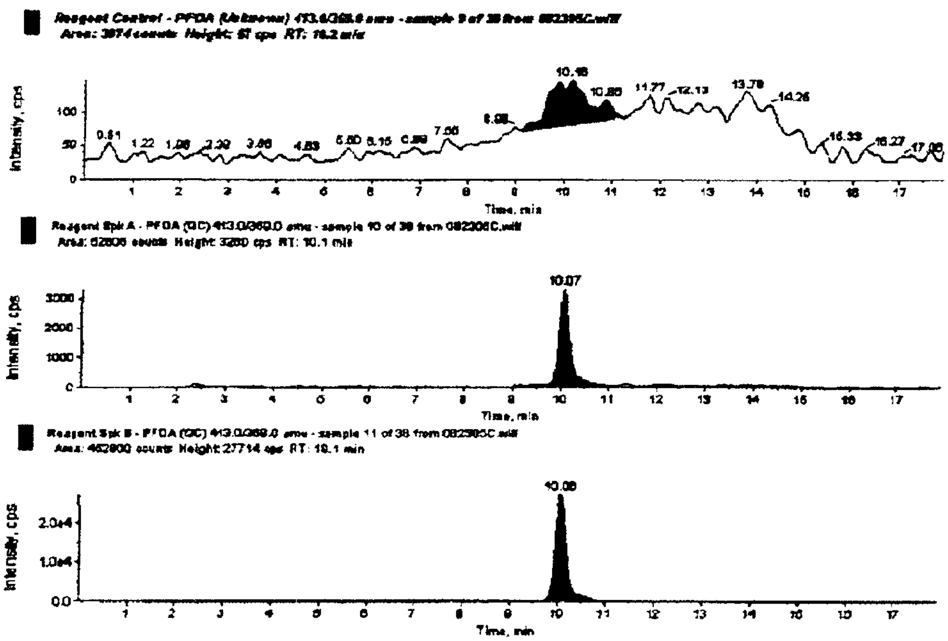
Figure 2. Extracted Standards of PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively



3MA01552134

2095.0357

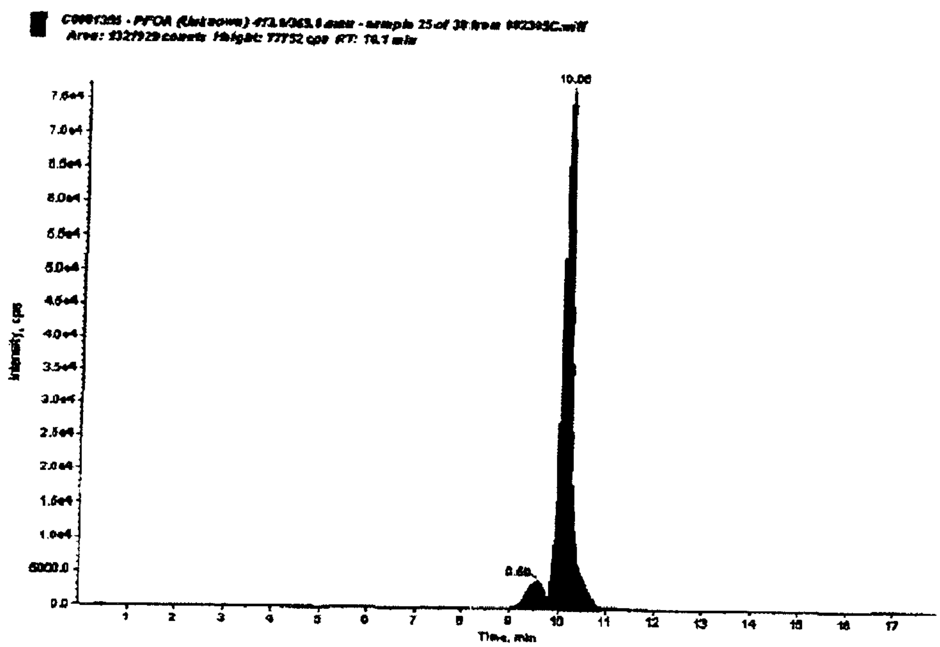
Figure 3. PFOA in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



3MA01552135

2095.0358

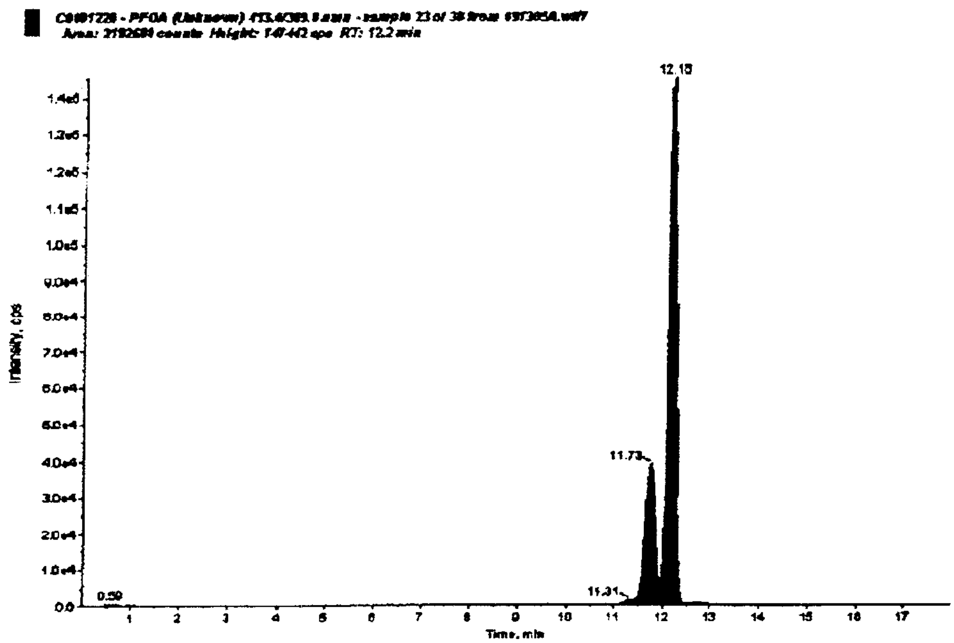
Figure 4. Chromatogram Representing a Soil Sample Analyzed for PFOA (Exygen ID: C0081355, Data Set: 082305C)



3MA01552136

2095.0359

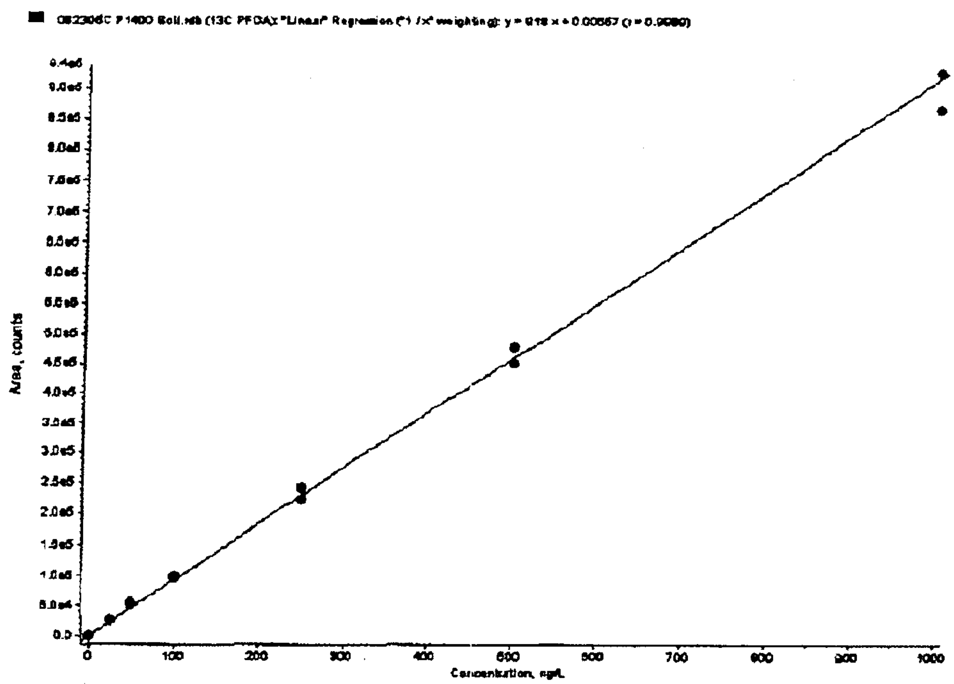
Figure 5. Chromatogram Representing a Ground Water Sample Analyzed for PFOA (Exygen ID: C0081228, Data Set: 091305A)



3MA01552137

2095.0360

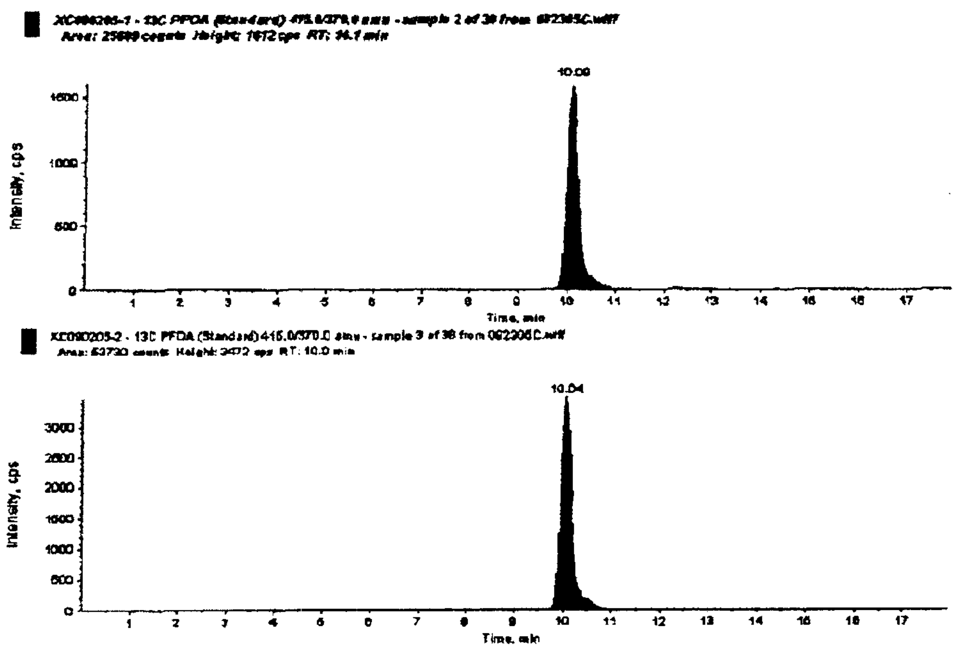
Figure 6. Typical Calibration Curve for ^{13}C PFOA in Reagent Water



3MA01552138

2095.0361

Figure 7. Extracted Standards of ^{13}C PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively



3MA01552139

2095.0362

Figure 8. ^{13}C PFOA in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively

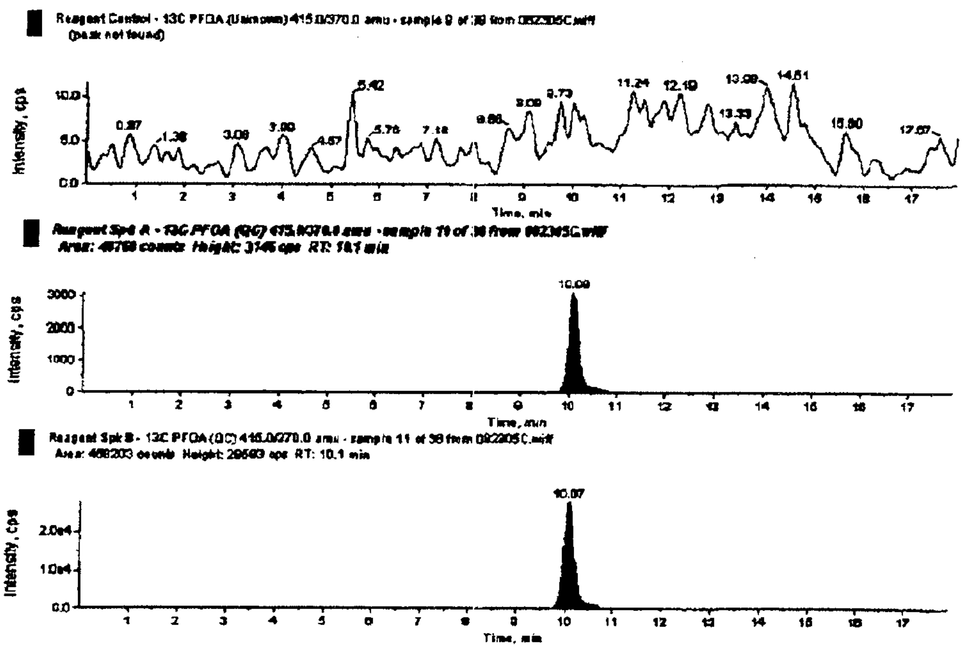


Figure 9. Chromatogram Representing a Soil Sample Analyzed for ^{13}C PFOA (Exygen ID: C0081355, Data Set: 082305C)

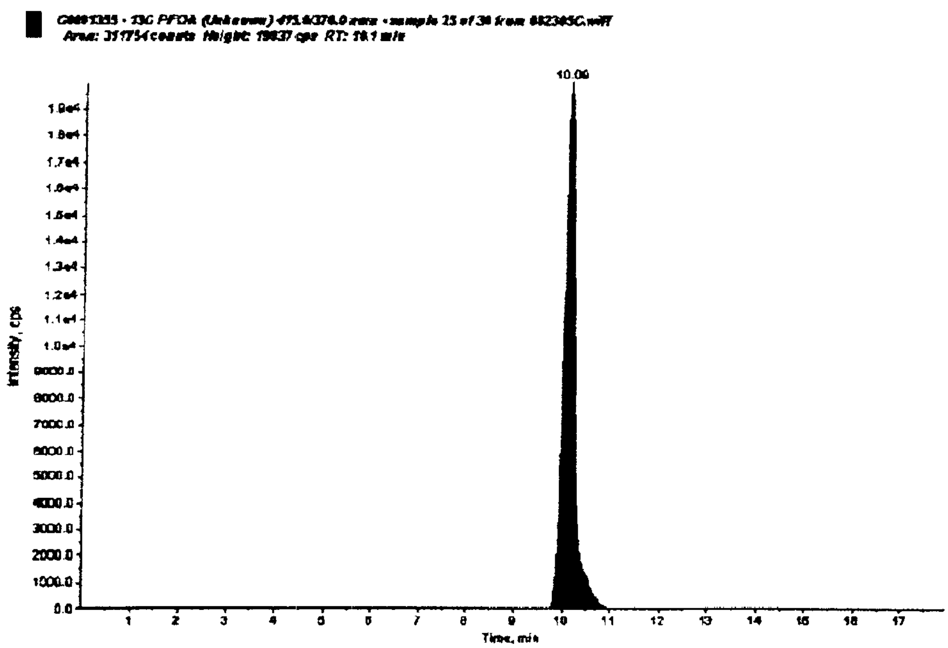


Figure 10. Chromatogram Representing a Ground Water Sample Analyzed for ^{13}C PFOA (Exygen ID: C0081228, Data Set: 091305A)

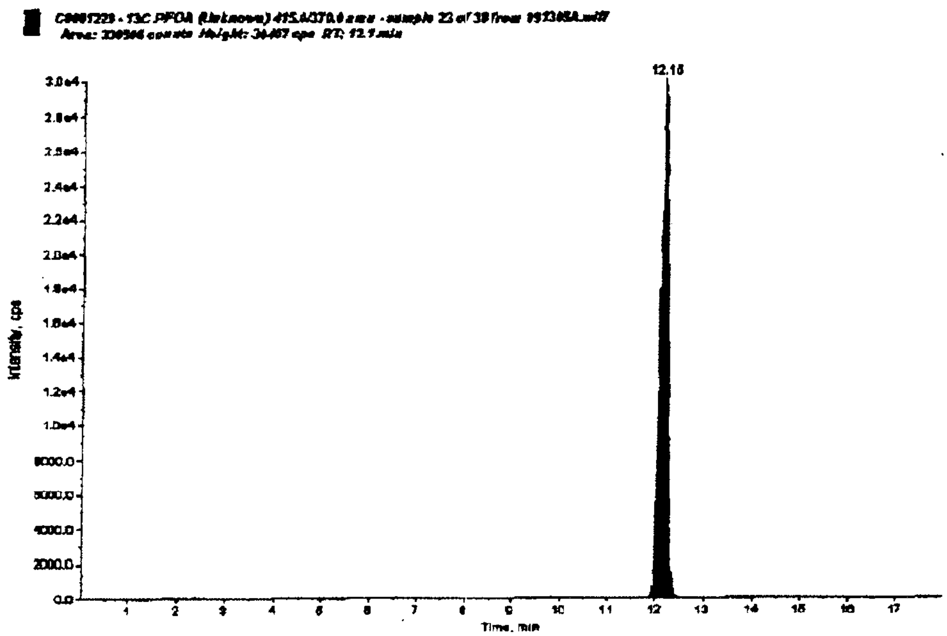


Figure 11. Typical Calibration Curve for PFBS in Reagent Water

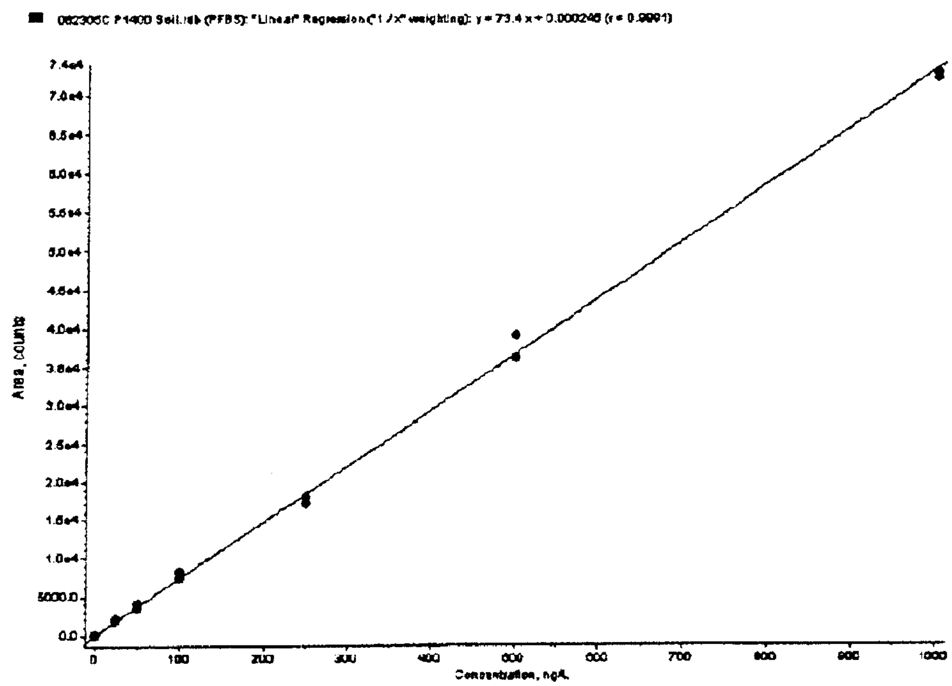


Figure 12. Extracted Standards of PFBS in Reagent Water, 25 ng/L and 50 ng/L, Respectively

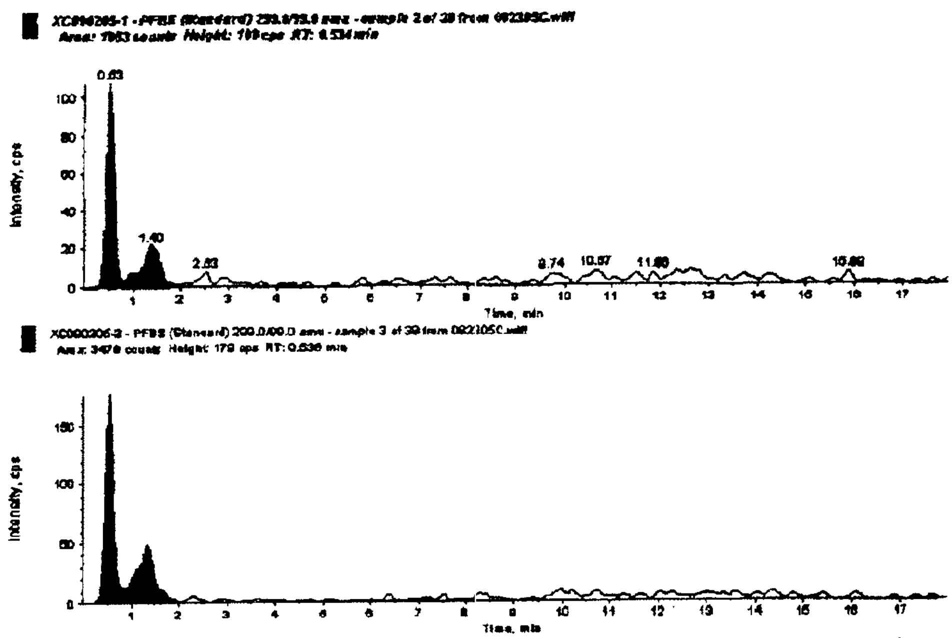
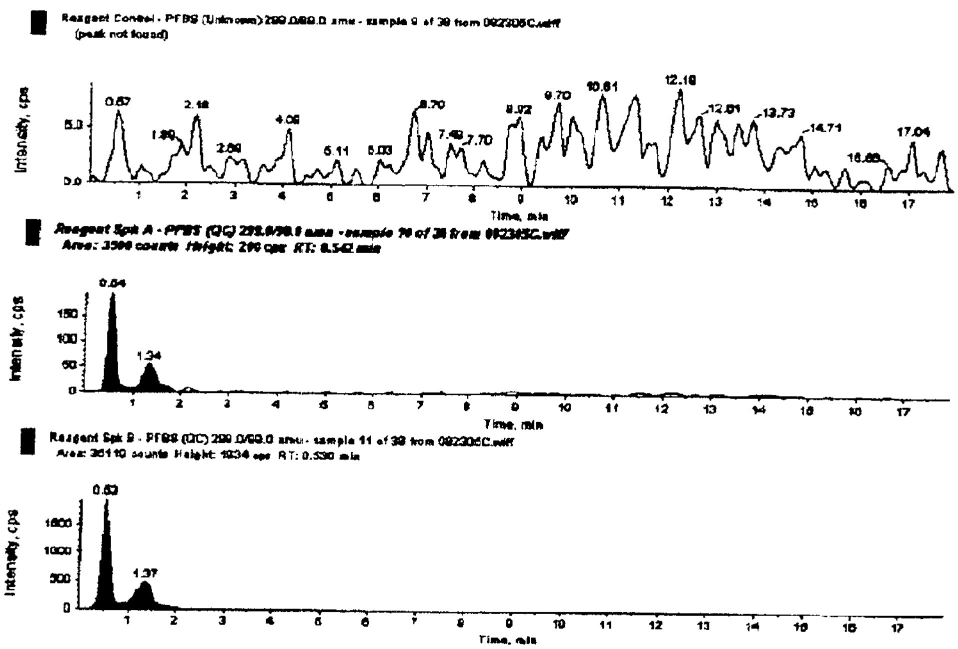


Figure 13. PFBS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



3MA01552145

2095.0368

Figure 14. Chromatogram Representing a Soil Sample Analyzed for PFBS (Exygen ID: C0081355, Data Set: 082305C)

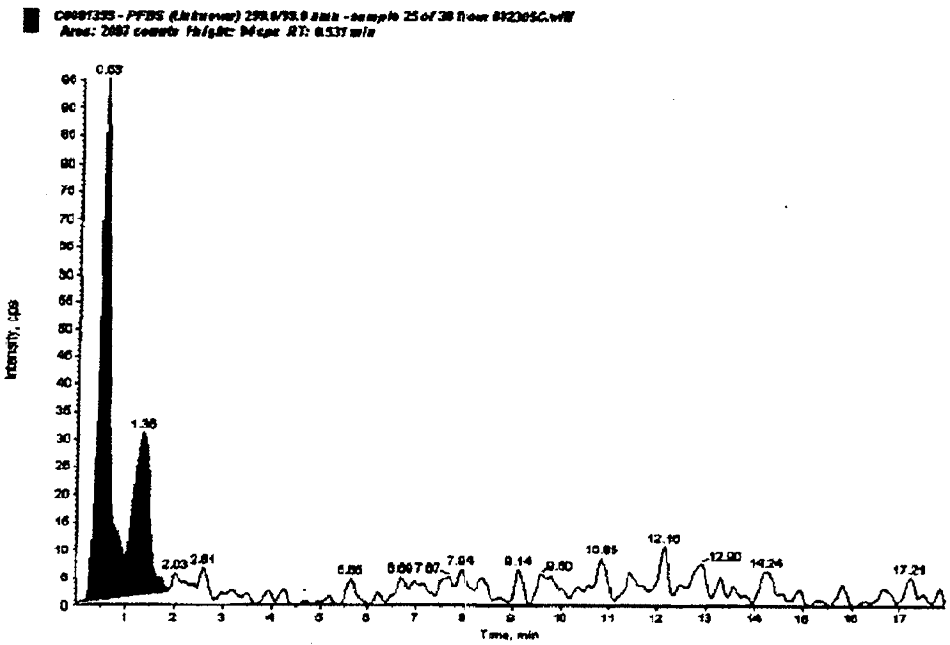


Figure 15. Chromatogram Representing a Ground Water Sample Analyzed for PFBS (Exygen ID: C0081228, Data Set: 091305A)

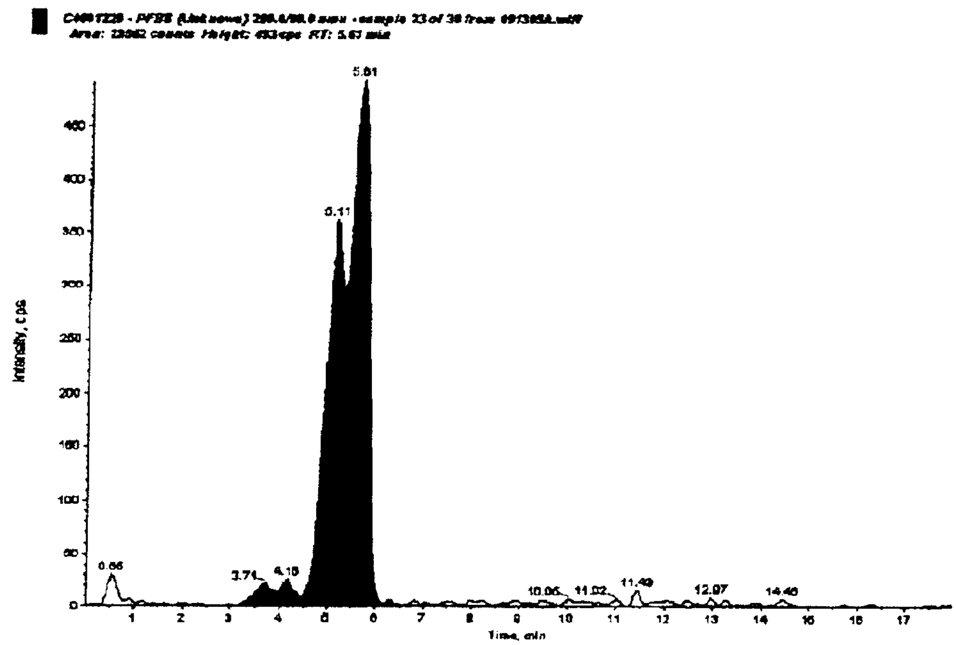


Figure 16. Typical Calibration Curve for PFHS in Reagent Water

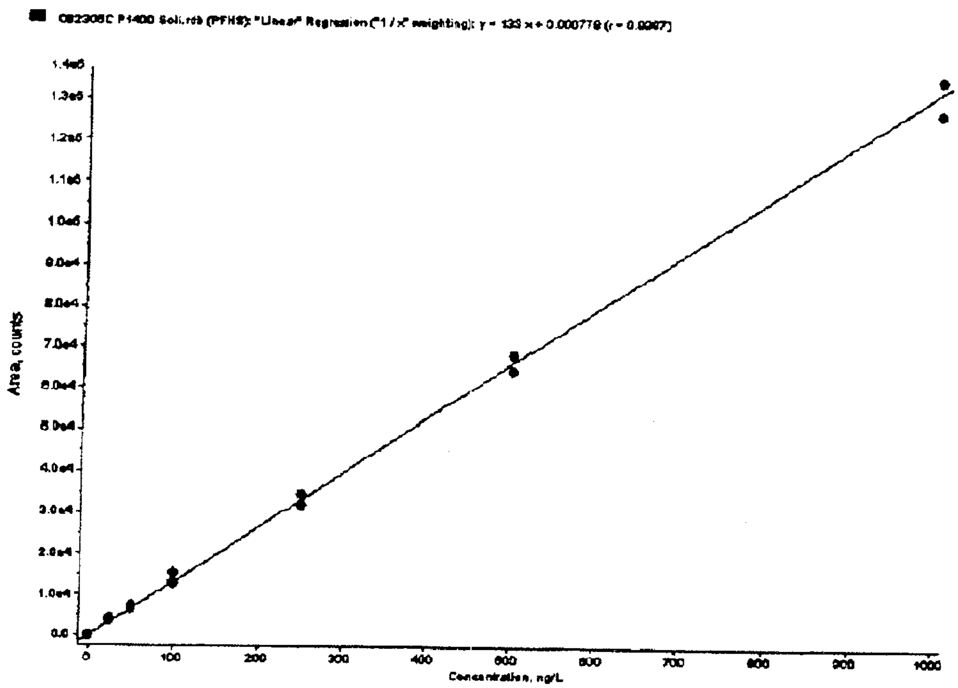


Figure 17. Extracted Standards of PFHS in Reagent Water, 25 ng/L and 50 ng/L, Respectively

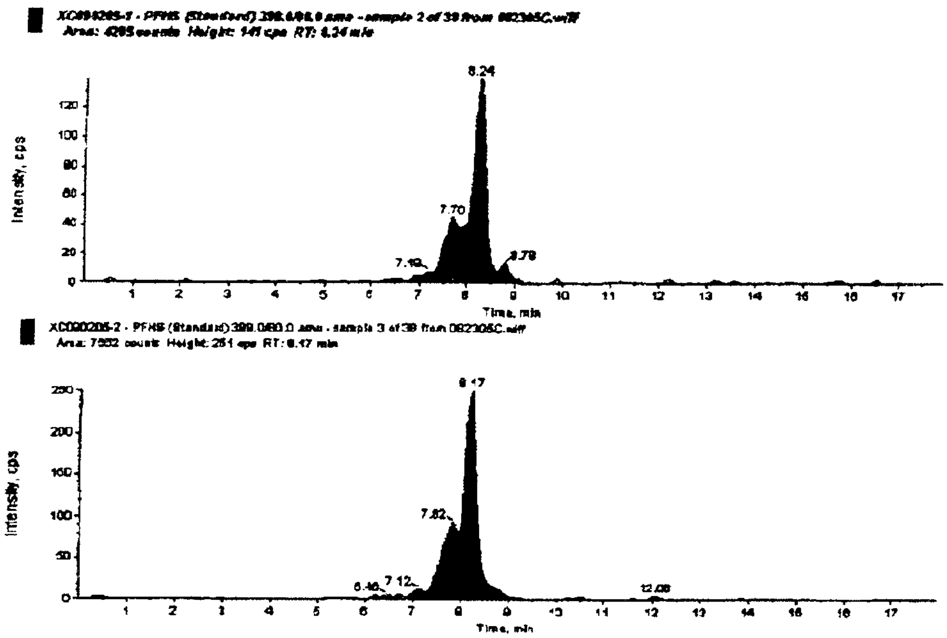
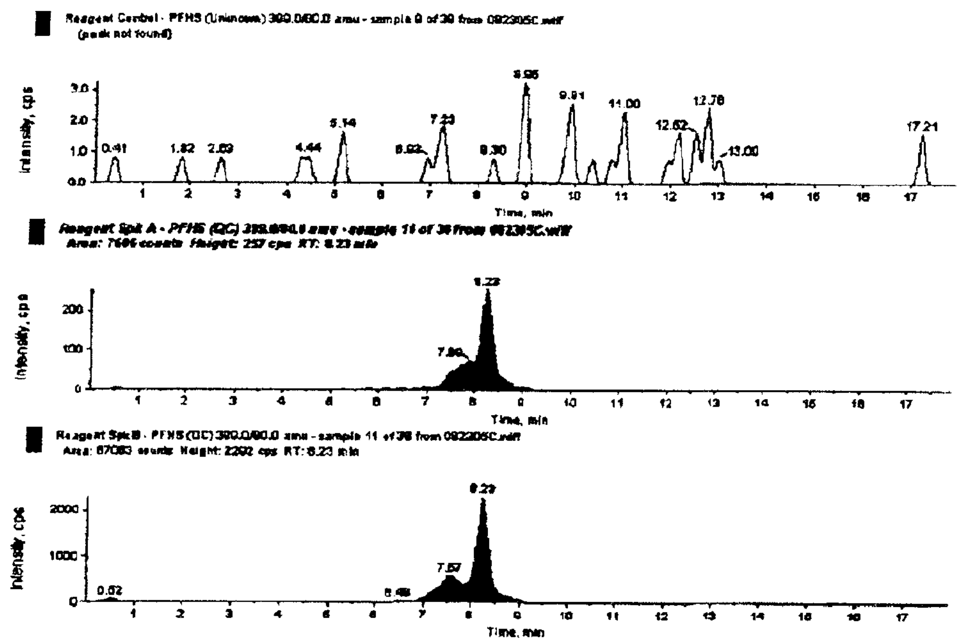


Figure 18. PFHS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



3MA01552150

2095.0373

Figure 19. Chromatogram Representing a Soil Sample Analyzed for PFHS (Exygen ID: C0081355, Data Set: 082305C)

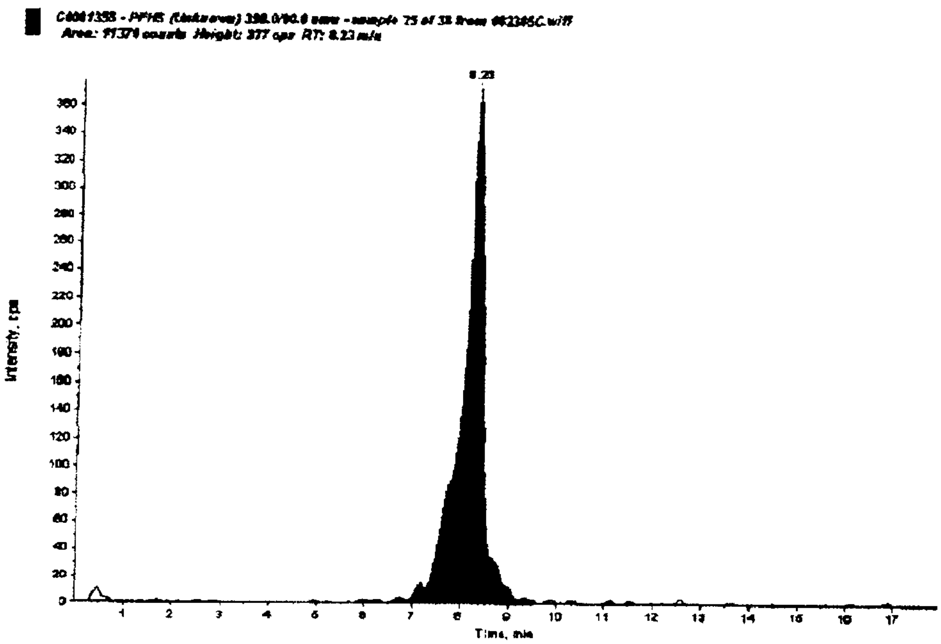


Figure 20. Chromatogram Representing a Ground Water Sample Analyzed for PFHS (Exygen ID: C0081228, Data Set: 091305A)

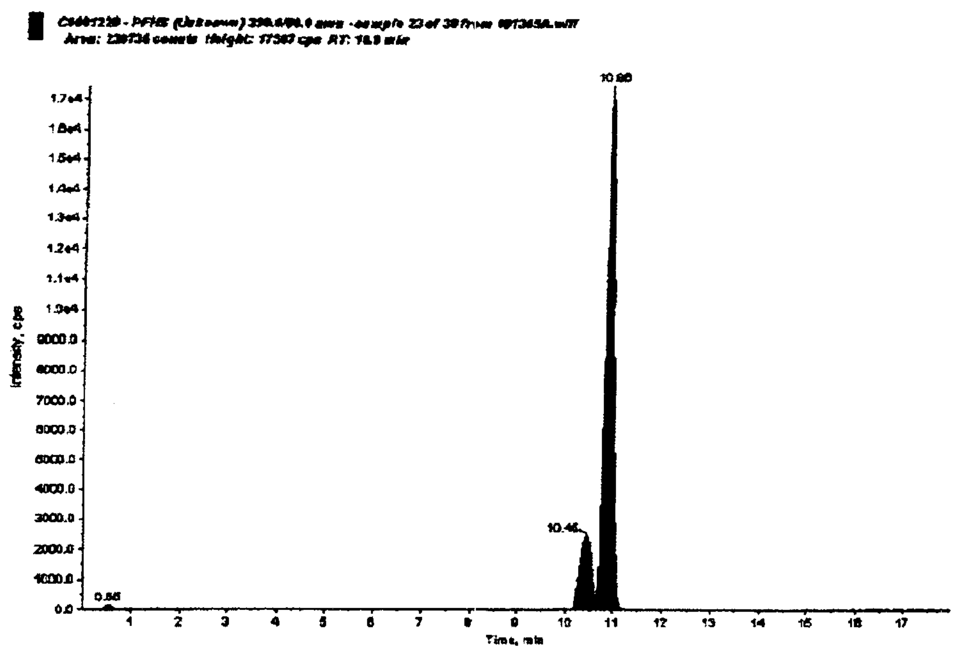


Figure 21. Typical Calibration Curve for PFOS in Reagent Water

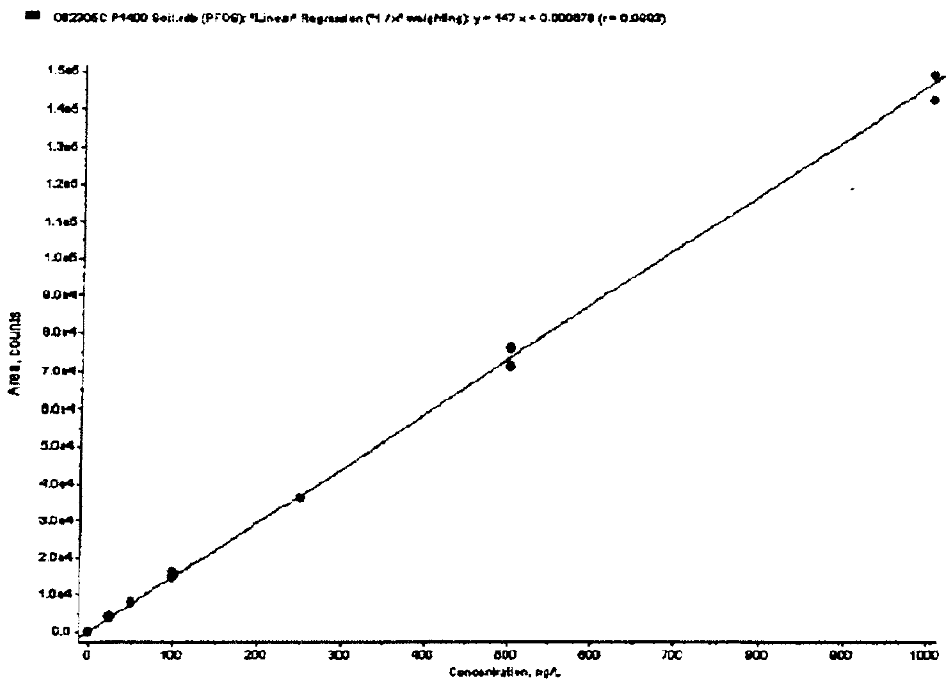
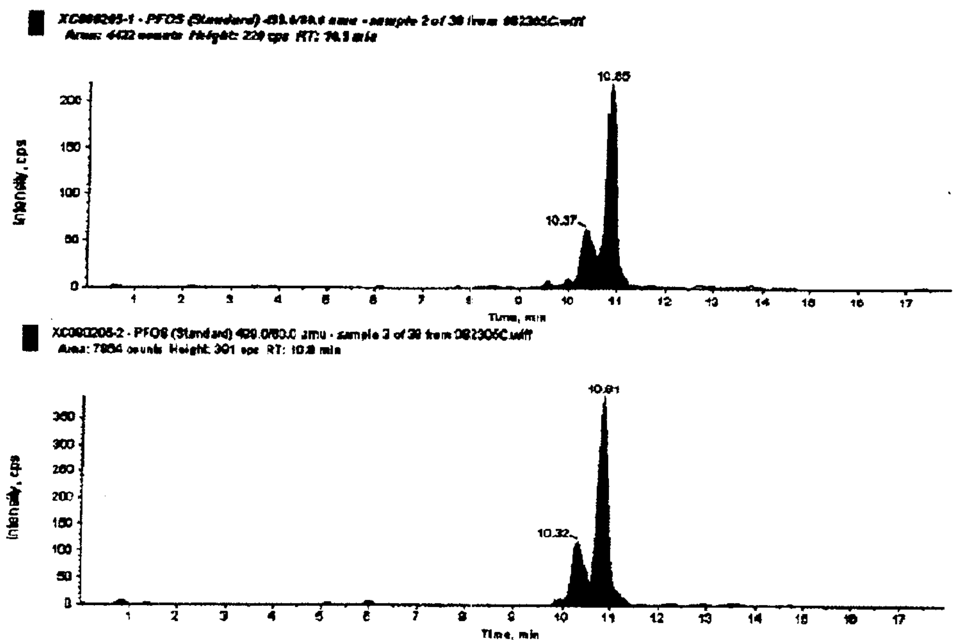


Figure 22. Extracted Standards of PFOS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



3MA01552154

2095.0377

Figure 23. PFOS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively

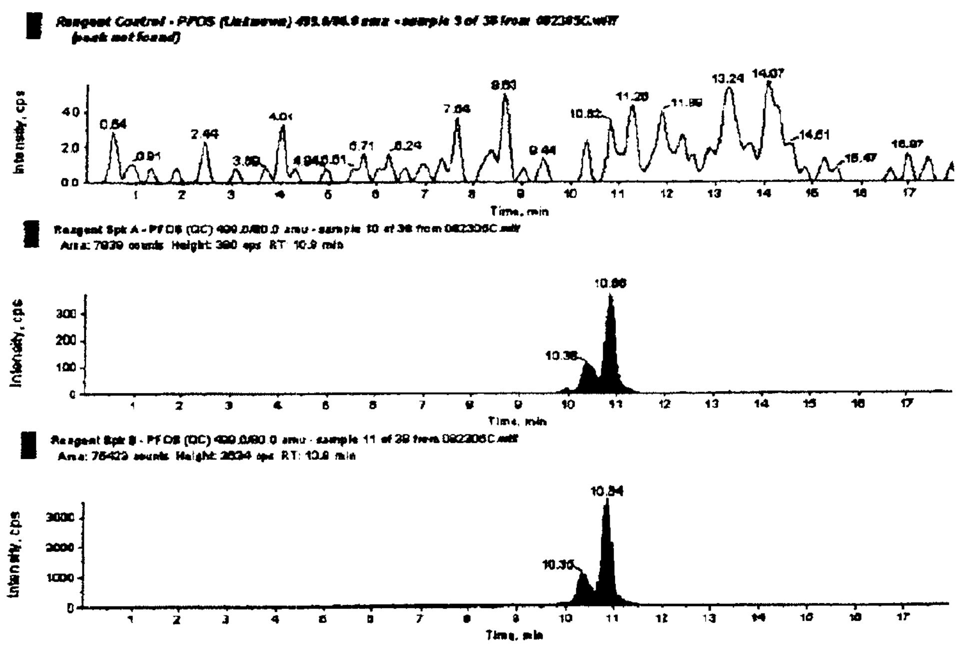


Figure 24. Chromatogram Representing a Soil Sample Analyzed for PFOS (Exygen ID: C0081355, Data Set: 082305C)

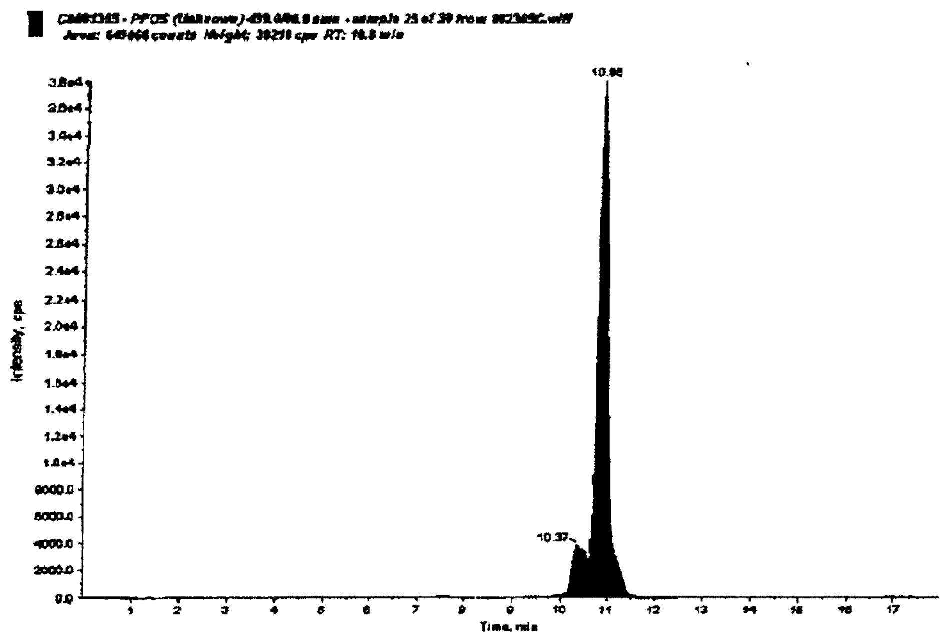
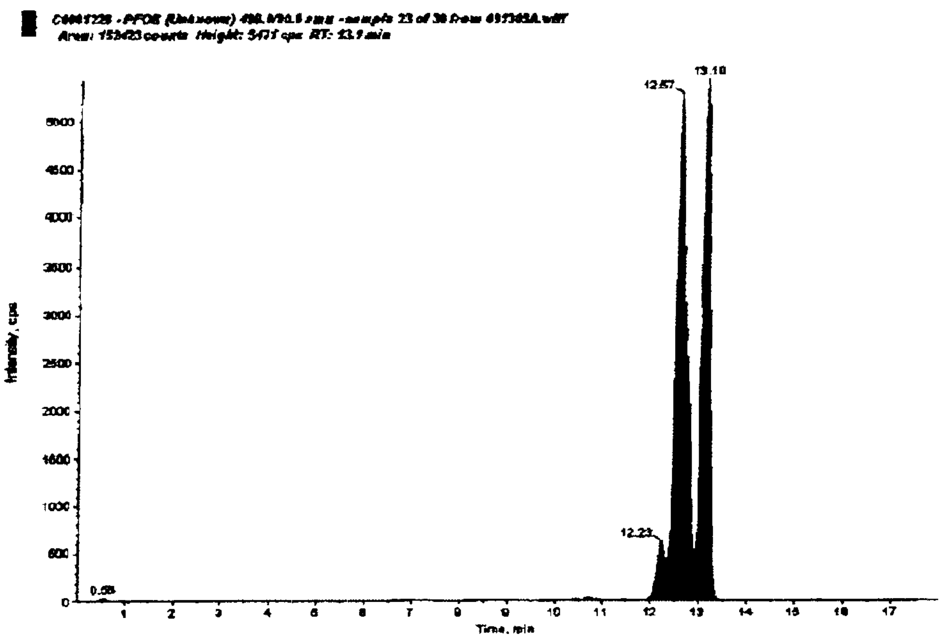


Figure 25. Chromatogram Representing a Ground Water Sample Analyzed for PFOS (Exygen ID: C0081228, Data Set: 091305A)



INTERIM REPORT #5 - Analysis of Cottage Grove Sediment and Surface Water Samples

STUDY TITLE

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

DATA REQUIREMENTS

EPA TSCA Good Laboratory Practice Standards 40 CFR 792

STUDY DIRECTOR

Jaisimha Kesari P.E., DEE
Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380
Phone: 610-701-3761

INTERIM REPORT COMPLETION DATE

November 30, 2005

PERFORMING LABORATORY

Exygen Research
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State College, PA 16801
Phone: 814-272-1039

STUDY SPONSOR

3M Company
3M Building 0236-01-B-10
St. Paul, MN 55144
Phone: 651-733-6374

PROJECT

Protocol Number: P0001400
Exygen Study Number: P0001400

Total Pages: 114

GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

Exygen Study Number P0001400, entitled "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program," conducted for 3M Company, is being performed in compliance with EPA TSCA Good Laboratory Practice Standards 40 CFR 792 by Exygen Research.

John Flaherty
Principal Investigator
Exygen Research

11/30/05
Date

Jaisimha Kesari P.E., DEE
Study Director
Weston Solutions, Inc.

12/2/05
Date

Robert A. Paschke
Sponsor Representative
3M Company

12/2/05
Date

QUALITY ASSURANCE STATEMENT

Exygen Research's Quality Assurance Unit reviewed Exygen Study Number P0001400, entitled, "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program". All reviewed phases[1] were inspected for conduct according to Exygen Research's Standard Operating Procedures, the Study Protocol, and all applicable Good Laboratory Practice Standards. All findings were reported to the Exygen Principal Investigator and Management and to the Study Director.

Phase	Date Inspected	Date Reported to Principal Investigator	Date Reported to Exygen Management	Date Reported to Study Director
6. Raw Data Review and Final Interim Analytical Report Review	11/09-11/05	11/29/05	11/30/05	11/30/05

Lydia J Shaffer

Lydia Shaffer
Technical Lead, Quality Assurance Unit

11/30/05
Date

[1]Note: All in-lab inspections will be documented in the QA statement for the final analytical report at the conclusion of the study. This QA statement involves only the review of the interim report and associated raw data.

CERTIFICATION OF AUTHENTICITY

This interim report, for Exygen Study Number P0001400, is a true and complete representation of the raw data.

Submitted by: Exygen Research
3058 Research Drive
State College, PA 16801
(814) 272-1039

Principal Investigator, Exygen:

John Flaherty
Vice President
Exygen Research

11/30/05
Date

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Richard A. Grazzini
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30-NOV-05
Date

Study Director, Weston Solutions, Inc.

Jaisimha Kesari P.E., DEE
Weston Solutions, Inc.

12/2/05
Date

Sponsor Representative, 3M Company:

Robert A. Paschke
Manager, 3M Corporate Environmental Programs

12/2/05
Date

STUDY IDENTIFICATION

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

PROTOCOL NUMBER:	P0001400
EXYGEN STUDY NUMBER:	P0001400
TYPE OF STUDY:	Residue
SAMPLE MATRIX:	Sediment and Surface Water
TEST SUBSTANCE:	Perfluorooctanoic acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS)
SPONSOR:	3M Company 3M Building 0236-01-B-10 St. Paul, MN 55144
STUDY DIRECTOR:	Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380
STUDY MONITOR:	Robert A. Paschke 3M Company 3M Building 42-02-E-27 St. Paul, MN 55144
PERFORMING LABORATORY:	Exygen Research 3058 Research Drive State College, PA 16801
ANALYTICAL PHASE TIMETABLE:	Study Initiation Date: 03/03/05 Interim Analytical Start Date: 09/28/05 Interim Analytical Termination Date: 10/27/05 Interim Report Completion Date: 11/30/05

PROJECT PERSONNEL

The Study Director for this project is Jaisimha Kesari at Weston Solutions, Inc. The following personnel from Exygen Research were associated with various phases of this interim portion of the study:

Name	Title
John Flaherty	Vice President
Karen Risha	Laboratory Supervisor
Chrissy Edwards	Technician
Mark Ammerman	Sample Custodian
Eric Edwards	Sample Custodian
Amy Sheehan	Associate Scientist
Mindy Cressley	Technician
Brittany Kravets	Technician

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1.0 SUMMARY

Exygen Research extracted and analyzed sediment and surface water samples for the determination of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) according to Exygen Methods V0001782 and V0001780, respectively (**Appendix A**).

The limit of quantitation for PFOA, PFBS, PFHS and PFOS in sediment was 0.4 ng/g (wet weight) and the limit of detection for PFOA, PFBS, PFHS and PFOS in sediment was 0.2 ng/g (wet weight). The limit of quantitation for PFOA, PFBS, PFHS and PFOS in surface water was 50 ng/L and the limit of detection for PFOA, PFBS, PFHS and PFOS in surface water was 25 ng/L.

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in sediment samples are summarized in **Table I**. Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in surface water samples and associated field QC samples are summarized in **Table II**.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the sediment samples are detailed in **Tables III and IV**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the sediment samples were 64 ± 24%, 49 ± 8%, 96 ± 10% and 84 ± 27%, respectively. Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the surface water samples and associated field QC samples are detailed in **Tables V and VI**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the surface water samples were 93 ± 18%, 102 ± 16%, 109 ± 13% and 98 ± 18%, respectively.

Fortification recoveries for ^{13}C PFOA in the sediment samples are detailed in **Table VII**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the sediment samples were 66 ± 13%. Fortification recoveries for ^{13}C PFOA in the surface water samples and associated field QC samples are detailed in **Table VIII**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the surface water samples were 88 ± 11%.

2.0 OBJECTIVE

The objective of the analytical part of this study was to determine levels of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) in sediment and surface water according to Protocol P0001400 (**Appendix A**).

3.0 INTRODUCTION

This report details the results of the analysis for the determination of PFOA, PFBS, PFHS and PFOS in sediment using the analytical method entitled, "V0001782: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Sediment by LC/MS/MS" and in surface water using the analytical method entitled, "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS."

The study was initiated on March 03, 2005, when the study director signed protocol number P0001400. The analytical start date for this interim report was September 28, 2005, and the analytical termination date for this interim report was October 27, 2005.

4.0 ANALYTICAL TEST SAMPLES

Twenty sediment samples and forty surface water samples (Exygen ID C0085575 – C0085634) were received at ambient temperature on August 15, 2005 from Charles Young at Weston Solutions, Inc. The twenty sediment samples represented twenty separate sample sites. The forty surface water samples represented nine sample sites and associated field QC samples. Three water samples represented a trip blank and two trip blank spikes. The samples were logged in by Exygen personnel and placed in refrigerated storage.

Sample log-in and chain of custody information is located in the raw data package associated with this interim report. Storage records will be kept at Exygen Research.

5.0 REFERENCE MATERIAL

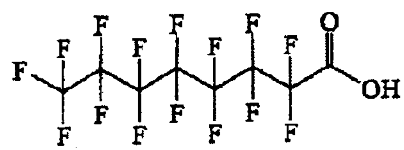
The analytical standard, PFOA, was purchased from Sigma Aldrich and was received at Exygen on December 08, 2003. The surrogate spiking standard, ^{13}C labeled perfluorooctanoic acid (^{13}C PFOA), was received at Exygen on April 15, 2004 from the 3M Company. 3M supplied the analytical standards PFBS and PFHS. PFBS was received from 3M at Exygen on May 13, 2005. PFHS was received from 3M at Exygen on January 20, 2003. PFOS was purchased from Fluka Corporation and was received at Exygen on April 23, 2003.

The available information for the reference materials is listed below. PFOA was stored ambient. PFBS, PFHS and ^{13}C PFOA were stored frozen and PFOS was stored refrigerated.

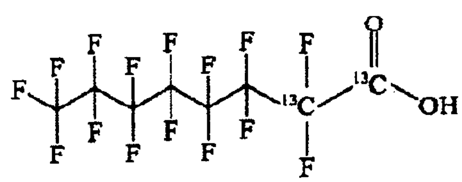
Compound	Exygen Inventory No.	Lot #	Purity (%)	Expiration Date
PFOA	SP0003800	23116HB	97.64	12/08/05
^{13}C PFOA	SP0004184	3507-195	97	03/29/09
PFBS	SP0005726	101	96.7	12/04/06
PFHS	SP0002401	SE036	98.6	10/18/06
PFOS	SP0002694	430180/1	101.2	10/31/07

The molecular structures of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS are given on the following pages:

PFOA
Chemical Name: Perfluorooctanoic acid
Molecular Weight: 414
Transitions Monitored: 413 → 369 (for quantification) and
413 → 219 (for confirmation)
Structure:

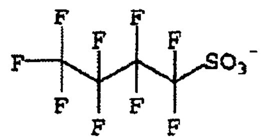


^{13}C PFOA
Chemical Name: 1,2-13C perfluorooctanoic acid
Molecular Weight: 416
Transition Monitored: 415 → 370
Structure:

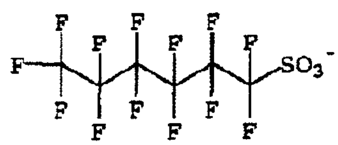


PFBS
Chemical Name: Perfluorobutanesulfonate
Molecular Weight: 338 supplied as the potassium salt ($C_4F_9SO_3^-K^+$)
Transitions Monitored: 299 → 99

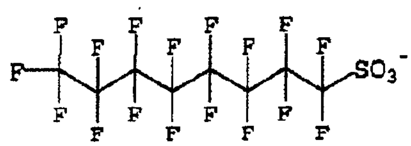
Structure:



PFHS
Chemical Name: Perfluorohexanesulfonate
Molecular Weight: 438 supplied as the potassium salt ($C_6F_{13}SO_3^-K^+$)
Transitions Monitored: 399 → 80
Structure:



PFOS
Chemical Name: Perfluorooctanesulfonate
Molecular Weight: 538 supplied as the potassium salt ($C_8F_{17}SO_3^-K^+$)
Transitions Monitored: 499 → 80
Structure:



6.0 DESCRIPTION OF ANALYTICAL METHOD

The analytical methods "V0001782: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Sediment by LC/MS/MS" and "V0001780: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Water by LC/MS/MS" were used for this study.

6.1 Extraction Procedure for Sediment

Before the samples were weighed for the extraction, they were mixed thoroughly by vigorously shaking the container. A 5-gram portion of sediment was weighed into a fifty-milliliter centrifuge tube for the extraction. After fortification of appropriate samples, 35 mL of 1% acetic acid in water was added to the samples. The samples were vortexed and allowed to shake on a wrist action shaker for ~60 minutes. The samples were centrifuged for ~20 minutes at ~3000 rpm. The supernatant was then loaded onto a C_{18} SPE cartridge conditioned with 10 mL of methanol and 20 mL of water. The eluate was discarded. Twenty milliliters of methanol was added to the sediment samples left in the centrifuge tube. The samples were vortexed and allowed to shake on a wrist action shaker for another 30 minutes. The samples were centrifuged again for ~20 minutes at ~3000 rpm. The supernatant was then loaded onto the same C_{18} SPE cartridge. The eluate was collected into a 500 mL Nalgene Bottle. The column was washed with 4 mL of methanol. The wash was collected in the same bottle as the eluate. Approximately two hundred milliliters of water was added to the bottles. The samples were mixed by shaking and loaded onto another C_{18} SPE cartridge conditioned with 10 mL of methanol and 20 mL of water. The eluate was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of eluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

6.2 Percent Solids Procedure For Sediment

Percent solids were determined using the procedure indicated in Exygen method V0000427. Approximately 20 grams of sample was weighed into a pan. The weight of the sample plus the pan was recorded. The samples was then dried in an oven overnight at 104 ± 2 °C. Then the samples were transferred to a dessicator and allowed to cool for ~15 minutes. Each sample was then weighed again, including the weight of the pan. The percent solid for each sample was then calculated.

6.3 Extraction Procedure for Water

A 40 mL aliquot of the water sample was used for the extraction procedure. After fortification of appropriate samples, the samples were loaded onto a C_{18} SPE cartridge conditioned with 10 mL of methanol and 5 mL of water. The eluate was discarded. Approximately five milliliters of methanol was added to the cartridge. Five milliliters of eluate was collected into a graduated 15 mL polypropylene centrifuge tube. Each sample was analyzed by LC/MS/MS electrospray.

6.4 Preparation of Standards and Fortification Solutions

A mixed stock standard solution of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS was prepared at a concentration of 1000 µg/mL by dissolving 100 mg of each of the standards (corrected for purity and salt content, if necessary) in methanol. From this solution, a 100 µg/mL fortification standard solution was prepared by taking 10 mL of the stock and bringing the volume up to 100 mL with methanol. By taking 10 mL of the 100 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 10 µg/mL fortification standard was prepared. By taking 10 mL of the 10 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 1.0 µg/mL fortification standard were prepared. By taking 10 mL of the 1.0 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.1 µg/mL fortification standard was prepared. By taking 10 mL of the 0.1 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.01 µg/mL fortification standard were prepared.

A set of standards containing PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS were prepared in water and processed through the extraction procedure, identical to samples. The following concentrations were prepared:

Conc. of Fort Solution (ng/mL)[1]	Fort Volume (µL)	Volume of Fortified Sample (mL)	Final Conc. of Calibration Std. (ng/L)
0	0	40	0
10	100	40	25
10	200	40	50
10	400	40	100
100	100	40	250
100	200	40	500
100	400	40	1000

[1] of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS

An additional stock solution of ^{13}C PFOA was prepared at 100 µg/mL and diluted to 1.0 and 0.1 µg/mL for bottle spiking purposes. Complete details can be found in the raw data package associated with this study.

The stock standard solution and all fortification and calibration standard solutions were stored in a refrigerator (4° ± 2°C) when not in use. Documentation of standard preparation is located in the raw data package associated with this interim report.

6.5 Chromatography

Quantification of PFOA, PFBS, PFHS and PFOS was accomplished by LC/MS/MS electrospray. The retention time of PFOA, PFBS, PFHS and PFOS was ~10.5 min, ~0.5 mins, ~9 mins, and ~11.5 mins, respectively. Peaks above the LOD were not detected in any of the reagent blank samples corresponding to the analyte retention time.

6.6 Instrument Sensitivity

The smallest standard amount injected during the chromatographic run had a concentration of 25 ng/L of PFOA, PFBS, PFHS and PFOS.

6.7 Description of LC/MS/MS Instrument and Operating Conditions

Instrument: API 4000 Biomolecular Mass Analyzer

Interface: Turbo Ion Spray Liquid Introduction Interface

Computer: DELL OptiPlex GX400

Software: Windows NT, Analyst 1.4.1

HPLC: Hewlett Packard (HP) Series 1100
HP Quat Pump
HP Vacuum Degasser
HP Autosampler
HP Column Oven

HPLC Column: Thermo Fluophase RP, 50 mm x 2.1 mm
Column Temp.: 30° C
Injection Vol.: 15 µL
Mobile Phase (A): 2 mM Ammonium Acetate in water
Mobile Phase (B): Methanol

Time (min)	% A	% B
0.0	65	35
1.0	65	35
8.0	25	75
10.0	25	75
11.0	65	35
18.0	65	35

Total run time: ~18 min
Flow Rate: 0.3 mL/min

Ions monitored:

Analyte	Mode	Transition Monitored	Approximate Retention Time (min)
PFOA	negative	413 → 369	~10.5 min.
PFOA Confirm Ion	negative	413 → 219	~10.5 min.
^{13}C PFOA	negative	415 → 370	~10.5 min.
PFBS	negative	299 → 99	~0.5 min.
PFHS	negative	399 → 80	~9 min.
PFOS	negative	499 → 80	~11.5 min.

6.8 Quantitation and Example Calculation

Fifteen microliters of sample or calibration standard were injected into the LC/MS/MS. The peak area was measured and the standard curve was generated (using 1/x fit weighted linear regression) by Analyst software using six concentrations of standards. The concentration was determined from the equations below.

Equation 1 calculated the amount of analyte found (in ng/mL, based on peak area) using the standard curve (linear regression parameters) generated by the Analyst software program.

Equation 1:

$$\text{Analyte found (ng/L)} = \frac{\text{(Peak area - intercept)}}{\text{slope}} \times \text{DF}$$

Where: DF = Dilution Factor, factor by which the final volume was diluted, if necessary.

For samples fortified with known amounts of analyte prior to extraction, Equation 2 was used to calculate the percent recovery.

Equation 2:

Recovery (%) =

$$\frac{\text{(analyte found (ng/L) - analyte in control (ng/L))}}{\text{amount added (ng/L)}} \times 100\%$$

Note: For the analyte recovery calculation, the "control" is the unspiked aliquot of the primary field sample.

Equation 3 was used to convert the amount of analyte found in ng/mL to ng/g (ppb).

Equation 3:

$$\text{Analyte found wet weight (ppb)} = \frac{[\text{analyte found (ng/L)} \times \text{volume extracted (L)}]}{\text{sample weight (g)}}$$

Equation 4 was then used to calculate the amount of analyte found in ppb based on dry weight.

Equation 4:

$$\text{Analyte found (ppb) dry weight} = \text{Analyte found (ppb)} \times [100\% / \text{total solids}(\%)]$$

An example of a calculation using an actual sample follows:

Sediment sample Exygen ID C0085617 Spk G (Set: 100505AR), fortified at 500 ng/L with PFOA where:

peak area	=	469822
intercept	=	2120
slope	=	3150
dilution factor	=	10
ng/L analyte added (fort level)	=	500
amt in corresponding sample (ng/L)*	=	1060
volume extracted (L)	=	0.04
sample weight (g)	=	5
total solids (%)	=	68.21

*The primary sample result was used for all calculations

From equation 1:

$$\text{Analyte found (ng/L)} = \frac{[469822 - 2120] \times 10}{3150}$$

$$= 1485 \text{ ng/L}$$

From equation 2:

$$\% \text{ Recovery} = \frac{(1485 \text{ ng/L} - 1060 \text{ ng/L}) \times 100\%}{500 \text{ ng/L}}$$

$$= 85\ \%$$

From equation 3:

$$\text{Analyte found wet weight (ppb)} = \frac{(1485 \text{ ng/L} \times 0.04 \text{ L})}{5 \text{ g}}$$

$$= 11.9 \text{ ppb}$$

From equation 4:

Analyte found (ppb) dry weight = 11.9 ppb x (100% /68.21%)

= 17.4 ppb

NOTE: This value may be slightly different than that of the raw data due to rounding.

7.0 EXPERIMENTAL DESIGN

^{13}C PFOA was used as a surrogate for all the samples. ^{13}C PFOA was added to the sediment samples and sample replicates in the laboratory after collection. ^{13}C PFOA was added to the surface water sample collection bottles in the laboratory before being shipped to the field for sampling. For surface water samples designated as field matrix spikes, PFOA, PFBS, PFHS and PFOS were also added at a known concentration to the bottles in the laboratory before being shipped to the field. The surface water sample bottles were filled to a 200 mL volumetric fill line in the field.

The sediment samples were extracted in six sets, one of which was a re-extraction. Each set included one reagent blank and two reagent blanks fortified at known concentrations. The first five sediment sets contained four samples each. The sixth sediment set contained a re-extraction of one sample. For each sample, a laboratory duplicate of the sample and two laboratory matrix spikes were also extracted. The laboratory spikes were fortified with known concentrations of PFBS, PFHS, PFOS, PFOA and ^{13}C PFOA.

The surface water samples were extracted in five sets, one of which was a re-extraction. Each set included one reagent blank and two reagent blanks fortified at known concentrations. The first surface water set contained four sample sites, along with a trip blank and trip blank spikes collected for the surface water samples. The second surface water set contained three sample sites. The third surface water set contained three sample sites. The fourth surface water set contained one sample site and a re-extraction for one sample site. The fifth surface water set was a re-extraction for one sample site. For each site, a sample, a field duplicate and two-matrix field spikes were collected. For each site, a laboratory duplicate of the primary sample was extracted and two laboratory matrix spikes were also extracted. For the two laboratory matrix spikes, two 40 mL portions of the primary sample collected for the site was poured from the bottle and fortified. Not only were PFBS, PFHS, PFOS and PFOA added in the laboratory prior to extraction, but also ^{13}C PFOA was added. In some cases, the additional ^{13}C PFOA was added because the levels of PFBS, PFHS, PFOS and PFOA spiked into the samples were known to exceed the calibration ranges and were not analyzed without dilution; therefore, ^{13}C PFOA levels were adjusted to require the same dilution as the other analytes.

8.0 RESULTS

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in sediment samples are summarized in **Table I**. Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in surface water samples and associated field QC samples are summarized in **Table II**.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the sediment samples are detailed in **Tables III and IV**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the sediment samples were 64 ± 24%, 49 ± 8%, 96 ± 10% and 84 ± 27%, respectively. Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the surface water samples and associated field QC samples are detailed in **Tables V and VI**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the surface water samples were 93 ± 18%, 102 ± 16%, 109 ± 13% and 98 ± 18%, respectively.

Fortification recoveries for ^{13}C PFOA in the sediment samples are detailed in **Table VII**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the sediment samples were 66 ± 13%. Fortification recoveries for ^{13}C PFOA in the surface water samples and associated field QC samples are detailed in **Table VIII**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the surface water samples were 88 ± 11%.

9.0 CONCLUSIONS

The sediment and surface water samples were successfully extracted and analyzed for PFOA, PFBS, PFHS and PFOS according to analytical methods V0001782 and V0001780, respectively. There were no circumstances that may have affected the data quality or integrity.

10.0 RETENTION OF DATA AND SAMPLES

All original paper data generated by Exygen Research that pertains to this interim report will be shipped to the study director. This does not include facility-specific raw data such as instrument or temperature logs. Exact copies of all raw data, as well as a signed copy of the interim analytical report and all original facility-specific raw data, will be retained in the Exygen Research archives for the period of time specified in EPA TSCA Good Laboratory Practice Standards 40 CFR 792.

TABLES

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Sediment Samples

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Dry Weight (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Weight (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Weight (ppb, ng/g)	Assessed Accuracy (+% / -%)	Analyte Found Dry Weight (ppb, ng/g)	Assessed Accuracy (+% / -%)
C0085615	CGMN-SD-MR005-0-050809	ND	60	ND	30	5.75	30	1.09	30**
C0085615 Rep	CGMN-SD-MR005-0-050809*	ND	60	ND	30	6.30	30	1.17	30**
C0085616	CGMN-SD-MR004-0-050809	ND	60	ND	30	NQ	30	NQ	30**
C0085616 Rep	CGMN-SD-MR004-0-050809*	ND	60	ND	30	NQ	30	NQ	30**
C0085617	CGMN-SD-MR003-0-050809	NQ	60	1.44	30	7.86	30	12.4	30**
C0085617 Rep	CGMN-SD-MR003-0-050809*	0.680	60	1.89	30	8.89	30	14.0	30**
C0085618	CGMN-SD-MR002-0-050809	ND	60	ND	30	NQ	30	ND	40**
C0085618 Rep	CGMN-SD-MR002-0-050809*	ND	60	ND	30	NQ	30	ND	40**
C0085619	CGMN-SD-MR001-0-050809	ND	60	ND	30	NQ	30	ND	40**
C0085619 Rep	CGMN-SD-MR001-0-050809*	ND	60	ND	30	NQ	30	ND	40**
C0085620	CGMN-SD-MR006-0-050809	ND	60	ND	30	1.30	40	ND	40**
C0085620 Rep	CGMN-SD-MR006-0-050809*	ND	60	ND	30	1.40	40	ND	40**
C0085621	CGMN-SD-EC011-0-050810	1.36	60	1.81	30	51.2	30	13.6	30**
C0085621 Rep	CGMN-SD-EC011-0-050810*	1.32	60	1.81	30	47.3	30	11.8	30**
C0085622	CGMN-SD-EC012-0-050810	1.12	60	1.23	30	31.1	30	13.0	30**
C0085622 Rep	CGMN-SD-EC012-0-050810*	1.07	60	1.33	30	32.7	30	14.0	30**
C0085623	CGMN-SD-EC021-0-050810	4.06	60	5.36	30	297	50***	27.2	30**
C0085623 Rep	CGMN-SD-EC021-0-050810*	4.17	60	6.28	30	236	50***	30.2	30**
C0085624	CGMN-SD-EC022-0-050810	6.48	60	2.46	30	58.9	30	16.4	50**
C0085624 Rep	CGMN-SD-EC022-0-050810*	6.74	60	2.43	30	67.9	30	18.6	50**
C0085625	CGMN-SD-EC031-0-050810	1.44	60	2.67	30	107	30	28.0	40**
C0085625 Rep	CGMN-SD-EC031-0-050810*	1.50	60	2.83	30	112	30	26.9	40**
C0085626	CGMN-SD-EC032-0-050810	2.37	60	1.18	30	24.1	30	11.9	50**
C0085626 Rep	CGMN-SD-EC032-0-050810*	2.16	60	1.20	30	24.2	30	11.5	50**
C0085627	CGMN-SD-WC011-0-050810	ND	50	6.30	30	66.0	30	13.5	50**
C0085627 Rep	CGMN-SD-WC011-0-050810*	ND	30	6.56	30	71.2	30	13.7	50**
C0085628	CGMN-SD-WC012-0-050810	ND	50	9.10	30	77.5	60**	21.4	30**
C0085628 Rep	CGMN-SD-WC012-0-050810*	ND	50	8.86	30	80.9	60**	17.4	30**
C0085629	CGMN-SD-WC021-0-050810	NQ	50	10.1	30	77.1	30	30.7	50**
C0085629 Rep	CGMN-SD-WC021-0-050810*	NQ	50	11.1	30	105	30	34.1	50**
C0085630	CGMN-SD-WC022-0-050810	NQ	50	7.51	30	34.2	30	37.5	50**
C0085630 Rep	CGMN-SD-WC022-0-050810*	ND	50	7.13	30	39.5	30	39.8	50**
C0085631	CGMN-SD-WC031-0-050810	ND	50	2.09	30	11.9	60**	3.85	40**
C0085631 Rep	CGMN-SD-WC031-0-050810*	ND	50	2.26	30	18.4	60**	4.36	40**
C0085632	CGMN-SD-WC032-0-050810	ND	50	2.08	30	20.0	40	4.52	40**
C0085632 Rep	CGMN-SD-WC032-0-050810*	ND	50	2.09	30	16.9	40	4.40	40**
C0085633	CGMN-SD-WU011-0-050812	ND	40	1.36	30	13.2	30	1.51	60**
C0085633 Rep	CGMN-SD-WU011-0-050812*	ND	40	1.60	30	18.3	30	1.59	60**
C0085634	CGMN-SD-EU011-0-050812	ND	40	0.656	30	10.1	30	18.7	40**
C0085634 Rep	CGMN-SD-EU011-0-050812*	ND	40	0.677	30	10.1	30	19.0	40**

*Laboratory Duplicate

**The accuracy results for this sample are based on spike recoveries coupled with surrogate recovery data.

***The accuracy results for this sample are based on surrogate recovery data.

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

3MA01552181

Table II. Summary of PFBS, PFHS, PFOS and PFOA in Surface Water Samples

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Dry Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Dry Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)
C0085575	CGMN-SW-MR005-0-050809	103	30	NQ	30	109	30	134	30
C0085575 Rep	CGMN-SW-MR005-0-050809*	86.9	30	NQ	30	95.1	30	129	30
C0085576	CGMN-SW-MR005-0-050809 Dup	99.1	30	NQ	30	99.2	30	134	30
C0085579	CGMN-SW-MR004-0-050809	NQ	30	ND	30	ND	30	ND	30
C0085579 Rep	CGMN-SW-MR004-0-050809*	NQ	30	ND	30	ND	30	ND	30
C0085580	CGMN-SW-MR004-0-050809 Dup	NQ	30	ND	30	ND	30	ND	30
C0085583	CGMN-SW-MR003-0-050809	NQ	30	ND	30	ND	30	ND	30
C0085583 Rep	CGMN-SW-MR003-0-050809*	NQ	30	ND	30	ND	30	ND	30
C0085584	CGMN-SW-MR003-0-050809 Dup	NQ	30	ND	30	ND	30	ND	30
C0085587	CGMN-SW-MR002-0-050809	50.0	30	NQ	30	ND	30	NQ	30
C0085587 Rep	CGMN-SW-MR002-0-050809*	50.4	30	77.8	30	ND	30	NQ	30
C0085588	CGMN-SW-MR002-0-050809 Dup	NQ	30	NQ	30	ND	30	NQ	30
C0085591	CGMN-SW-MR001-0-050809	NQ	30	ND	30	ND	30	ND	30
C0085591 Rep	CGMN-SW-MR001-0-050809*	NQ	30	ND	30	ND	30	ND	30
C0085592	CGMN-SW-MR001-0-050809 Dup	NQ	30	ND	30	ND	30	ND	30
C0085595	CGMN-SW-MR006-0-050809	NQ	30	ND	30	NQ	30	NQ	30
C0085595 Rep	CGMN-SW-MR006-0-050809*	NQ	30	ND	30	NQ	30	NQ	30
C0085596	CGMN-SW-MR006-0-050809 Dup	NQ	30	ND	30	NQ	30	NQ	30
C0085599	CGMN-SW-EC011-0-050810	12200	40**	4720	40**	22600	40**	16300	40**
C0085599 Rep	CGMN-SW-EC011-0-050810*	13300	40**	4660	40**	23500	40**	15800	40**
C0085600	CGMN-SW-EC011-0-050810 Dup	13700	40**	4750	40**	29900	40**	17100	40**
C0085603	CGMN-SW-WC011-0-050810	90.1	30	364	30	1310	30	707	30
C0085603 Rep	CGMN-SW-WC011-0-050810*	73.2	30	336	30	1170	30	673	30
C0085604	CGMN-SW-WC011-0-050810 Dup	82.5	30	370	30	1330	30	702	30
C0085607	CGMN-SW-EU011-0-050812	ND	30	ND	30	ND	30	66.5	30
C0085607 Rep	CGMN-SW-EU011-0-050812*	ND	30	NQ	30	NQ	30	66.9	30
C0085608	CGMN-SW-EU011-0-050812 Dup	ND	30	ND	30	ND	30	68.5	30
C0085611	CGMN-SW-MR006-2-050809	ND	30	ND	30	ND	30	ND	30
C0085611 Rep	CGMN-SW-MR006-2-050809*	ND	30	ND	30	ND	30	ND	30
C0085612	Trip Blank	ND	30	ND	30	ND	30	ND	30

*Laboratory Duplicate
**The accuracy results for this sample are based on surrogate recovery data
ND = Not detected at or above 25 ng/L.
NQ = Not quantifiable = Measured concentration between 25 ng/L and the Limit of Quantitation (LOQ) which is 50 ng/L.

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Table III. Matrix Spike Recovery of PFBS and PFHS in Sediment Samples

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found in Sample (ng/g, wet wt.)	C4 Sulfonate PFBS Amount Recovered (ng/g, wet wt.)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	C6 Sulfonate PFHS Amt Found in Sample (ng/g, wet wt.)	C6 Sulfonate PFHS Amount Recovered (ng/g, wet wt.)	C6 Sulfonate PFHS Recovery (%)
CGMN-SD-MR005-0-060609 ([illegible] Spk C, 4 ng/L Lab Spike)	4	ND	1.78	45	4	ND	4.09	102
CGMN-SD-MR005-0-060609 ([illegible] Spk D, 40 ng/L Lab Spike)	40	ND	18.0	45	40	ND	39.4	99
CGMN-SD-MR004-0-060609 ([illegible] Spk E, 4 ng/L Lab Spike)	4	ND	1.82	46	4	ND	3.94	98
CGMN-SD-MR004-0-060609 ([illegible] Spk F, 40 ng/L Lab Spike)	40	ND	18.5	46	40	ND	37.1	93
CGMN-SD-MR003-0-060609 ([illegible] Spk G, 4 ng/L Lab Spike)	4	NQ	2.02	51	4	0.984	5.18	104
CGMN-SD-MR003-0-060609 ([illegible] Spk H, 40 ng/L Lab Spike)	40	NQ	16.4	41	40	0.984	37.9	92
CGMN-SD-MR002-0-060609 ([illegible] Spk I, 4 ng/L Lab Spike)	4	ND	1.69	42	4	ND	3.70	93
CGMN-SD-MR002-0-060609 ([illegible] Spk J, 40 ng/L Lab Spike)	40	ND	15.4	39	40	ND	37.1	93
CGMN-SD-MR001-0-060609 ([illegible] Spk C, 4 ng/L Lab Spike)	4	ND	1.74	44	4	ND	3.90	98
CGMN-SD-MR001-0-060609 ([illegible] Spk D, 40 ng/L Lab Spike)	40	ND	16.6	42	40	ND	37.8	95
CGMN-SD-MR006-0-060609 ([illegible] Spk E, 4 ng/L Lab Spike)	4	ND	1.92	48	4	ND	4.02	101
CGMN-SD-MR006-0-060609 ([illegible] Spk F, 40 ng/L Lab Spike)	40	ND	17.7	44	40	ND	35.2	88
CGMN-SD-EC011-0-060610 ([illegible] Spk G, 4 ng/L Lab Spike)	4	1.07	2.97	48	4	1.25	5.56	108
CGMN-SD-EC011-0-060610 ([illegible] Spk H, 40 ng/L Lab Spike)	40	1.07	18.3	43	40	1.25	39.6	96
CGMN-SD-EC012-0-060610 ([illegible] Spk I, 4 ng/L Lab Spike)	4	0.904	2.58	42	4	0.992	5.39	110
CGMN-SD-EC012-0-060610 ([illegible] Spk J, 40 ng/L Lab Spike)	40	0.904	17.0	40	40	0.992	39.3	98
CGMN-SD-EC021-0-060610 ([illegible] Spk C, 4 ng/L Lab Spike)	4	2.87	4.66	45	4	3.79	7.59	95
CGMN-SD-EC021-0-060610 ([illegible] Spk D, 40 ng/L Lab Spike)	40	2.87	19.6	42	40	3.79	41.0	93
CGMN-SD-EC022-0-060610 ([illegible] Spk E, 4 ng/L Lab Spike)	4	5.00	6.48	37	4	1.90	6.15	106
CGMN-SD-EC022-0-060610 ([illegible] Spk F, 40 ng/L Lab Spike)	40	5.00	26.1	50	40	1.90	38.6	92

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFBS and PFHS in Sediment Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g, wet wt.)	Amount Recovered (ng/g, wet wt.)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g, wet wt.)	Amount Recovered (ng/g, wet wt.)	Recovery (%)
CGMN-SD-EC031-0-050610 ([illegible] Spk G, 4 ng/L Lab Spike)	4	1.10	2.82	43	4	2.20	6.38	80
CGMN-SD-EC031-0-050610 ([illegible] Spk H, 40 ng/L Lab Spike)	40	1.10	20.8	49	40	2.20	55.1	132
CGMN-SD-EC032-0-050610 ([illegible] Spk I, 4 ng/L Lab Spike)	4	1.91	3.40	37	4	0.952	4.80	96
CGMN-SD-EC032-0-050610 ([illegible] Spk J, 40 ng/L Lab Spike)	40	1.91	20.9	47	40	0.952	38.8	94
CGMN-SD-WC011-0-050610 ([illegible] Spk C, 4 ng/L Lab Spike)	4	ND	2.94	61	4	2.38	6.16	95
CGMN-SD-WC011-0-050610 ([illegible] Spk D, 40 ng/L Lab Spike)	40	ND	21.0	53	40	2.38	41.1	97
CGMN-SD-WC012-0-050610 ([illegible] Spk E, 4 ng/L Lab Spike)	4	ND	2.19	55	4	3.67	7.30	90
CGMN-SD-WC012-0-050610 ([illegible] Spk F, 40 ng/L Lab Spike)	40	ND	21.4	54	40	3.67	38.8	87
CGMN-SD-WC021-0-050610 ([illegible] Spk G, 4 ng/L Lab Spike)	4	NQ	2.30	58	4	5.22	8.72	88
CGMN-SD-WC021-0-050610 ([illegible] Spk H, 40 ng/L Lab Spike)	40	NQ	19.5	49	40	5.22	41.1	90
CGMN-SD-WC022-0-050610 ([illegible] Spk I, 4 ng/L Lab Spike)	4	NQ	2.27	57	4	4.22	8.00	95
CGMN-SD-WC022-0-050610 ([illegible] Spk J, 40 ng/L Lab Spike)	40	NQ	22.1	55	40	4.22	39.8	89
CGMN-SD-WC031-0-050610 ([illegible] Spk C, 4 ng/L Lab Spike)	4	ND	2.22	56	4	1.34	5.29	99
CGMN-SD-WC031-0-050610 ([illegible] Spk D, 40 ng/L Lab Spike)	40	ND	22.4	56	40	1.34	35.6	86
CGMN-SD-WC032-0-050610 ([illegible] Spk E, 4 ng/L Lab Spike)	4	ND	2.17	54	4	1.12	4.97	96
CGMN-SD-WC032-0-050610 ([illegible] Spk F, 40 ng/L Lab Spike)	40	ND	22.4	56	40	1.12	37.8	92
CGMN-SD-WU011-0-050612 ([illegible] Spk G, 4 ng/L Lab Spike)	4	ND	2.41	60	4	1.07	4.10	76
CGMN-SD-WU011-0-050612 ([illegible] Spk H, 40 ng/L Lab Spike)	40	ND	25.8	65	40	1.07	35.4	86
CGMN-SD-EU011-0-050612 ([illegible] Spk I, 4 ng/L Lab Spike)	4	ND	2.64	66	4	0.554	5.02	112
CGMN-SD-EU011-0-050612 ([illegible] Spk J, 40 ng/L Lab Spike)	40	ND	27.3	68	40	0.554	39.0	96
			Average:	[illegible]			Average:	[illegible]
			Standard Deviation:	8			Standard Deviation:	16

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
ND = Not detected at or above 0.2 ng/g (wet weight).
NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFOS and PFOA in Sediment Samples

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	C8 Sulfonate PFOS Amt Found in Sample (ng/g, wet wt.)	C8 Sulfonate PFOS Amount Recovered (ng/g, wet wt.)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found in Sample (ng/g, wet wt.)	C8 Acid PFOA Amount Recovered (ng/g, wet wt.)	C8 Acid PFOA Recovery (%)
CGMN-SD-MR005-0-050809 (C[illegible] Spk C, 4 ng/L Lab Spike)	4	2.90	6.82	98	4	0.550	3.70	79
CGMN-SD-MR005-0-050809 (C[illegible] Spk D, 40 ng/L Lab Spike)	40	2.90	39.8	92	40	0.550	27.8	68
CGMN-SD-MR004-0-050809 (C[illegible] Spk E, 4 ng/L Lab Spike)	4	NQ	3.55	89	4	NQ	3.03	76
CGMN-SD-MR004-0-050809 (C[illegible] Spk F, 40 ng/L Lab Spike)	40	NQ	34.1	85	40	NQ	24.8	62
CGMN-SD-MR003-0-050809 (C[illegible] Spk G, 4 ng/L Lab Spike)	4	5.22	9.84	116	4	8.48	11.8	83
CGMN-SD-MR003-0-050809 (C[illegible] Spk H, 40 ng/L Lab Spike)	40	5.22	38.4	83	40	8.48	33.1	62
CGMN-SD-MR002-0-050809 (C[illegible] Spk I, 4 ng/L Lab Spike)	4	NQ	3.30	83	4	ND	2.67	67
CGMN-SD-MR002-0-050809 (C[illegible] Spk J, 40 ng/L Lab Spike)	40	NQ	31.2	78	40	ND	23.4	59
CGMN-SD-MR001-0-050809 (C[illegible] Spk C, 4 ng/L Lab Spike)	4	NQ	3.61	90	4	ND	2.76	69
CGMN-SD-MR001-0-050809 (C[illegible] Spk D, 40 ng/L Lab Spike)	40	NQ	28.0	70	40	ND	21.8	55
CGMN-SD-MR006-0-050809 (C[illegible] Spk E, 4 ng/L Lab Spike)	4	0.748	3.33	65	4	ND	2.72	68
CGMN-SD-MR006-0-050809 (C[illegible] Spk F, 40 ng/L Lab Spike)	40	0.748	29.4	72	40	ND	20.1	50
CGMN-SD-EC011-0-050810 (C[illegible] Spk G, 4 ng/L Lab Spike)	4	39.8	60.8	*	4	10.5	15.1	115
CGMN-SD-EC011-0-050810 (C[illegible] Spk H, 40 ng/L Lab Spike)	40	39.8	69.9	75	40	10.5	30.7	51
CGMN-SD-EC012-0-050810 (C[illegible] Spk I, 4 ng/L Lab Spike)	4	25.0	38.9	*	4	10.5	15.5	125
CGMN-SD-EC012-0-050810 (C[illegible] Spk J, 40 ng/L Lab Spike)	40	25.0	67.4	106	40	10.5	33.8	58
CGMN-SD-EC021-0-050810 (C[illegible] Spk C, 4 ng/L Lab Spike)	4	210	146	*	4	19.3	18.0	*
CGMN-SD-EC021-0-050810 (C[illegible] Spk D, 40 ng/L Lab Spike)	40	210	191	*	40	19.3	47.7	71
CGMN-SD-EC022-0-050810 (C[illegible] Spk E, 4 ng/L Lab Spike)	4	45.4	56.3	*	4	12.6	13.8	*
CGMN-SD-EC022-0-050810 (C[illegible] Spk F, 40 ng/L Lab Spike)	40	45.4	78.6	83	40	12.6	35.8	58

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Matrix Spike Recovery of PFOS and PFOA in Sediment Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g, wet wt.)	Amount Recovered (ng/g, wet wt.)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g, wet wt.)	Amount Recovered (ng/g, wet wt.)	Recovery (%)
CGMN-SD-EC031-0-050810 ([illegible] Spk G, 4 ng/L Lab Spike)	4	81.6	76.3	*	4	19.9	13.8	*
CGMN-SD-EC031-0-050810 ([illegible] Spk H, 40 ng/L Lab Spike)	40	81.6	114	81	40	19.9	75.7	140
CGMN-SD-EC032-0-050810 ([illegible] Spk I, 4 ng/L Lab Spike)	4	19.4	23.6	*	4	9.80	9.92	8
CGMN-SD-EC032-0-050810 ([illegible] Spk J, 40 ng/L Lab Spike)	40	19.4	53.6	86	40	9.80	30.1	51
CGMN-SD-WC011-0-050810 ([illegible] Spk C, 4 ng/L Lab Spike)	4	24.7	30.1	*	4	5.07	7.10	51
CGMN-SD-WC011-0-050810 ([illegible] Spk D, 40 ng/L Lab Spike)	40	24.7	56.8	80	40	5.07	28.0	57
CGMN-SD-WC012-0-050810 ([illegible] Spk E, 4 ng/L Lab Spike)	4	33.0	38.9	*	4	9.12	12.1	76
CGMN-SD-WC012-0-050810 ([illegible] Spk F, 40 ng/L Lab Spike)	40	33.0	47.4	36	40	9.12	25.6	42
CGMN-SD-WC021-0-050810 ([illegible] Spk G, 4 ng/L Lab Spike)	4	39.9	42.2	*	4	15.9	17.8	*
CGMN-SD-WC021-0-050810 ([illegible] Spk H, 40 ng/L Lab Spike)	40	39.9	78.6	97	40	15.9	37.0	53
CGMN-SD-WC022-0-050810 ([illegible] Spk I, 4 ng/L Lab Spike)	4	19.2	27.6	*	4	21.0	23.8	*
CGMN-SD-WC022-0-050810 ([illegible] Spk J, 40 ng/L Lab Spike)	40	19.2	44.4	63	40	21.0	40.8	50
CGMN-SD-WC031-0-050810 ([illegible] Spk C, 4 ng/L Lab Spike)	4	7.66	15.1	188	4	2.48	5.14	67
CGMN-SD-WC031-0-050810 ([illegible] Spk D, 40 ng/L Lab Spike)	40	7.56	25.4	45	40	2.46	19.0	41
CGMN-SD-WC032-0-050810 ([illegible] Spk E, 4 ng/L Lab Spike)	4	10.9	13.4	63	4	2.48	4.84	60
CGMN-SD-WC032-0-050810 ([illegible] Spk F, 40 ng/L Lab Spike)	40	10.9	31.6	52	40	2.48	20.6	45
CGMN-SD-WU011-0-050812 ([illegible] Spk G, 4 ng/L Lab Spike)	4	12.0	15.6	95	4	1.19	2.86	42
CGMN-SD-WU011-0-050812 ([illegible] Spk H, 40 ng/L Lab Spike)	40	12.0	41.8	75	40	1.19	18.1	42
CGMN-SD-EU011-0-050812 ([illegible] Spk I, 4 ng/L Lab Spike)	4	6.58	11.0	111	4	12.2	10.7	*
CGMN-SD-EU011-0-050812 ([illegible] Spk J, 40 ng/L Lab Spike)	40	6.58	40.4	85	40	12.2	39.8	69
			Average:	84			Average:	54
			Standard Deviation:	27			Standard Deviation:	34

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

ND = Not detected at or above 0.2 ng/g (wet weight).

NQ = Not quantifiable = Measured concentration between 0.2 ng/g (wet weight) and the Limit of Quantitation (LOQ) which is 0.4 ng/g (wet weight).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFBS and PFHS in Surface Water Samples

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	C4 Sulfonate PFBS Amt Found in Sample (ng/L)	C4 Sulfonate PFBS Amount Recovered (ng/L)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	C6 Sulfonate PFHS Amt Found in Sample (ng/L)	C6 Sulfonate PFHS Amount Recovered (ng/L)	C6 Sulfonate PFHS Recovery (%)
CGMN-SW-MR005-0-050809 ([illegible] Spk C, 100 ng/L Lab Spike)	100	103	193	90	100	NQ	150	150
CGMN-SW-MR005-0-050809 ([illegible] Spk D, 1000 ng/L Lab Spike)	1000	103	1180	108	1000	NQ	1080	108
CGMN-SW-MR005-0-050809 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	103	230	127	100	NQ	127	127
CGMN-SW-MR005-0-050809 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	103	893	79	1000	NQ	880	88
CGMN-SW-MR004-0-050809 ([illegible] Spk E, 100 ng/L Lab Spike)	100	NQ	121	121	100	ND	118	118
CGMN-SW-MR004-0-050809 ([illegible] Spk F, 1000 ng/L Lab Spike)	1000	NQ	969	97	1000	ND	1080	108
CGMN-SW-MR004-0-050809 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	NQ	92.9	93	100	ND	106	105
CGMN-SW-MR004-0-050809 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	NQ	948	95	1000	ND	981	98
CGMN-SW-MR003-0-050809 ([illegible] Spk G, 100 ng/L Lab Spike)	100	NQ	114	114	100	ND	114	114
CGMN-SW-MR003-0-050809 ([illegible] Spk H, 1000 ng/L Lab Spike)	1000	NQ	930	93	1000	ND	1080	108
CGMN-SW-MR003-0-050809 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	NQ	86.3	86	100	ND	90.8	91
CGMN-SW-MR003-0-050809 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	NQ	868	87	1000	ND	915	92
CGMN-SW-MR002-0-050809 ([illegible] Spk C, 100 ng/L Lab Spike)	1000	50.0	931	88	1000	NQ	1080	108
CGMN-SW-MR002-0-050809 ([illegible] Spk D, 1000 ng/L Lab Spike)	10000	50.0	9690	96	10000	NQ	9750	98
CGMN-SW-MR002-0-050809 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	50.0	118	68	100	NQ	113	113
CGMN-SW-MR002-0-050809 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	50.0	830	78	1000	NQ	907	91
CGMN-SW-MR001-0-050809 ([illegible] Spk E, 100 ng/L Lab Spike)	100	NQ	129	129	100	ND	112	112
CGMN-SW-MR001-0-050809 ([illegible] Spk F, 1000 ng/L Lab Spike)	1000	NQ	1240	124	1000	ND	1110	111
CGMN-SW-MR001-0-050809 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	NQ	88.9	89	100	ND	90.1	90
CGMN-SW-MR001-0-050809 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	NQ	946	95	1000	ND	1000	100
CGMN-SW-MR006-0-050809 ([illegible] Spk G, 100 ng/L Lab Spike)	100	NQ	133	133	100	ND	124	124
CGMN-SW-MR006-0-050809 ([illegible] Spk H, 1000 ng/L Lab Spike)	1000	NQ	1200	120	1000	ND	1170	117
CGMN-SW-MR006-0-050809 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	NQ	122	122	100	ND	127	127
CGMN-SW-MR006-0-050809 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	NQ	975	98	1000	ND	957	96

*Sample residue exceeds the spiking level significantly (>3x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table V. Matrix Spike Recovery of PFBS and PFHS in Surface Water Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-SW-EC011-0-050810 ([illegible] Spk C, 100 ng/L Lab Spike)	100	12200	13300	*	100	4720	4590	*
CGMN-SW-EC011-0-050810 ([illegible] Spk D, 1000 ng/L Lab Spike)	1000	12200	15200	*	1000	4720	5770	*
CGMN-SW-EC011-0-050810 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	12200	13300	*	100	4720	4870	*
CGMN-SW-EC011-0-050810 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	12200	13300	*	1000	4720	5400	*
CGMN-SW-WC011-0-050810 ([illegible] Spk E, 100 ng/L Lab Spike)	100	90.1	172	82	100	364	467	*
CGMN-SW-WC011-0-050810 ([illegible] Spk F, 1000 ng/L Lab Spike)	1000	90.1	1130	104	1000	364	1470	111
CGMN-SW-WC011-0-050810 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	90.1	172	82	100	364	457	*
CGMN-SW-WC011-0-050810 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	90.1	1090	100	1000	364	1530	117
CGMN-SW-EU011-0-050812 ([illegible] Spk G, 100 ng/L Lab Spike)	100	ND	147	117	100	ND	113	113
CGMN-SW-EU011-0-050812 ([illegible] Spk H, 1000 ng/L Lab Spike)	1000	ND	1020	102	1000	ND	1050	105
CGMN-SW-EU011-0-050812 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	ND	111	111	100	ND	119	119
CGMN-SW-EU011-0-050812 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	ND	1060	106	1000	ND	1160	116
CGMN-SW-MR006-2-050809 ([illegible] Spk I, 100 ng/L Lab Spike)	100	ND	118	118	100	ND	101	101
CGMN-SW-MR006-2-050809 ([illegible] Spk J, 1000 ng/L Lab Spike)	1000	ND	1070	107	1000	ND	1130	113
Trip Blank Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	ND	94.3	94	100	ND	107	107
Trip Blank High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	ND	1130	113	1000	ND	1190	119
			Average:	102			Average:	109
			Standard Deviation:	16			Standard Deviation:	13

*Sample residue exceeds the spiking level significantly (>1x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VI. Matrix Spike Recovery of PFOS and PFOA in Surface Water Samples

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/L)	C8 Sulfonate PFOS Amt Found in Sample (ng/L)	C8 Sulfonate PFOS Amount Recovered (ng/L)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/L)	C8 Acid PFOA Amt Found in Sample (ng/L)	C8 Acid PFOA Amount Recovered (ng/L)	C8 Acid PFOA Recovery (%)
CGMN-SW-MR005-0-050809 (C[illegible] Spk C, 100 ng/L Lab Spike)	100	109	216	107	100	134	235	101
CGMN-SW-MR005-0-050809 (C[illegible] Spk D, 1000 ng/L Lab Spike)	1000	109	1030	92	1000	134	899	76
CGMN-SW-MR005-0-050809 Low Spike 0.1 ppb (C[illegible], 100 ng/L Field Spike)	100	109	179	70	100	134	257	123
CGMN-SW-MR005-0-050809 High Spike 1.0 ppb (C[illegible], 1000 ng/L Field Spike)	1000	109	763	65	1000	134	863	73
CGMN-SW-MR004-0-050809 (C[illegible] Spk E, 100 ng/L Lab Spike)	100	ND	104	104	100	ND	92.3	92
CGMN-SW-MR004-0-050809 (C[illegible] Spk F, 1000 ng/L Lab Spike)	1000	ND	906	91	1000	ND	747	75
CGMN-SW-MR004-0-050809 Low Spike 0.1 ppb (C[illegible], 100 ng/L Field Spike)	100	ND	84.6	85	100	ND	73.0	73
CGMN-SW-MR004-0-050809 High Spike 1.0 ppb (C[illegible], 1000 ng/L Field Spike)	1000	ND	654	55	1000	ND	788	79
CGMN-SW-MR003-0-050809 (C[illegible] Spk G, 100 ng/L Lab Spike)	100	ND	103	103	100	ND	89.5	90
CGMN-SW-MR003-0-050809 (C[illegible] Spk H, 1000 ng/L Lab Spike)	1000	ND	952	95	1000	ND	731	73
CGMN-SW-MR003-0-050809 Low Spike 0.1 ppb (C[illegible], 100 ng/L Field Spike)	100	ND	80.5	81	100	ND	88.1	88
CGMN-SW-MR003-0-050809 High Spike 1.0 ppb (C[illegible], 1000 ng/L Field Spike)	1000	ND	780	78	1000	ND	866	87
CGMN-SW-MR002-0-050809 (C[illegible] Spk C, 100 ng/L Lab Spike)	1000	ND	997	100	1000	NQ	718	72
CGMN-SW-MR002-0-050809 (C[illegible] Spk D, 1000 ng/L Lab Spike)	10000	ND	9320	93	10000	NQ	7930	79
CGMN-SW-MR002-0-050809 Low Spike 0.1 ppb (C[illegible], 100 ng/L Field Spike)	100	ND	100	100	100	NQ	88.7	89
CGMN-SW-MR002-0-050809 High Spike 1.0 ppb (C[illegible], 1000 ng/L Field Spike)	1000	ND	688	69	1000	NQ	814	81
CGMN-SW-MR001-0-050809 (C[illegible] Spk E, 100 ng/L Lab Spike)	100	ND	106	106	100	ND	93.0	93
CGMN-SW-MR001-0-050809 (C[illegible] Spk F, 1000 ng/L Lab Spike)	1000	ND	918	92	1000	ND	808	81
CGMN-SW-MR001-0-050809 Low Spike 0.1 ppb (C[illegible], 100 ng/L Field Spike)	100	ND	82.0	82	100	ND	87.8	88
CGMN-SW-MR001-0-050809 High Spike 1.0 ppb (C[illegible], 1000 ng/L Field Spike)	1000	ND	805	81	1000	ND	883	88
CGMN-SW-MR006-0-050809 (C[illegible] Spk G, 100 ng/L Lab Spike)	100	NQ	117	117	100	NQ	124	124
CGMN-SW-MR006-0-050809 (C[illegible] Spk H, 1000 ng/L Lab Spike)	1000	NQ	968	96	1000	NQ	836	84
CGMN-SW-MR006-0-050809 Low Spike 0.1 ppb (C[illegible], 100 ng/L Field Spike)	100	NQ	133	133	100	NQ	144	144
CGMN-SW-MR006-0-050809 High Spike 1.0 ppb (C[illegible], 1000 ng/L Field Spike)	1000	NQ	868	87	1000	NQ	974	97

*Sample residue exceeds the spiking level significantly (>3x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VI. Matrix Spike Recovery of PFOS and PFOA in Surface Water Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/L)	Amt Found in Sample (ng/L)	Amount Recovered (ng/L)	Recovery (%)
CGMN-SW-EC011-0-050810 ([illegible] Spk C, 100 ng/L Lab Spike)	100	22500	27600	*	100	15300	16100	*
CGMN-SW-EC011-0-050810 ([illegible] Spk D, 1000 ng/L Lab Spike)	1000	22500	24800	*	1000	15300	16800	*
CGMN-SW-EC011-0-050810 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	22500	25900	*	100	15300	16300	*
CGMN-SW-EC011-0-050810 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	22800	27300	*	1000	15300	14600	*
CGMN-SW-WC011-0-050810 ([illegible] Spk E, 100 ng/L Lab Spike)	100	1310	1470	*	100	707	867	*
CGMN-SW-WC011-0-050810 ([illegible] Spk F, 1000 ng/L Lab Spike)	1000	1310	2470	116	1000	707	1630	92
CGMN-SW-WC011-0-050810 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	1310	1380	*	100	707	787	*
CGMN-SW-WC011-0-050810 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	1310	2600	129	1000	707	1960	125
CGMN-SW-EU011-0-050812 ([illegible] Spk G, 100 ng/L Lab Spike)	100	ND	117	117	100	66.5	166	[illegible]
CGMN-SW-EU011-0-050812 ([illegible] Spk H, 1000 ng/L Lab Spike)	1000	ND	1040	104	1000	66.5	882	82
CGMN-SW-EU011-0-050812 Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	ND	138	138	100	66.5	182	116
CGMN-SW-EU011-0-050812 High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	ND	1200	120	1000	66.5	1240	117
CGMN-SW-MR008-2-050809 ([illegible] Spk I, 100 ng/L Lab Spike)	100	ND	96.6	96	100	ND	103	103
CGMN-SW-MR008-2-050809 ([illegible] Spk J, 1000 ng/L Lab Spike)	1000	ND	942	94	1000	ND	824	82
Trip Blank Low Spike 0.1 ppb ([illegible], 100 ng/L Field Spike)	100	ND	101	101	100	ND	110	110
Trip Blank High Spike 1.0 ppb ([illegible], 1000 ng/L Field Spike)	1000	ND	1190	119	1000	ND	1180	118
			Average:	98			Average:	93
			Standard Deviation:	18			Standard Deviation:	15

*Sample residue exceeds the spiking level significantly (>3x spiking level); therefore, an accurate recovery value cannot be calculated.
ND = Not detected at or above 25 ng/L (ppt).
NQ = Not quantifiable = Measured concentration between 25 ng/L (ppt) and the Limit of Quantitation (LOQ) which is 50 ng/L (ppt).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VII. Surrogate Spike Recovery of ^{13}C PFOA in Sediment Samples

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0085615	CGMN-SD-MR005-0-050809	4	3.48	87
C0085615 Rep	CGMN-SD-MR005-0-050809	4	3.42	86
C0085615 Spk C	CGMN-SD-MR005-0-050809	4	3.10	78
C0085615 Spk D	CGMN-SD-MR005-0-050809	40	26.6	67
C0085616	CGMN-SD-MR004-0-050809	4	3.12	78
C0085616 Rep	CGMN-SD-MR004-0-050809	4	3.36	84
C0085616 Spk E	CGMN-SD-MR004-0-050809	4	2.77	69
C0085616 Spk F	CGMN-SD-MR004-0-050809	40	23.7	59
C0085617	CGMN-SD-MR003-0-050809	4	3.38	85
C0085617 Rep	CGMN-SD-MR003-0-050809	4	3.59	90
C0085617 Spk G	CGMN-SD-MR003-0-050809	4	2.95	74
C0085617 Spk H	CGMN-SD-MR003-0-050809	40	23.4	59
C0085618	CGMN-SD-MR002-0-050809	4	3.40	85
C0085618 Rep	CGMN-SD-MR002-0-050809	4	3.50	88
C0085618 Spk I	CGMN-SD-MR002-0-050809	4	2.67	67
C0085618 Spk J	CGMN-SD-MR002-0-050809	40	22.4	56
C0085619	CGMN-SD-MR001-0-050809	4	3.14	79
C0085619 Rep	CGMN-SD-MR001-0-050809	4	2.98	75
C0085619 Spk C	CGMN-SD-MR001-0-050809	4	2.52	63
C0085619 Spk D	CGMN-SD-MR001-0-050809	40	21.4	54
C0085620	CGMN-SD-MR006-0-050809	4	3.08	77
C0085620 Rep	CGMN-SD-MR006-0-050809	4	3.20	80
C0085620 Spk E	CGMN-SD-MR006-0-050809	4	2.68	67
C0085620 Spk F	CGMN-SD-MR006-0-050809	40	19.3	48
C0085621	CGMN-SD-EC011-0-050810	4	3.01	75
C0085621 Rep	CGMN-SD-EC011-0-050810	4	3.14	79
C0085621 Spk G	CGMN-SD-EC011-0-050810	4	2.54	64
C0085621 Spk H	CGMN-SD-EC011-0-050810	40	21.3	53
C0085622	CGMN-SD-EC012-0-050810	4	3.17	79
C0085622 Rep	CGMN-SD-EC012-0-050810	4	2.95	74
C0085622 Spk I	CGMN-SD-EC012-0-050810	4	2.37	59
C0085622 Spk J	CGMN-SD-EC012-0-050810	40	19.7	49
C0085623	CGMN-SD-EC021-0-050810	4	3.40	86
C0085623 Rep	CGMN-SD-EC021-0-050810	4	3.40	85
C0085623 Spk C	CGMN-SD-EC021-0-050810	4	2.70	68
C0085623 Spk D	CGMN-SD-EC021-0-050810	40	23.0	58
C0085624	CGMN-SD-EC022-0-050810	4	3.29	82
C0085624 Rep	CGMN-SD-EC022-0-050810	4	3.14	79
C0085624 Spk E	CGMN-SD-EC022-0-050810	4	2.58	65
C0085624 Spk F	CGMN-SD-EC022-0-050810	40	21.4	54

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VII. Surrogate Spike Recovery of ^{13}C PFOA in Sediment Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0085625	CGMN-SD-EC031-0-050810	4	3.10	78
C0085625 Rep	CGMN-SD-EC031-0-050810	4	3.04	76
C0085625 Spk G	CGMN-SD-EC031-0-050810	4	2.56	64
C0085625 Spk H	CGMN-SD-EC031-0-050810	40	22.0	55
C0085626	CGMN-SD-EC032-0-050810	4	3.08	77
C0085626 Rep	CGMN-SD-EC032-0-050810	4	3.18	80
C0085626 Spk I	CGMN-SD-EC032-0-050810	4	2.46	62
C0085626 Spk J	CGMN-SD-EC032-0-050810	40	22.2	56
C0085627	CGMN-SD-WC011-0-050810	4	2.50	63
C0085627 Rep	CGMN-SD-WC011-0-050810	4	2.49	62
C0085627 Spk C	CGMN-SD-WC011-0-050810	4	2.08	52
C0085627 Spk D	CGMN-SD-WC011-0-050810	40	21.4	54
C0085628	CGMN-SD-WC012-0-050810	4	2.61	65
C0085628 Rep	CGMN-SD-WC012-0-050810	4	2.51	63
C0085628 Spk E	CGMN-SD-WC012-0-050810	4	2.28	57
C0085628 Spk F	CGMN-SD-WC012-0-050810	40	19.2	48
C0085629	CGMN-SD-WC021-0-050810	4	2.73	68
C0085629 Rep	CGMN-SD-WC021-0-050810	4	2.68	67
C0085629 Spk G	CGMN-SD-WC021-0-050810	4	2.08	52
C0085629 Spk H	CGMN-SD-WC021-0-050810	40	19.5	49
C0085630	CGMN-SD-WC022-0-050810	4	2.42	61
C0085630 Rep	CGMN-SD-WC022-0-050810	4	2.43	61
C0085630 Spk I	CGMN-SD-WC022-0-050810	4	2.27	57
C0085630 Spk J	CGMN-SD-WC022-0-050810	40	18.7	47
C0085631	CGMN-SD-WC031-0-050810	4	2.21	55
C0085631 Rep	CGMN-SD-WC031-0-050810	4	2.42	61
C0085631 Spk C	CGMN-SD-WC031-0-050810	4	2.14	54
C0085631 Spk D	CGMN-SD-WC031-0-050810	40	16.2	41
C0085632	CGMN-SD-WC032-0-050810	4	2.43	61
C0085632 Rep	CGMN-SD-WC032-0-050810	4	2.48	62
C0085632 Spk E	CGMN-SD-WC032-0-050810	4	2.10	53
C0085632 Spk F	CGMN-SD-WC032-0-050810	40	17.8	45
C0085633	CGMN-SD-WU011-0-050812	4	2.67	67
C0085633 Rep	CGMN-SD-WU011-0-050812	4	2.68	67
C0085633 Spk G	CGMN-SD-WU011-0-050812	4	1.79	45
C0085633 Spk H	CGMN-SD-WU011-0-050812	40	17.5	44
C0085634	CGMN-SD-EU011-0-050812	4	3.18	80
C0085634 Rep	CGMN-SD-EU011-0-050812	4	3.33	83
C0085634 Spk I	CGMN-SD-EU011-0-050812	4	2.71	68
C0085634 Spk J	CGMN-SD-EU011-0-050812	40	25.2	63
			Average:	66
			Standard Deviation:	13

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Surface Water Samples

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/L)	^{13}C-PFOA Amount Recovered (ng/L)	^{13}C-PFOA Recovery (%)
C0085575	CGMN-SW-MR005-0-050809	500	420	84
C0085575 Rep	CGMN-SW-MR005-0-050809	500	409	82
C0085575 Spk C	CGMN-SW-MR005-0-050809	600	568	95
C0085575 Spk D	CGMN-SW-MR005-0-050809	1500	1190	79
C0085576	CGMN-SW-MR005-0-050809 Dup	500	483	97
C0085577	CGMN-SW-MR005-0-050809 Low Spike 0.1 ppb	100	92.5	93
C0085578	CGMN-SW-MR005-0-050809 High Spike 1.0 ppb	1000	703	70
C0085579	CGMN-SW-MR004-0-050809	500	414	83
C0085579 Rep	CGMN-SW-MR004-0-050809	500	464	93
C0085579 Spk E	CGMN-SW-MR004-0-050809	600	479	80
C0085579 Spk F	CGMN-SW-MR004-0-050809	1500	1170	78
C0085580	CGMN-SW-MR004-0-050809 Dup	500	441	88
C0085581	CGMN-SW-MR004-0-050809 Low Spike 0.1 ppb	100	111	111
C0085582	CGMN-SW-MR004-0-050809 High Spike 1.0 ppb	1000	1120	112
C0085583	CGMN-SW-MR003-0-050809	500	464	93
C0085583 Rep	CGMN-SW-MR003-0-050809	500	424	85
C0085583 Spk G	CGMN-SW-MR003-0-050809	600	583	97
C0085583 Spk H	CGMN-SW-MR003-0-050809	1500	1220	81
C0085584	CGMN-SW-MR003-0-050809 Dup	500	454	91
C0085585	CGMN-SW-MR003-0-050809 Low Spike 0.1 ppb	100	83.5	84
C0085586	CGMN-SW-MR003-0-050809 High Spike 1.0 ppb	1000	818	82
C0085587	CGMN-SW-MR002-0-050809	500	400	80
C0085587 Rep	CGMN-SW-MR002-0-050809	500	433	87
C0085587 Spk C	CGMN-SW-MR002-0-050809	1500	1090	73
C0085587 Spk D	CGMN-SW-MR002-0-050809	10500	8190	78
C0085588	CGMN-SW-MR002-0-050809 Dup	500	428	86
C0085589	CGMN-SW-MR002-0-050809 Low Spike 0.1 ppb	100	114	114
C0085590	CGMN-SW-MR002-0-050809 High Spike 1.0 ppb	1000	898	90
C0085591	CGMN-SW-MR001-0-050809	500	418	84
C0085591 Rep	CGMN-SW-MR001-0-050809	500	432	86
C0085591 Spk E	CGMN-SW-MR001-0-050809	600	579	97
C0085591 Spk F	CGMN-SW-MR001-0-050809	1500	1160	77
C0085592	CGMN-SW-MR001-0-050809 Dup	500	484	97
C0085593	CGMN-SW-MR001-0-050809 Low Spike 0.1 ppb	100	84.1	84
C0085594	CGMN-SW-MR001-0-050809 High Spike 1.0 ppb	1000	849	85
C0085595	CGMN-SW-MR006-0-050809	500	449	90
C0085595 Rep	CGMN-SW-MR006-0-050809	500	445	89
C0085595 Spk G	CGMN-SW-MR006-0-050809	600	601	100
C0085595 Spk H	CGMN-SW-MR006-0-050809	1500	1210	81
C0085596	CGMN-SW-MR006-0-050809 Dup	500	484	97
C0085597	CGMN-SW-MR006-0-050809 Low Spike 0.1 ppb	100	106	106
C0085598	CGMN-SW-MR006-0-050809 High Spike 1.0 ppb	1000	856	86

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VIII. Surrogate Spike Recovery of ^{13}C PFOA in Surface Water Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/L)	Amount Recovered (ng/L)	Recovery (%)
C0085599	CGMN-SW-EC011-0-050810	500	347	69
C0085599 Rep	CGMN-SW-EC011-0-050810	500	343	69
C0085599 Spk C	CGMN-SW-EC011-0-050810	600	404	67
C0085599 Spk D	CGMN-SW-EC011-0-050810	1500	1170	78
C0085600	CGMN-SW-EC011-0-050810 Dup	500	352	70
C0085601	CGMN-SW-EC011-0-050810 Low Spike 0.1 ppb	100	80.9	81
C0085602	CGMN-SW-EC011-0-050810 High Spike 1.0 ppb	1000	827	83
C0085603	CGMN-SW-WC011-0-050810	500	439	88
C0085603 Rep	CGMN-SW-WC011-0-050810	500	397	79
C0085603 Spk E	CGMN-SW-WC011-0-050810	600	551	92
C0085603 Spk F	CGMN-SW-WC011-0-050810	1500	1230	82
C0085604	CGMN-SW-WC011-0-050810 Dup	500	415	83
C0085605	CGMN-SW-WC011-0-050810 Low Spike 0.1 ppb	100	82.2	82
C0085606	CGMN-SW-WC011-0-050810 High Spike 1.0 ppb	1000	1030	103
C0085607	CGMN-SW-EU011-0-050812	500	453	91
C0085607 Rep	CGMN-SW-EU011-0-050812	500	471	94
C0085607 Spk G	CGMN-SW-EU011-0-050812	600	592	99
C0085607 Spk H	CGMN-SW-EU011-0-050812	1500	1310	87
C0085608	CGMN-SW-EU011-0-050812 Dup	500	430	86
C0085609	CGMN-SW-EU011-0-050812 Low Spike 0.1 ppb	100	108	108
C0085610	CGMN-SW-EU011-0-050812 High Spike 1.0 ppb	1000	1080	108
C0085611	CGMN-SW-MR006-2-050809	600	403	67
C0085611 Rep	CGMN-SW-MR006-2-050809	500	401	80
C0085611 Spk I	CGMN-SW-MR006-2-050809	500	463	93
C0085611 Spk J	CGMN-SW-MR006-2-050809	1500	1250	83
C0085612	Trip Blank	500	517	103
C0085613	Trip Blank Low Spike 0.1 ppb	100	108	108
C0085614	Trip Blank High Spike 1.0 ppb	1000	1160	116
			Average:	88
			Standard Deviation:	11

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IX. Total Percent Solids for Sediment Samples

Exygen ID	Client Sample ID	Total Solids (%)
C0085615	CGMN-SD-MR005-0-050809	50.49
C0085616	CGMN-SD-MR004-0-050809	70.65
C0085617	CGMN-SD-MR003-0-050809	68.21
C0085618	CGMN-SD-MR002-0-050809	69.69
C0085619	CGMN-SD-MR001-0-050809	58.90
C0085620	CGMN-SD-MR006-0-050809	57.56
C0085621	CGMN-SD-EC011-0-050810	77.75
C0085622	CGMN-SD-EC012-0-050810	80.50
C0085623	CGMN-SD-EC021-0-050810	70.82
C0085624	CGMN-SD-EC022-0-050810	77.14
C0085625	CGMN-SD-EC031-0-050810	76.56
C0085626	CGMN-SD-EC032-0-050810	80.66
C0085627	CGMN-SD-WC011-0-050810	37.44
C0085628	CGMN-SD-WC012-0-050810	42.53
C0085629	CGMN-SD-WC021-0-050810	51.79
C0085630	CGMN-SD-WC022-0-050810	56.14
C0085631	CGMN-SD-WC031-0-050810	63.84
C0085632	CGMN-SD-WC032-0-050810	54.37
C0085633	CGMN-SD-WU011-0-050812	78.79
C0085634	CGMN-SD-EU011-0-050812	64.88

FIGURES

Figure 1. Typical Calibration Curve for PFOA in Reagent Water

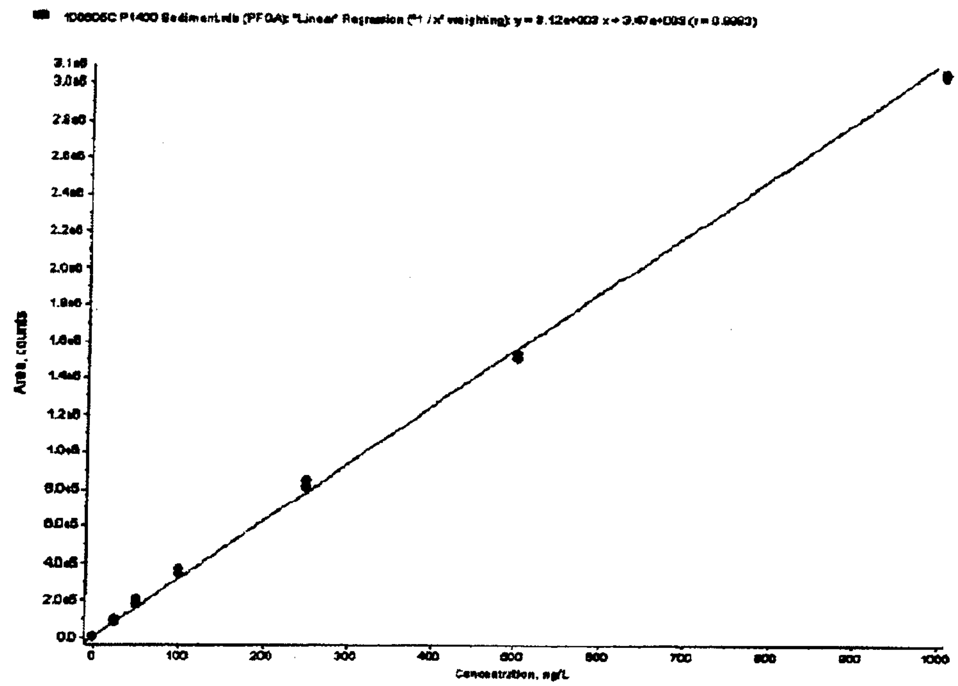


Figure 2. Extracted Standards of PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively

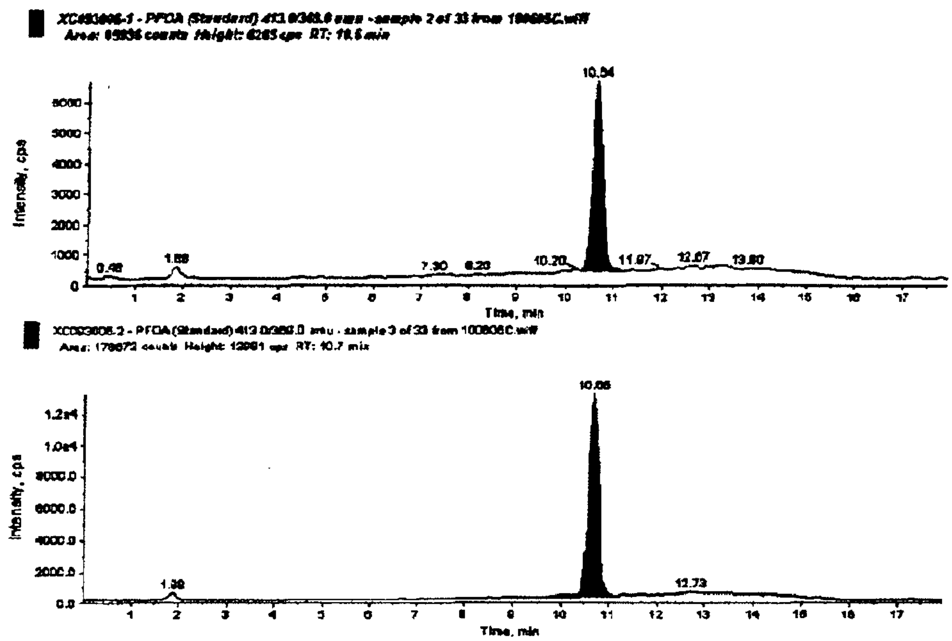


Figure 3. PFOA in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively

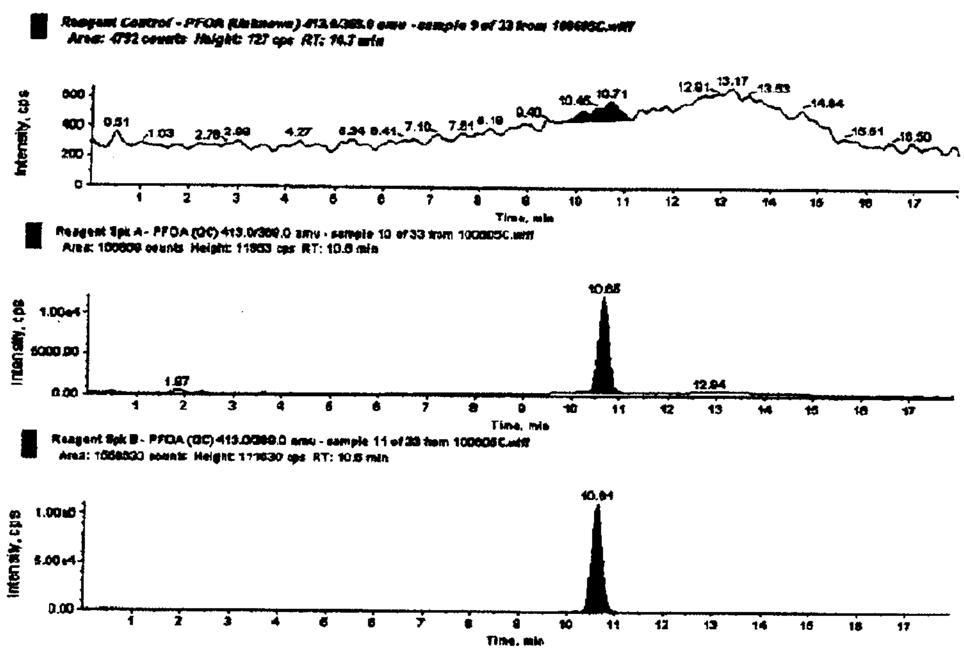


Figure 4. Chromatogram Representing a Sediment Sample Analyzed for PFOA (Exygen ID: C0085624, Data Set: 100605C)

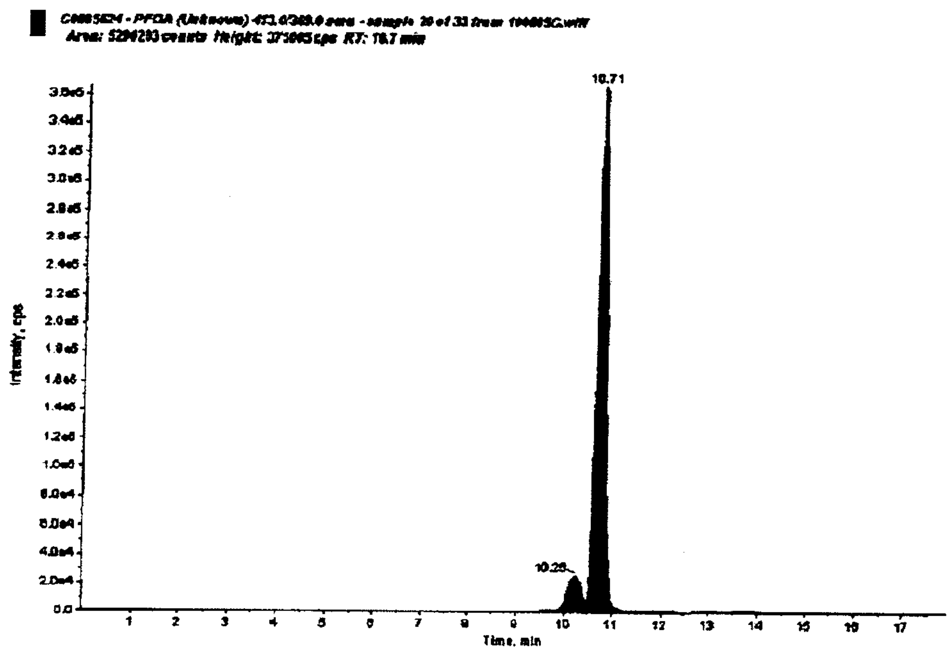


Figure 5. Chromatogram Representing a Surface Water Sample Analyzed for PFOA (Exygen ID: C0085595, Data Set: 092805D)

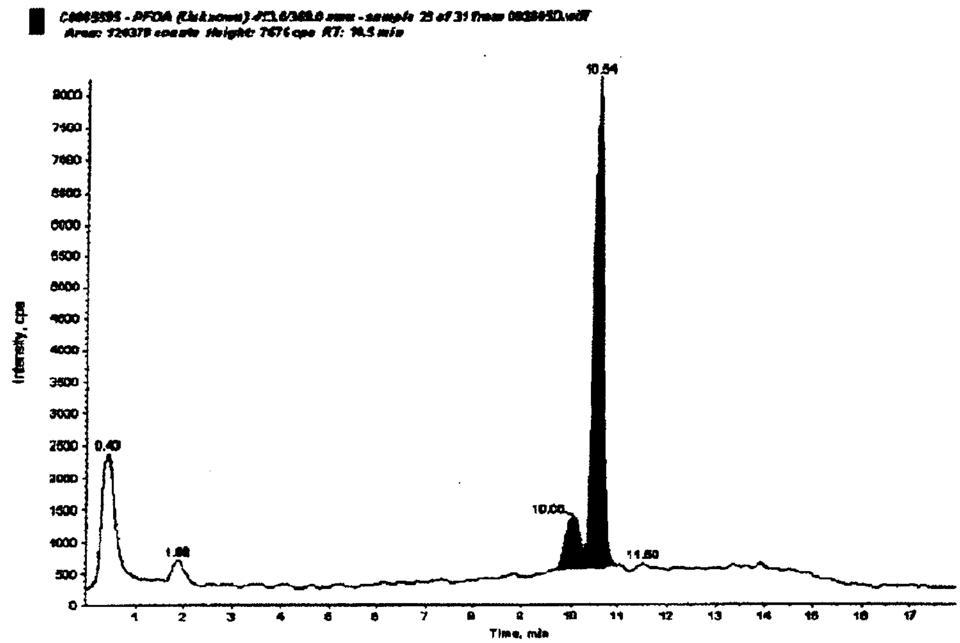


Figure 6. Typical Calibration Curve for ^{13}C PFOA in Reagent Water

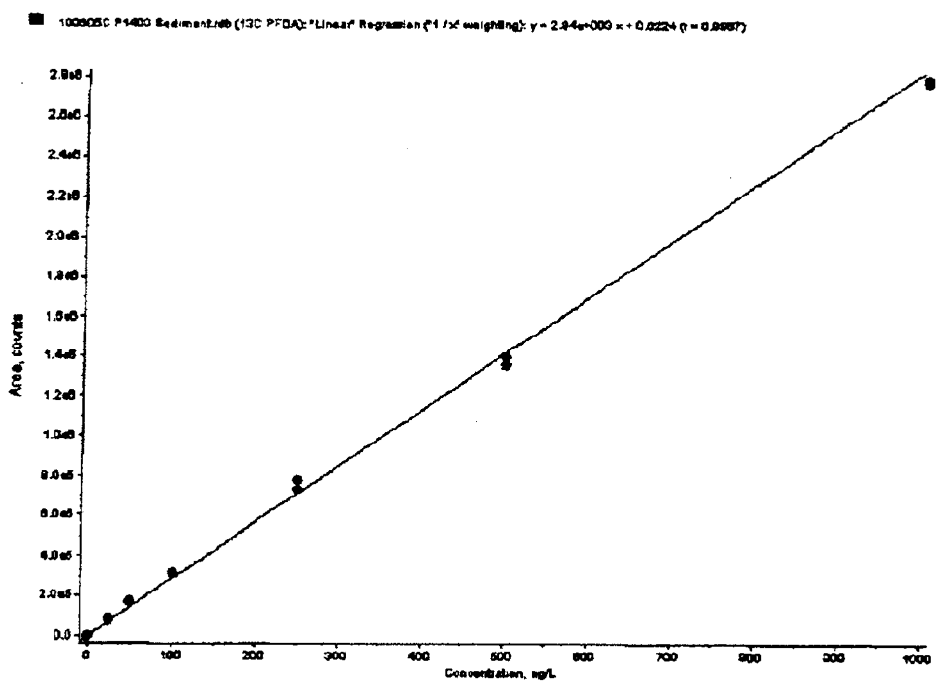


Figure 7. Extracted Standards of ^{13}C PFOA in Reagent Water, 25 ng/L and 50 ng/L, Respectively

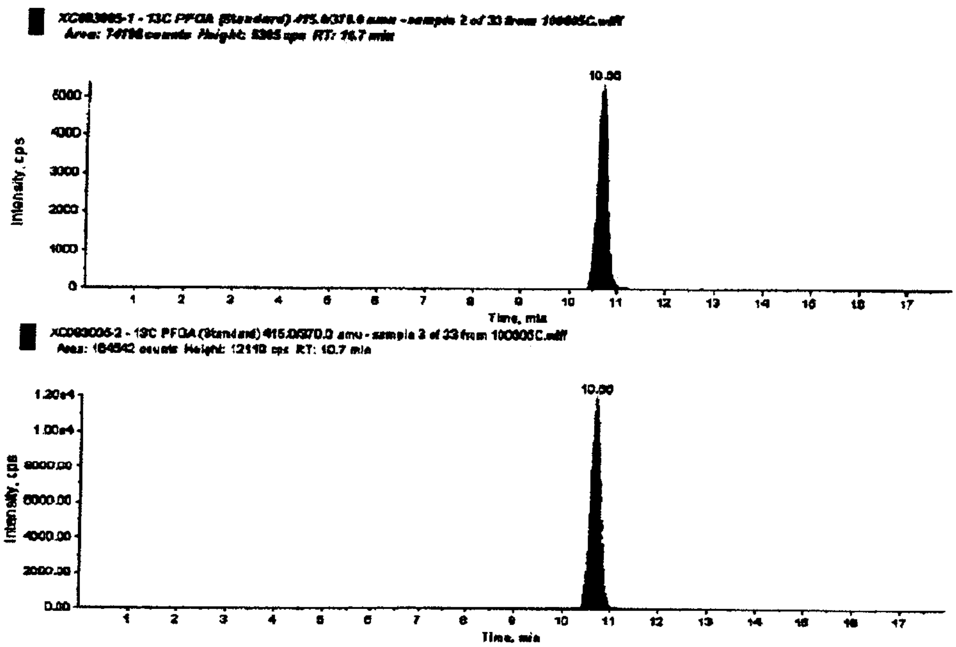


Figure 8. **^{13}C PFOA in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively**

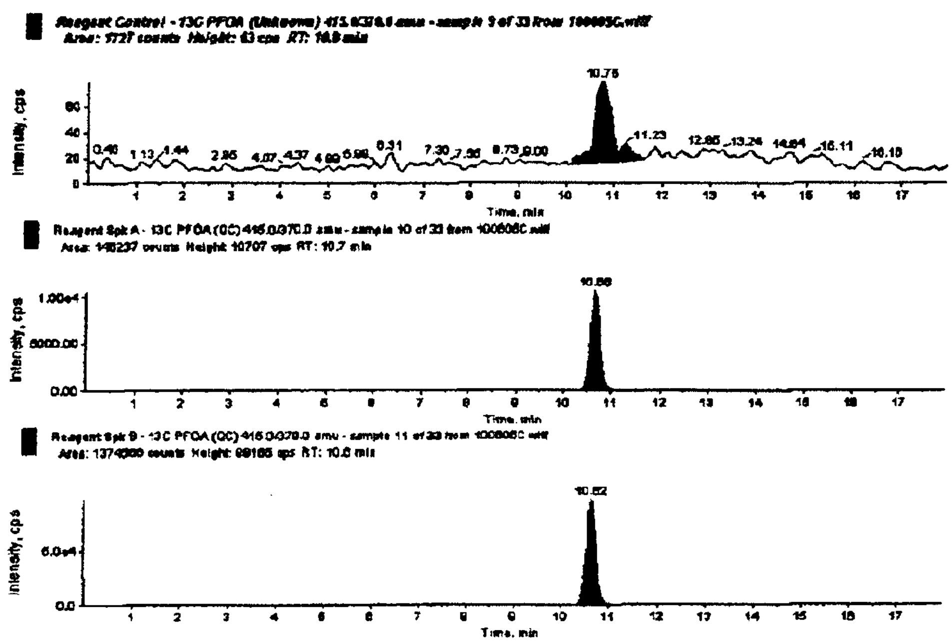


Figure 9. Chromatogram Representing a Sediment Sample Analyzed for ^{13}C PFOA (Exygen ID: C0085624, Data Set: 100605C)

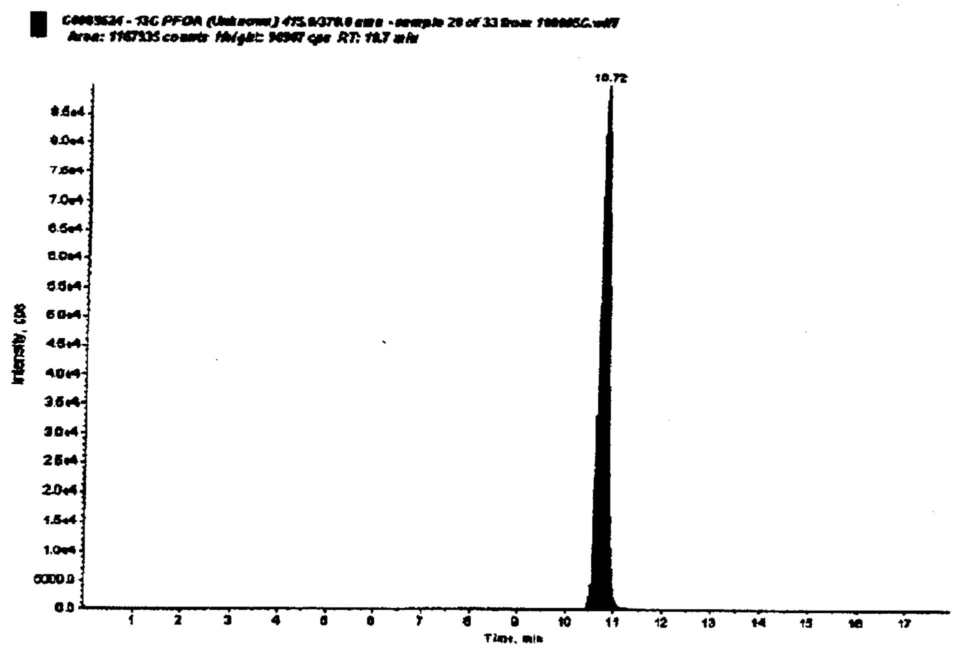
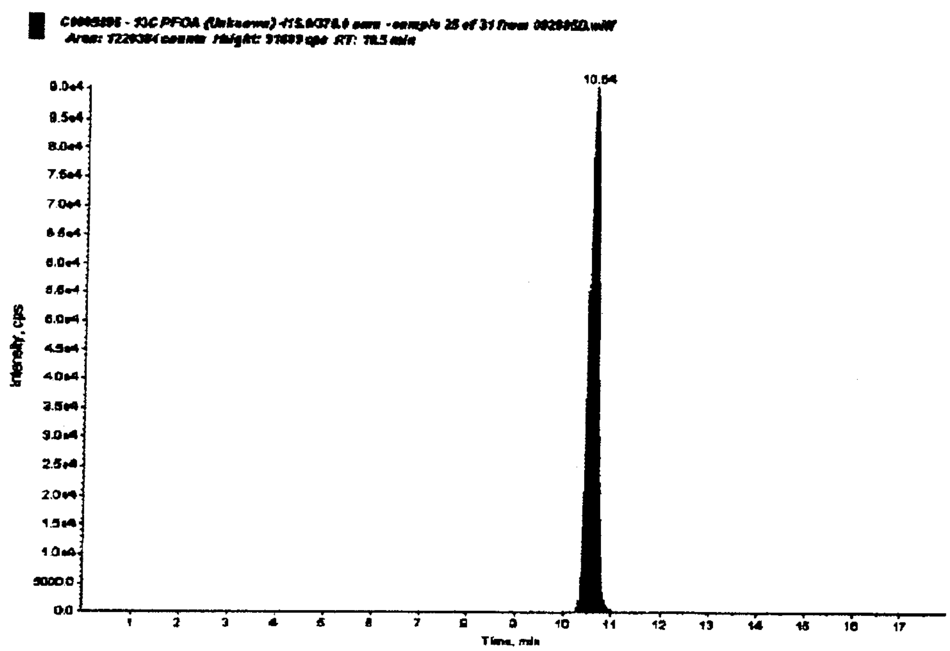


Figure 10. Chromatogram Representing a Surface Water Sample Analyzed for ^{13}C PFOA (Exygen ID: C0085595, Data Set: 092805D)



3MA01552206

2095.0429

Figure 11. Typical Calibration Curve for PFBS in Reagent Water

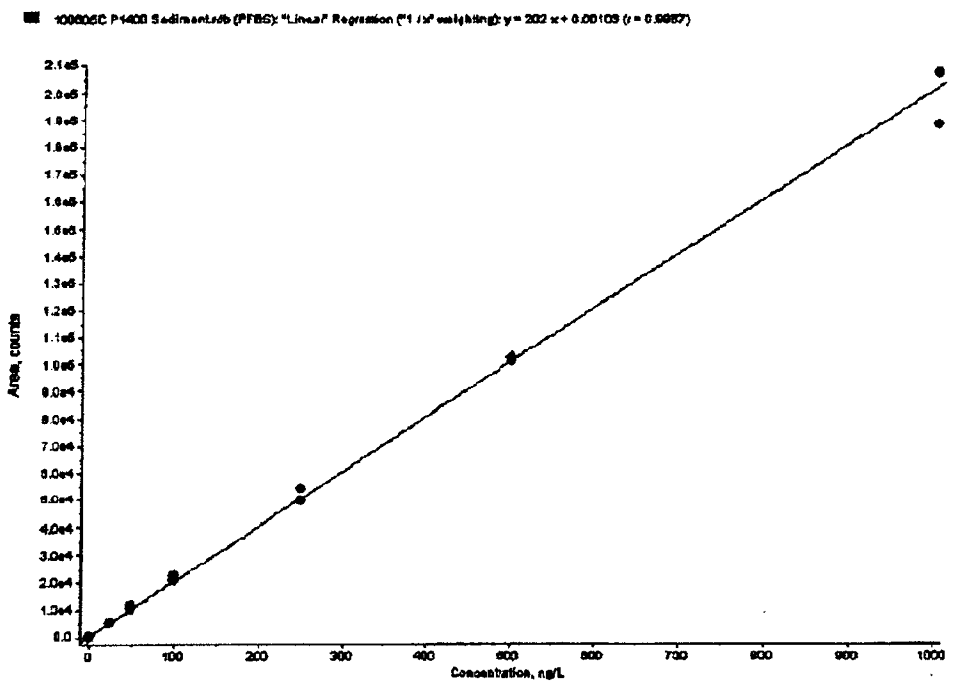
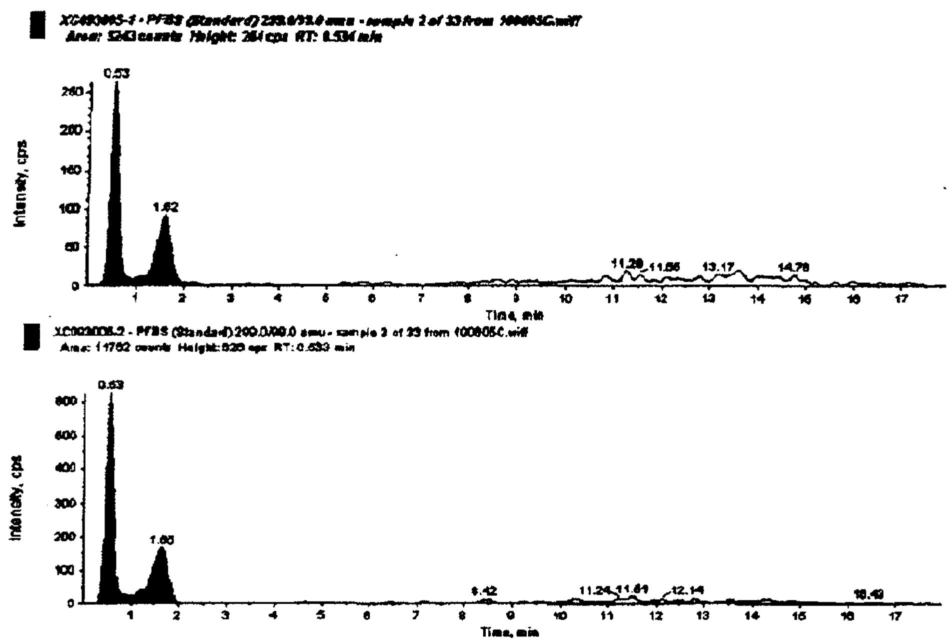


Figure 12. Extracted Standards of PFBS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



3MA01552208

2095.0431

Figure 13. PFBS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively

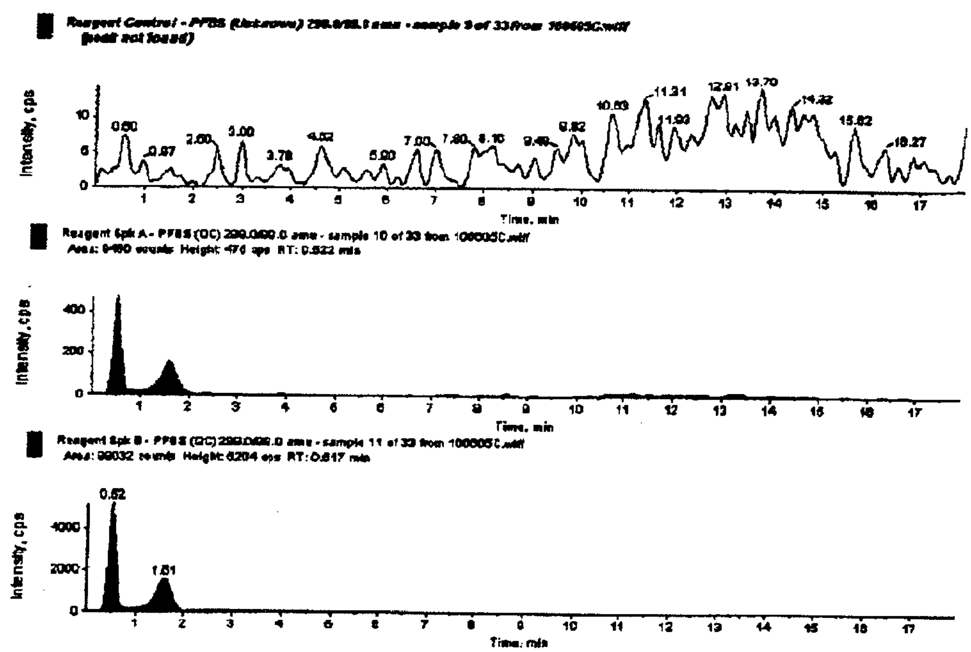


Figure 14. Chromatogram Representing a Sediment Sample Analyzed for PFBS (Exygen ID: C0085624, Data Set: 100605C)

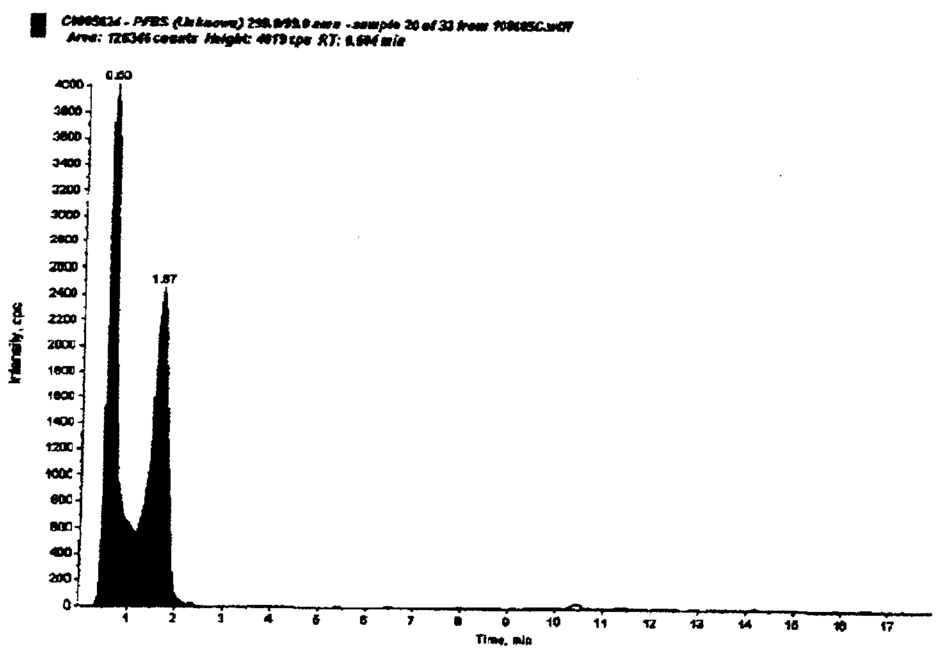
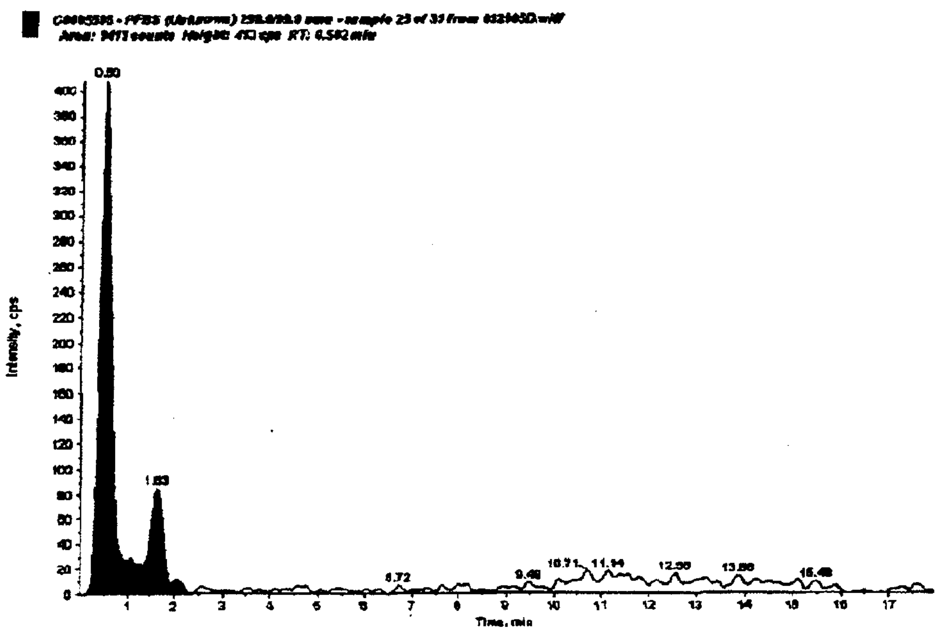


Figure 15. Chromatogram Representing a Surface Water Sample Analyzed for PFBS (Exygen ID: C0085595, Data Set: 092805D)



3MA01552211

2095.0434

Figure 16. Typical Calibration Curve for PFHS in Reagent Water

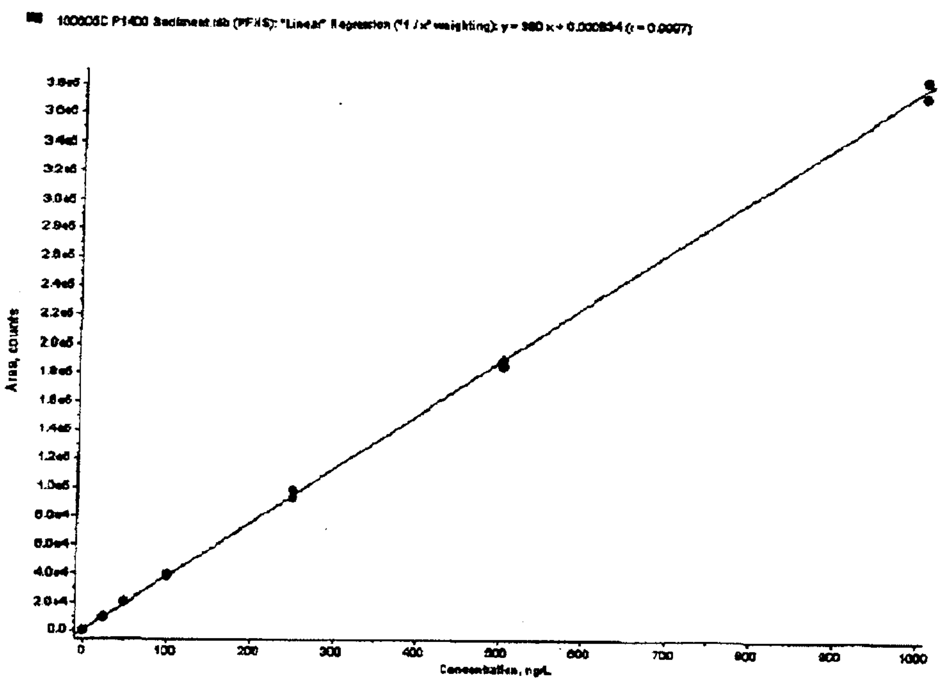
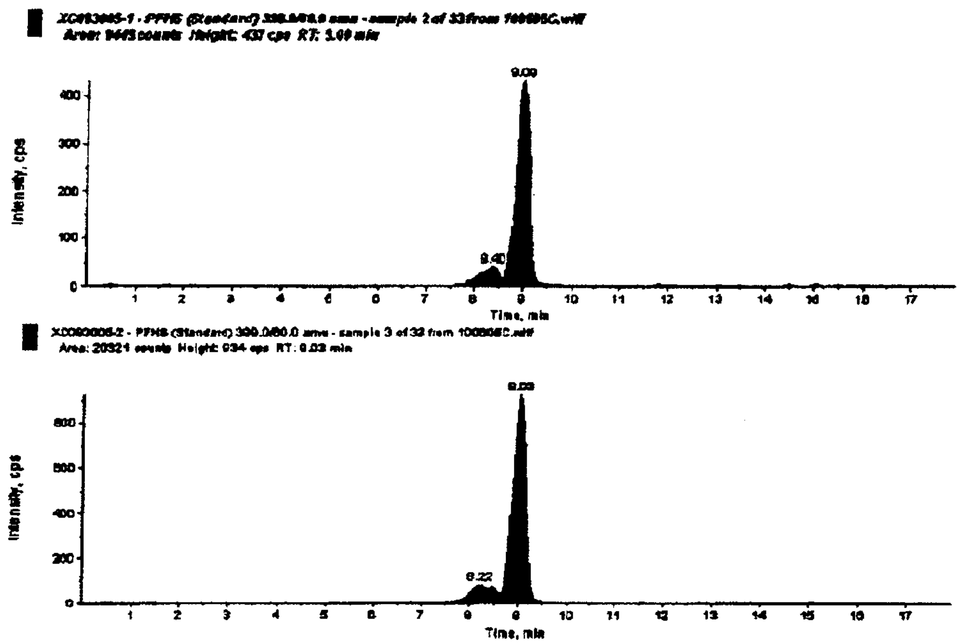


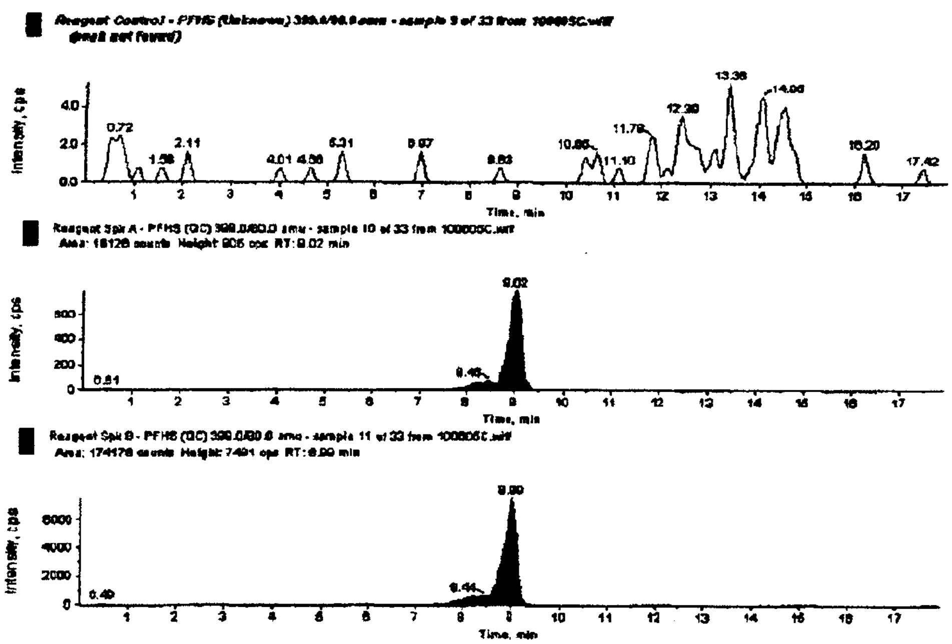
Figure 17. Extracted Standards of PFHS in Reagent Water, 25 ng/L and 50 ng/L, Respectively



3MA01552213

2095.0436

Figure 18. PFHS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



3MA01552214

2095.0437

Figure 19. Chromatogram Representing a Sediment Sample Analyzed for PFHS (Exygen ID: C0085624, Data Set: 100605C)

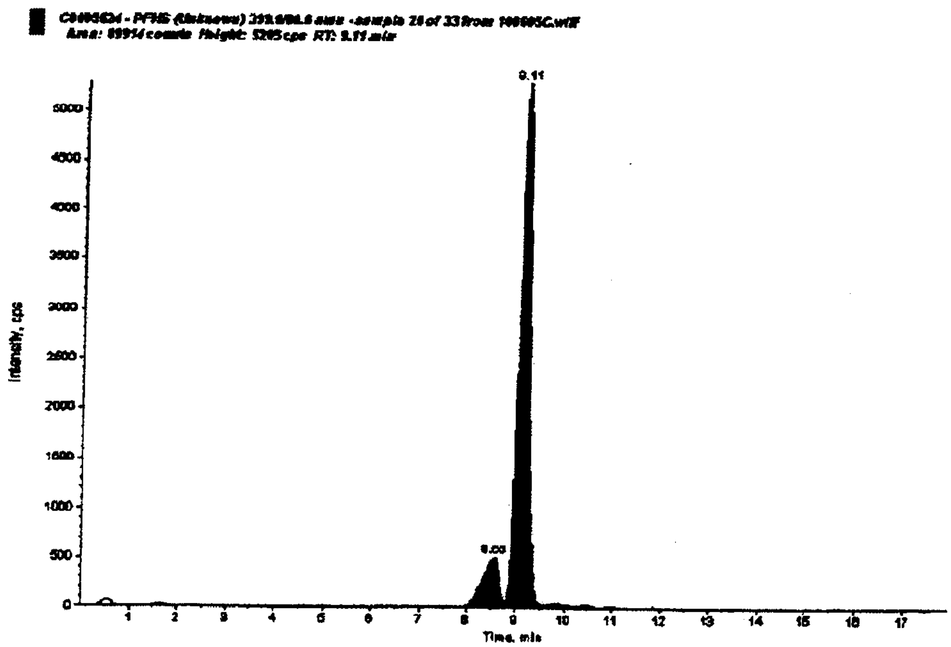


Figure 20. Chromatogram Representing a Surface Water Sample Analyzed for PFHS (Exygen ID: C0085595, Data Set: 092805D)

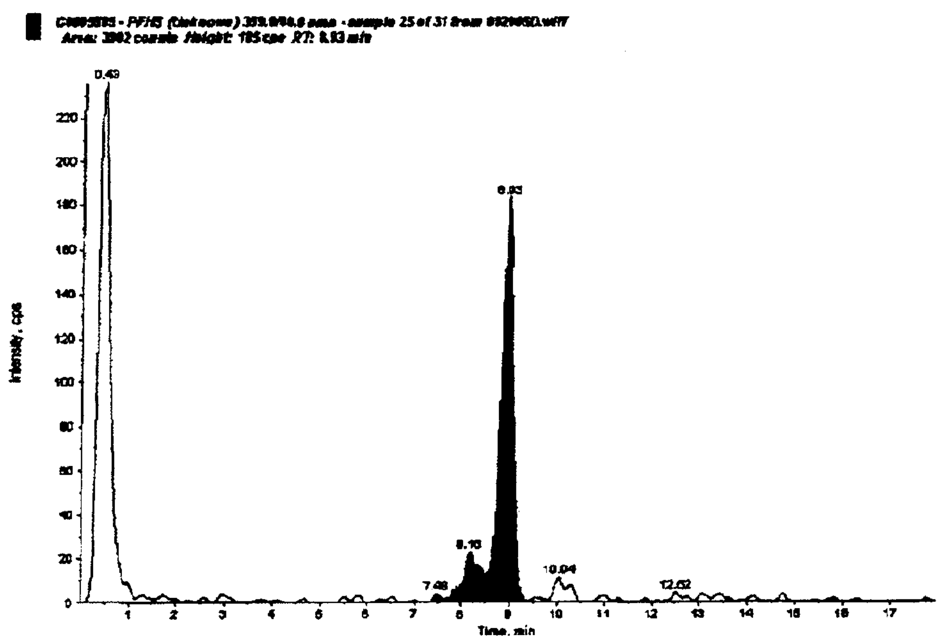


Figure 21. Typical Calibration Curve for PFOS in Reagent Water

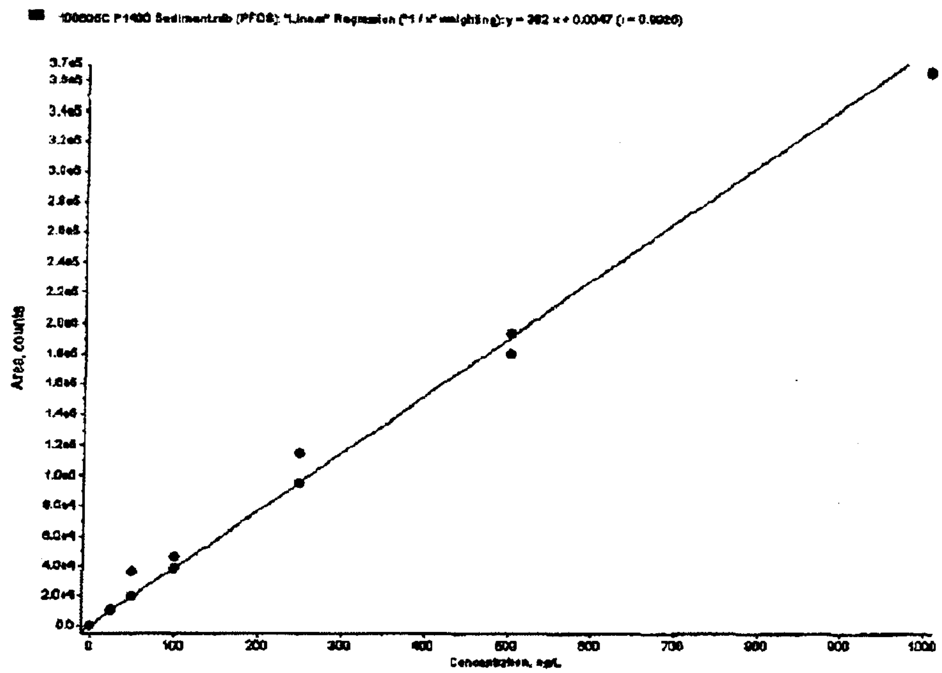


Figure 22. Extracted Standards of PFOS in Reagent Water, 25 ng/L and 50 ng/L, Respectively

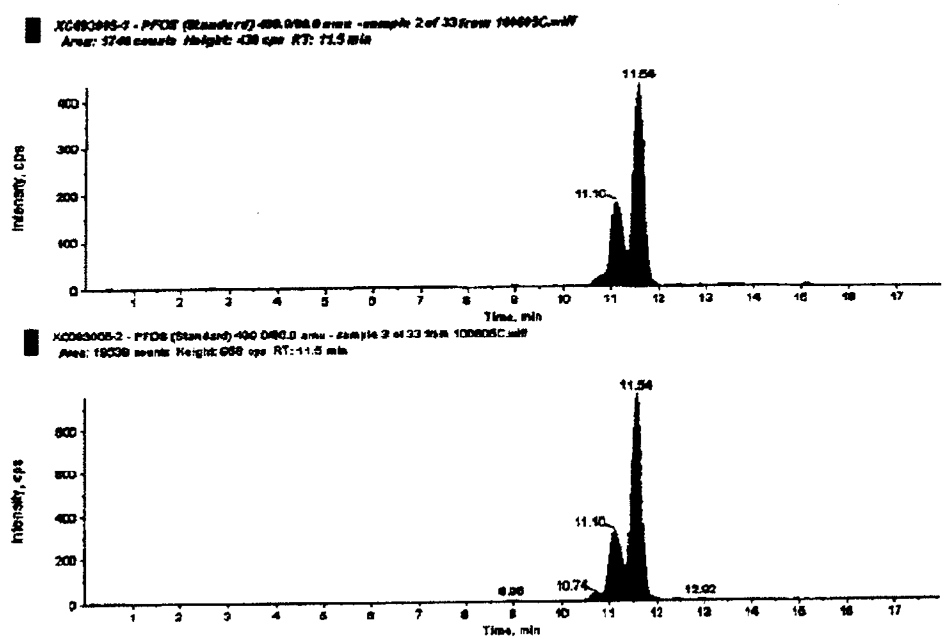
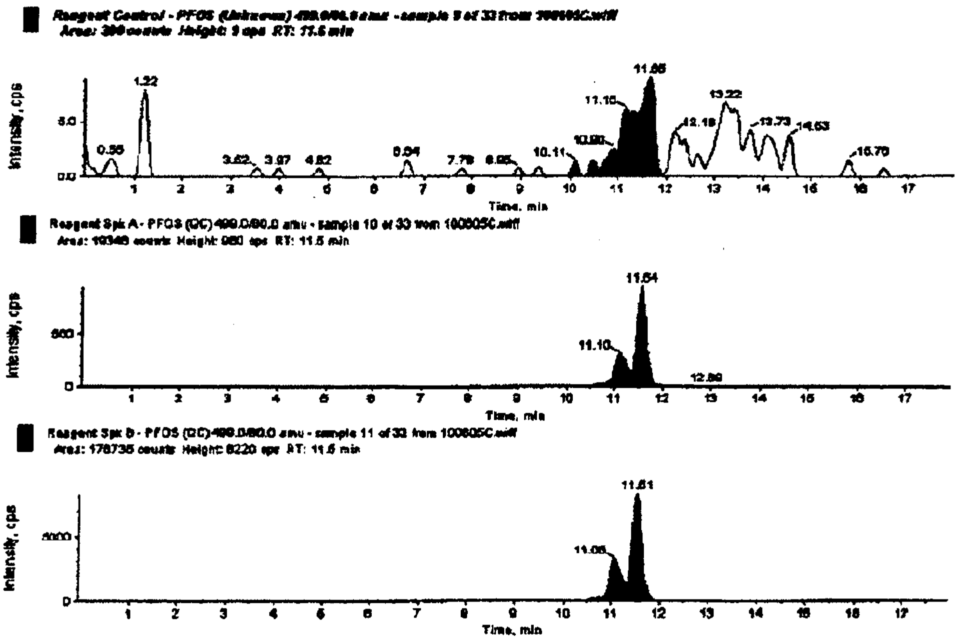


Figure 23. PFOS in Reagent Control, 50 ng/L Fortified Reagent Spike A, and 500 ng/L Fortified Reagent Spike B, Respectively



3MA01552219

2095.0442

Figure 24. Chromatogram Representing a Sediment Sample Analyzed for PFOS (Exygen ID: C0085624, Data Set: 100605C)

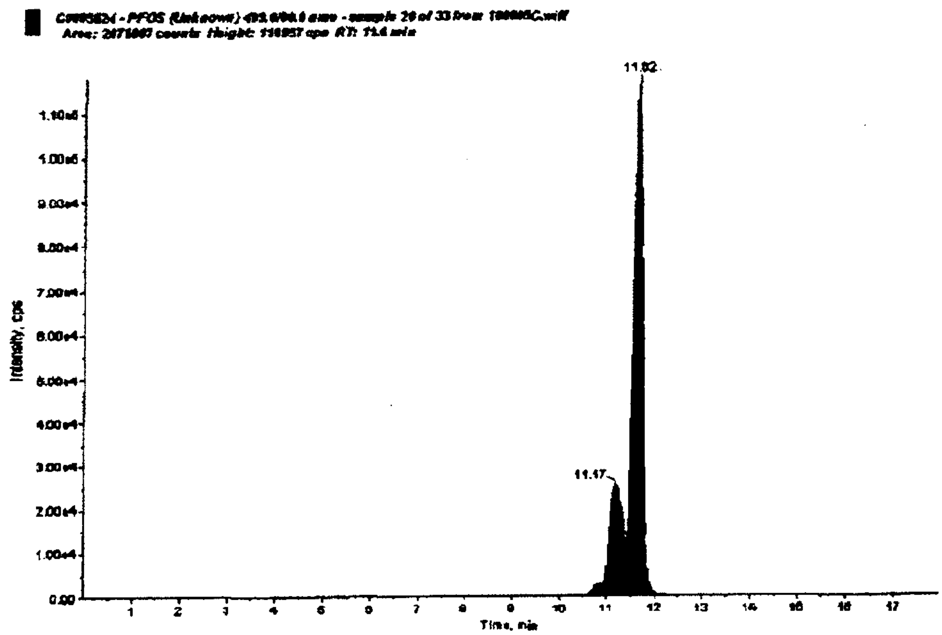
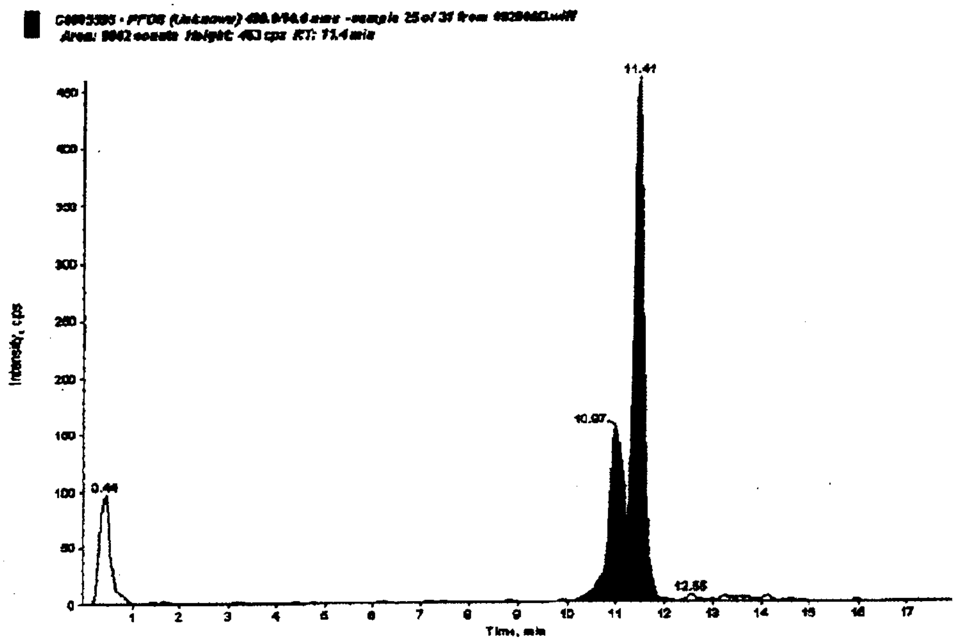


Figure 25. Chromatogram Representing a Surface Water Sample Analyzed for PFOS (Exygen ID: C0085595, Data Set: 092805D)



INTERIM REPORT #6 - Analysis of Cottage Grove Fish Samples

STUDY TITLE

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

DATA REQUIREMENTS

EPA TSCA Good Laboratory Practice Standards 40 CFR 792

STUDY DIRECTOR

Jaisimha Kesari P.E., DEE
Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380
Phone: 610-701-3761

INTERIM REPORT COMPLETION DATE

February 7, 2006

PERFORMING LABORATORY

Exygen Research
3058 Research Drive
State College, PA 16801
Phone: 814-272-1039

STUDY SPONSOR

3M Company
3M Building 0236-01-B-10
St. Paul, MN 55144
Phone: 651-733-6374

PROJECT

Protocol Number: P0001400
Exygen Study Number: P0001400

Total Pages: 130

GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

Exygen Study Number P0001400, entitled "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program," conducted for 3M Company, is being performed in compliance with EPA TSCA Good Laboratory Practice Standards 40 CFR 792 by Exygen Research.

John Flaherty
Principal Investigator
Exygen Research

2/7/06
Date

Jaisimha Kesari P.E., DEE
Study Director
Weston Solutions, Inc.

2/9/06
Date

Robert A. Paschke
Sponsor Representative
3M Company

2/9/06
Date

QUALITY ASSURANCE STATEMENT

Exygen Research's Quality Assurance Unit reviewed Exygen Study Number P0001400, entitled, "Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program". All reviewed phases[1] were inspected for conduct according to Exygen Research's Standard Operating Procedures, the Study Protocol, and all applicable Good Laboratory Practice Standards. All findings were reported to the Exygen Principal Investigator and Management and to the Study Director.

Phase	Date Inspected	Date Reported to Principal Investigator	Date Reported to Exygen Management	Date Reported to Study Director
14. Raw Data Review and Final Analytical Report Review	12/14-21/05	12/21/05	12/21/05	12/21/05
15. Raw Data Review and Final Analytical Report Review	02/03/06	02/07/06	02/07/06	02/07/06

Lydia Shaffer

Lydia Shaffer
Technical Lead, Quality Assurance Unit

02/07/06
Date

[1]Note: All in-lab inspections will be documented in the QA statement for the final analytical report at the conclusion of the study. This QA statement involves only the review of the interim report and associated raw data.

CERTIFICATION OF AUTHENTICITY

This interim report, for Exygen Study Number P0001400, is a true and complete representation of the raw data.

Submitted by: Exygen Research
3058 Research Drive
State College, PA 16801
(814) 272-1039

Principal Investigator, Exygen:

John M Flaherty 2/7/06

John Flaherty
Vice President
Exygen Research

Date

Exygen Research Facility Management:

Richard A. Grazzini 7-FEB-06

Richard A. Grazzini
President
Exygen Research

Date

Study Director, Weston Solutions, Inc.

Kesari 2/9/06

Jaisimha Kesari P.E., DEE
Weston Solutions, Inc.

Date

Sponsor Representative, 3M Company:

R.A. Paschke 2/9/06

Robert A. Paschke
Manager, 3M Corporate Environmental Programs

Date

STUDY IDENTIFICATION

Analysis of Perfluorooctanoic Acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS) in Water, Soil, Sediment, Fish, and Clams Using LC/MS/MS for the 3M Cottage Grove Monitoring Program

PROTOCOL NUMBER:	P0001400
EXYGEN STUDY NUMBER:	P0001400
TYPE OF STUDY:	Residue
SAMPLE MATRIX:	Fish
TEST SUBSTANCE:	Perfluorooctanoic acid (PFOA), Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHS), and Perfluorooctanesulfonate (PFOS)
SPONSOR:	3M Company 3M Building 0236-01-B-10 St. Paul, MN 55144
STUDY DIRECTOR:	Jaisimha Kesari P.E., DEE Weston Solutions, Inc. 1400 Weston Way West Chester, PA 19380
STUDY MONITOR:	Robert A. Paschke 3M Company 3M Building 42-02-E-27 St. Paul, MN 55144
PERFORMING LABORATORY:	Exygen Research 3058 Research Drive State College, PA 16801
ANALYTICAL PHASE TIMETABLE:	Study Initiation Date: 03/03/05 Interim Analytical Start Date: 10/18/05 Interim Analytical Termination Date: 01/27/06 Interim Report Completion Date: 02/07/06

PROJECT PERSONNEL

The Study Director for this project is Jaisimha Kesari at Weston Solutions, Inc. The following personnel from Exygen Research were associated with various phases of this interim portion of the study:

Name	Title
John Flaherty	Vice President
Karen Risha	Laboratory Supervisor
Chrissy Edwards	Technician
Mark Ammerman	Sample Custodian
Amy Sheehan	Associate Scientist
Mindy Cressley	Technician
Brittany Kravets	Technician
Christa Gallant	Technician
Eric Edwards	Sample Custodian

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1.0 SUMMARY

Exygen Research extracted and analyzed fish samples for the determination of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) according to Exygen Method V0001783 (**Appendix A**).

The limit of quantitation for PFOA, PFBS, PFHS and PFOS in fish was 0.5 ng/g for the five gram samples and 2.5 ng/g for the one gram samples.

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in fish samples are summarized in **Table I**.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the fish samples are detailed in **Tables II and III**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the fish samples were 95 ± 16%, 76 ± 14%, 99 ± 8% and 100 ± 22%, respectively. Fortification recoveries for ^{13}C PFOA in the fish samples are detailed in **Table IV**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the fish samples were 93 ± 19.

Twenty of the sixty-two samples submitted for analysis did not meet quality control criteria for at least one compound. Upon client request, samples C0096730 – C0096732 were re-extracted and analyzed for PFBS and ^{13}C PFOA. Initial results from analyses of samples with low sample mass due to the size of the individual specimens did not meet PFOA spike recovery criteria. Consequently, composite samples were prepared from the remaining tissue homogenate for reanalysis. Samples C0096735 – C0096739, C0096750, C0096753, C0096755, C0096758, C0096781 – C0096788 were combined into groups, based on sample site and fish species, and re-extracted and analyzed for PFOA and ^{13}C PFOA. For the exact groupings, see the correspondence section of the raw data package.

Analytical results for the analysis of PFOA and PFBS in the re-extracted fish samples are summarized in **Table V**.

Fortification recoveries for PFOA and PFBS in the re-extracted fish samples are detailed in **Table VI**. The average percent recoveries ± standard deviations for PFOA and PFBS in the re-extracted fish samples were 111 ± 11% (n=12) and 85 ± 62% (n=3), respectively. Fortification recoveries for ^{13}C PFOA in the re-extracted fish samples are detailed in **Table VII**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the re-extracted fish samples were 99 ± 17%.

2.0 OBJECTIVE

The objective of the analytical part of this study was to determine levels of perfluorooctanoic acid (PFOA), perfluorobutanesulfonate (PFBS), perfluorohexanesulfonate (PFHS), and perfluorooctanesulfonate (PFOS) in fish according to Protocol P0001400 (**Appendix A**).

3.0 INTRODUCTION

This report details the results of the analysis for the determination of PFOA, PFBS, PFHS and PFOS in fish using the analytical method entitled, "V0001783: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Fish and Clams by LC/MS/MS."

The study was initiated on March 03, 2005, when the study director signed protocol number P0001400. The analytical start date for this interim report was October 18, 2005, and the analytical termination date for this interim report was January 27, 2006.

4.0 ANALYTICAL TEST SAMPLES

Sixty-two fish samples (Exygen ID C0096695 – C0096742, C0096744, C0096747, C0096750, C0096753, C0096755, C0096758, C0096781 – C0096788) were received on dry ice September 14, 2005 from Charles Young at Weston Solutions, Inc. Sample ID coding included a five or six character set with the first character describing the sample location (Reach 1, 3, 5) followed by two characters describing the species of fish (IP = *Ictalurus punctatus* [channel catfish], MD = *Micropterus dolomieu* [smallmouth bass] and LM = *Lepomis macrochirus* [bluegill sunfish]) and a fourth character describing the type of sample (F = filet tissue, W = whole body tissue). The last two characters describe either the specimen number (01-05) for individual sample analyses or a composite sample (C) consisting of individual samples composited for reanalysis. A whole Whiting (Family: Gadidae) was purchased from a local grocer by Ed Carns on December 20, 2004 and was used as the control fish (Exygen ID C0054391). The samples were logged in by Exygen personnel and placed in frozen storage.

Sample login and chain of custody information is located in the raw data package associated with this interim report. Storage records will be kept at Exygen Research.

5.0 REFERENCE MATERIAL

The analytical standard, PFOA, was purchased from Oakwood Products, Inc. and was received at Exygen on March 17, 2004. The surrogate spiking standard, ^{13}C labeled perfluorooctanoic acid (^{13}C PFOA), was received at Exygen on April 15, 2004 from the 3M Company. 3M supplied the analytical standards PFBS and PFHS. PFBS was received from 3M at Exygen on May 13, 2005. PFHS was received from 3M at Exygen on January 20, 2003. PFOS was purchased from Fluka Corporation and was received at Exygen on April 23, 2003.

The available information for the reference materials is listed below. PFOA was stored ambient. PFBS, PFHS and ^{13}C PFOA were stored frozen and PFOS was stored refrigerated.

Compound	Exygen Inventory No.	Lot #	Purity (%)	Expiration Date
PFOA	SP0005444	203	99	03/31/07
^{13}C PFOA	SP0004184	3507-195	97	03/29/09
PFBS	SP0005726	101	96.7	12/04/06
PFHS	SP0002401	SE036	98.6	10/18/06
PFOS	SP0002694	430180/1	101.2	10/31/07

The molecular structures of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS are given on the following pages:

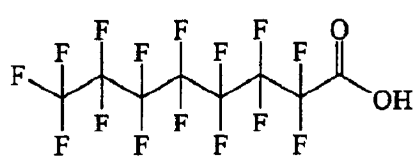
PFOA

Chemical Name: Perfluorooctanoic acid

Molecular Weight: 414

Transitions Monitored: 413 → 369 (for quantification) and
413 → 219 (for confirmation)

Structure:

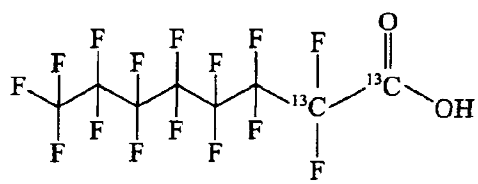


^{13}C PFOA

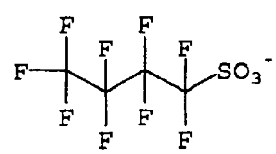
Chemical Name: 1,2-13C perfluorooctanoic acid

Molecular Weight: 416

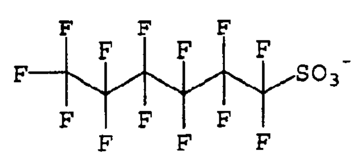
Transition Monitored: 415 → 370
Structure:



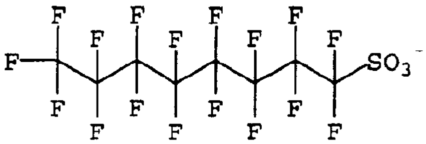
PFBS
Chemical Name: Perfluorobutanesulfonate
Molecular Weight: 338 supplied as the potassium salt ($C_4F_9SO_3^-K^+$)
Transitions Monitored: 299 → 99
Structure:



PFHS
Chemical Name: Perfluorohexanesulfonate
Molecular Weight: 438 supplied as the potassium salt ($C_6F_{13}SO_3^-K^+$)
Transitions Monitored: 399 → 80
Structure:



PFOS
Chemical Name: Perfluorooctanesulfonate
Molecular Weight: 538 supplied as the potassium salt ($C_8F_{17}SO_3^-K^+$)
Transitions Monitored: 499 → 80
Structure:



6.0 DESCRIPTION OF ANALYTICAL METHOD

The analytical method "V0001783: Method of Analysis for the Determination of Perfluorooctanoic Acid (PFOA) in Fish and Clams by LC/MS/MS" was used for this study.

6.1 Extraction Procedure for Fish

6.1.1 Sample Preparation

Before the samples could be weighed for the extraction, they had to be processed. To process, the frozen samples were placed into a food processor and homogenized with dry ice. The samples were transferred to one-gallon Ziploc bags and placed in frozen storage with bag left open to allow the dry ice to sublime. After sublimation, the sample bags were sealed and remained in frozen storage until time of analysis. Sample processing records are located in the Sample Information section of the raw data package.

6.1.2 Glassware Preparation

The 125 mL pear-shaped flasks were silanized by first rinsing the flask with 30% dimethyldichlorosilane in toluene solution. The flasks were rinsed once with toluene followed by three rinses with methanol. The flasks were allowed to air dry before use.

6.1.3 Column Preparation

The 20 mL columns were packed at Exygen in sequence with 2 grams florisil, 2 grams silica gel, 2 grams of carbon, and 1 gram LC-NH_2. The columns were conditioned on the day of extraction with 20 mL of methanol followed by 20 mL of acetonitrile. All washes were discarded. These clean-up columns were used to remove matrix interference and not to retain PFOA and ^{13}C PFOA. Additional details about the column packing materials can be found in the raw data package associated with this report.

6.1.4 *Sample Extraction*

A 5-gram* portion of fish sample was weighed into a fifty-milliliter centrifuge tube for the extraction. After fortification of appropriate samples, 30 mL of acetonitrile was added to the samples. The samples were allowed to shake on a wrist action shaker for ~15 minutes. The samples were placed into a freezer for ~1 hour. Freezing of the samples allowed the fats and proteins to precipitate. The samples were centrifuged for ~10 minutes at ~2000 rpm. The supernatant was then loaded onto the conditioned clean-up column fitted inside the silanized pear shaped flask. The eluate was collected in the silanized pear-shaped flask. This process removed the fats and proteins from the extract. Ten milliliters of acetonitrile was added to the samples left in the centrifuge tube. The remaining sample in the tube was homogenized using a tissumizer for ~30 seconds. The tissumizer was rinsed with ten milliliters of acetonitrile. The rinse was added to the sample tube. The samples were allowed to shake on a wrist action shaker for another 10 minutes. The samples were placed into a freezer for ~1 hour. The samples were centrifuged again for ~10 minutes at ~2000 rpm. The supernatant was then loaded onto the same clean-up column. The eluate was collected into the same pear-shaped flask. The column was washed with 20 mL of acetonitrile, collecting the wash in the pear-shaped flask. Approximately 3 or 4 drops of 1-octanol was added to the extracts in the flasks. The samples were evaporated using a rotary evaporator at reduced pressure. The 1-octanol held the analytes in the pear-shaped flask while the solvent evaporated. Two milliliters of 2% ascorbic acid in methanol was added to the flasks to make final volume. The flask was swirled to dissolve and mix the sample. The sample was transferred to a HPLC vial using a disposable pipet. Each sample was analyzed by LC/MS/MS electrospray.

*Due to lack of sample, a one-gram portion of samples C0096735 – C0096739, C0096750, C0096753, C0096755, C0096758, C0096781 – C0096788 were used. All other samples were weighed out in 5-gram portions.

6.2 Preparation of Standards and Fortification Solutions

A mixed stock standard solution of PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS was prepared at a concentration of 1000 µg/mL by dissolving 100 mg of each of the standards (corrected for purity and salt content, if necessary) in methanol. From this solution, a 100 µg/mL fortification standard solution was prepared by taking 10 mL of the stock and bringing the volume up to 100 mL with methanol. By taking 10 mL of the 100 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 10 µg/mL fortification standard was prepared. By taking 10 mL of the 10 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 1.0 µg/mL fortification standard were prepared. By taking 10 mL of the 1.0 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.1 µg/mL fortification standard was prepared. By taking 10 mL of the 0.1 µg/mL fortification standard and bringing the volume up to 100 mL with methanol, a 0.01 µg/mL fortification standard were prepared.

An additional stock solution of ^{13}C PFOA was prepared at 100 µg/mL and diluted to 1.0 and 0.1 µg/mL for spiking purposes. Complete details can be found in the raw data package associated with this study.

A set of non-extracted standards containing PFOA, ^{13}C PFOA, PFBS, PFHS and PFOS were prepared in methanol. The following concentrations were prepared:

Conc. of Fort Solution (µg/mL)[1]	Volume (mL)	Final Volume (mL)	Final Conc. of Calibration Std. (µg/mL)
1.0	5.0	100	0.05
1.0	2.5	100	0.025
1.0	1.0	100	0.01
0.05	10	100	0.005
0.025	10	100	0.0025
0.01	10	100	0.001
0.005	10	100	0.0005

[1] of PFOA and ^{13}C PFOA

The stock standard solution and all fortification and calibration standard solutions were stored in a refrigerator (4° ± 2°C) when not in use. Documentation of standard preparation is located in the raw data package associated with this interim report.

6.3 Chromatography

Quantification of PFOA, PFBS, PFHS and PFOS was accomplished by LC/MS/MS electrospray. The retention time of PFOA, PFBS, PFHS and PFOS was ~11 min, ~2.5 mins, ~8.9 mins, and ~11.4 mins, respectively. Peaks above the LOD were not detected in any of the control blank samples corresponding to the analyte retention time.

6.4 Instrument Sensitivity

The smallest standard amount injected during the chromatographic run had a concentration of 0.5 ng/mL of PFOA, PFBS, PFHS, PFOS and ^{13}C PFOA.

6.5 Description of LC/MS/MS Instrument and Operating Conditions

Instrument: API 4000 Biomolecular Mass Analyzer

Interface: Turbo Ion Spray Liquid Introduction Interface

Computer: DELL OptiPlex GX400

Software: Windows NT, Analyst 1.4.1

HPLC: Hewlett Packard (HP) Series 1100
HP Quat Pump
HP Vacuum Degasser
HP Autosampler
HP Column Oven

HPLC Column: Thermo Fluophase RP, 50 mm x 2.1 mm
Column Temp.: 30° C
Injection Vol.: 15 µL
Mobile Phase (A): 2 mM Ammonium Acetate in water
Mobile Phase (B): Methanol

Time (min)	% A	% B
0.0	65	35
1.0	65	35
8.0	25	75
10.0	25	75
11.0	65	35
18.0	65	35

Total run time: ~18 min
Flow Rate: 0.3 mL/min
Ions monitored:

Analyte	Mode	Transition Monitored	Approximate Retention Time (min)
PFOA	negative	413 → 369	~11 min.
PFOA Confirm Ion	negative	413 → 219	~11 min.
^{13}C PFOA	negative	415 → 370	~11 min.
PFBS	negative	299 → 99	~2.5 min.
PFHS	negative	399 → 80	~8.9 min.
PFOS	negative	499 → 80	~11.4 min.

6.6 Quantitation and Example Calculation

Fifteen microliters of sample or calibration standard were injected into the LC/MS/MS. The peak area was measured and the standard curve was generated (using 1/x fit weighted linear regression) by Analyst software using six concentrations of standards. The concentration was determined from the equations below.

Equation 1 calculated the amount of analyte found (in ng/mL, based on peak area) using the standard curve (linear regression parameters) generated by the Analyst software program.

Equation 1:

$$\text{Analyte found (ng/mL)} = \frac{\text{(Peak area - intercept)}}{\text{slope}} \times \text{DF}$$

Where: DF = Dilution Factor, factor by which the final volume was diluted, if necessary.

Equation 2 was used to convert the amount of analyte found in ng/mL to ng/g (ppb, wet weight).

Equation 2:

$$\text{Analyte found (ppb, wet weight)} = \frac{[\text{Analyte found (ng/mL)} \times \text{final volume (2 mL)}]}{\text{sample weight (5 g)*}}$$

*One gram for samples for which 1g was used for extraction.

For samples fortified with known amounts of analyte prior to extraction, Equation 3 was used to calculate the percent recovery.

Equation 3:

$$\text{Recovery (\%)} = \frac{\text{(analyte found (ng/g) - analyte in control (ng/g))}}{\text{amount added (ng/g)}} \times 100\%$$

Note: For the analyte recovery calculation, the "control" is the unspiked aliquot of the primary field sample.

An example of a calculation using an actual sample follows:

Fish sample Exygen ID C0096695 Spk D (Set: 101805A), fortified at 100 ng/g with PFOA where:

peak area	=	7428926
intercept	=	79100
slope	=	292000
dilution factor	=	10
ng/g analyte added (fort level)	=	100
amt in corresponding sample (ng/g)	=	0.808
final volume (mL)	=	2
sample weight (g)	=	5

From equation 1:

Analyte found (ng/mL) $= \dfrac{[7428926 - 79100] \times 10}{292000}$

$= 252$ ng/mL

From equation 2:

Analyte found ng/g (ppb, wet weight) $= \dfrac{(252 \text{ ng/mL} \times 2 \text{ mL})}{5 \text{ g}}$

$= 101$ ng/g (ppb)

From equation 3:

% Recovery $= \dfrac{(101 \text{ ng/g} - 0.808 \text{ ng/g})}{100 \text{ ng/g}} \times 100\%$

$= 100$ %

7.0 EXPERIMENTAL DESIGN

^{13}C PFOA was used as a surrogate for all the samples. ^{13}C PFOA was added to the fish samples in the laboratory after the samples were weighed for extraction. For fish samples designated as laboratory matrix spikes PFOA, PFBS, PFHS, and PFOS were also added at a known concentration to the samples in the laboratory after the samples were weighed for extraction.

The fish samples were extracted in eighteen sets, five of which were re-extraction sets. Each set included one control fish matrix blank and two control fish matrix blanks fortified at known concentrations. The first eleven sets of fish contained five samples each. Set twelve contained four samples and set thirteen contained three samples. Sets 14-16 each contained a re-extraction for one sample. Sets 17-18 contained the re-extracted and composited samples that were originally not reported due to quality control failure. Set seventeen contained re-extractions for three samples and extraction of two composite samples. Set eighteen contained extractions for four composite samples.

Accuracies were assessed for each sample by reviewing the individual QC results obtained for each sample. There were two laboratory spike recovery results available for each sample that were used to assess the accuracy. There were four individual ^{13}C PFOA recovery results per sample that were also used to assess the accuracy. In cases where the sample level significantly exceeded spiking level (> 3 times the spiking level), accurate recoveries could not be calculated and assessed accuracy was based on ^{13}C PFOA recovery. Twenty of the sixty-two samples submitted for analysis did not meet quality control criteria for at least one compound. Upon client request, samples C0096730 – C0096732 were re-extracted and analyzed for PFBS and ^{13}C PFOA. Initial results from analyses of samples with low sample mass due to the size of the individual specimens did not meet PFOA spike recovery criteria. Consequently, composite samples were prepared from the remaining tissue homogenate for reanalysis. Samples C0096735 – C0096739, C0096750, C0096753, C0096755, C0096758, C0096781 – C0096788 were combined into groups, based on sample site and fish species, and re-extracted and analyzed for PFOA and ^{13}C PFOA. For the exact groupings, see the correspondence section of the raw data package.

8.0 RESULTS

Analytical results and assessed accuracies for the analysis of PFOA, PFBS, PFHS, and PFOS in fish samples are summarized in **Table I**.

Fortification recoveries for PFOA, PFBS, PFHS and PFOS in the fish samples are detailed in **Tables II and III**. The average percent recoveries ± standard deviations for PFOA, PFBS, PFHS and PFOS in the fish samples were 95 ± 16%, 76 ± 14%, 99 ± 8% and 100 ± 22%, respectively. Fortification recoveries for ^{13}C PFOA in the fish samples are detailed in **Table IV**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the fish samples were 93 ± 19.

Analytical results for the analysis of PFOA and PFBS in the re-extracted fish samples are summarized in **Table V**.

Fortification recoveries for PFOA and PFBS in the re-extracted fish samples are detailed in **Table VI**. The average percent recoveries ± standard deviations for PFOA and PFBS in the re-extracted fish samples were 111 ± 11% (n=12) and 85 ± 62% (n=3), respectively. Fortification recoveries for ^{13}C PFOA in the re-extracted fish samples are detailed in **Table VII**. The average percent recoveries ± standard deviations for ^{13}C PFOA in the re-extracted fish samples were 99 ± 17%.

9.0 CONCLUSIONS

The fish samples were successfully extracted and analyzed for PFOA, PFBS, PFHS and PFOS according to analytical method V0001783. There were no circumstances that may have affected the data quality or integrity.

10.0 RETENTION OF DATA AND SAMPLES

All original paper data generated by Exygen Research that pertains to this interim report will be shipped to the study director. This does not include facility-specific raw data such as instrument or temperature logs. Exact copies of all raw data, as well as a signed copy of the interim analytical report and all original facility-specific raw data, will be retained in the Exygen Research archives for the period of time specified in EPA TSCA Good Laboratory Practice Standards 40 CFR 792.

TABLES

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Fish Samples

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)
C0096695	CGMN-F01-1IPW01-0-050812	0.696	40	ND	30	17.0	30	0.808	30
C0096695 Rep	CGMN-F01-1IPW01-0-050812*	0.772	40	ND	30	19.6	30	0.812	30
C0096696	CGMN-F01-1IPW02-0-050812	0.620	30	ND	30	32.2	30	0.932	30
C0096696 Rep	.CGMN-F01-1IPW02-0-050812*	0.508	30	ND	30	32.2	30	1.01	30
C0096697	CGMN-F01-1IPW03-0-050812	ND	30	ND	30	14.3	40	0.900	30
C0096697 Rep	CGMN-F01-1IPW03-0-050812*	ND	30	ND	30	19.6	40	1.10	30
C0096698	CGMN-F01-1IPW04-0-050812	ND	40	ND	30	14.9	30	1.07	30
C0096698 Rep	CGMN-F01-1IPW04-0-050812*	ND	40	ND	30	17.2	30	1.01	30
C0096699	CGMN-F01-1IPW05-0-050812	ND	30	ND	30	10.5	30	0.712	40
C0096699 Rep	CGMN-F01-1IPW05-0-050812*	ND	30	ND	30	11.5	30	1.05	40
C0096700	CGMN-F01-3IPW01-0-050812	ND	30	2.34	30	552	40	1.54	30
C0096700 Rep	CGMN-F01-3IPW01-0-050812*	ND	30	1.88	30	488	40	1.62	30
C0096701	CGMN-F01-3IPW02-0-050812	ND	30	ND	30	45.2	30	0.836	40
C0096701 Rep	CGMN-F01-3IPW02-0-050812*	ND	30	ND	30	38.0	30	0.724	40
C0096702	CGMN-F01-3IPW03-0-050812	ND	30	ND	30	17.0	30	1.14	30
C0096702 Rep	CGMN-F01-3IPW03-0-050812*	ND	30	ND	30	18.2	30	1.05	30
C0096703	CGMN-F01-3IPW04-0-050812	ND	30	ND	30	31.6	30	1.37	30
C0096703 Rep	CGMN-F01-3IPW04-0-050812*	ND	30	ND	30	29.8	30	1.35	30
C0096704	CGMN-F01-3IPW05-0-050812	ND	30	ND	30	11.8	30	0.732	40
C0096704 Rep	CGMN-F01-3IPW05-0-050812*	ND	30	ND	30	13.3	30	0.816	40
C0096705	CGMN-F01-5IPW01-0-050812	ND	40	ND	30	54.4	30	1.26	30
C0096705 Rep	CGMN-F01-5IPW01-0-050812*	ND	40	ND	30	54.4	30	1.56	30
C0096706	CGMN-F01-5IPW02-0-050812	ND	40	0.884	30	124	30	1.93	30
C0096706 Rep	CGMN-F01-5IPW02-0-050812*	ND	40	1.00	30	128	30	1.92	30
C0096707	CGMN-F01-5IPW03-0-050812	ND	40	1.06	30	313	30	2.56	30
C0096707 Rep	CGMN-F01-5IPW03-0-050812*	ND	40	1.03	30	326	30	2.40	30
C0096708	CGMN-F01-5IPW04-0-050812	ND	40	ND	30	125	30	2.55	30
C0096708 Rep	CGMN-F01-5IPW04-0-050812*	ND	40	ND	30	125	30	2.52	30
C0096709	CGMN-F01-5IPW05-0-050812	ND	50	ND	30	38.9	30	2.15	30
C0096709 Rep	CGMN-F01-5IPW05-0-050812*	ND	50	ND	30	42.8	30	2.44	30
C0096710	CGMN-F01-1IPF01-0-050812	ND	50	ND	30	2.98	30	ND	30
C0096710 Rep	CGMN-F01-1IPF01-0-050812*	ND	50	ND	30	2.98	30	ND	30
C0096711	CGMN-F01-1IPF02-0-050812	ND	40	ND	30	2.43	30	ND	30
C0096711 Rep	CGMN-F01-1IPF02-0-050812*	ND	40	ND	30	2.24	30	ND	30
C0096712	CGMN-F01-1IPF03-0-050812	ND	40	ND	30	4.04	30	ND	30
C0096712 Rep	CGMN-F01-1IPF03-0-050812*	ND	40	ND	30	4.00	30	ND	30
C0096713	CGMN-F01-1IPF04-0-050812	ND	50	ND	30	8.72	30	ND	30
C0096713 Rep	CGMN-F01-1IPF04-0-050812*	ND	50	ND	30	9.44	30	ND	30
C0096714	CGMN-F01-1IPF05-0-050812	ND	40	ND	30	11.8	30	ND	30
C0096714 Rep	CGMN-F01-1IPF05-0-050812*	ND	40	ND	30	11.8	30	ND	30
C0096715	CGMN-F01-3IPF01-0-050812	ND	40	ND	30	8.68	30	ND	30
C0096715 Rep	CGMN-F01-3IPF01-0-050812*	ND	40	ND	30	8.40	30	ND	30
C0096716	CGMN-F01-3IPF02-0-050812	ND	40	ND	30	94.4	30	ND	30
C0096716 Rep	CGMN-F01-3IPF02-0-050812*	ND	40	ND	30	96.0	30	ND	30
C0096717	CGMN-F01-3IPF03-0-050812	ND	30	ND	30	5.76	30	ND	30
C0096717 Rep	CGMN-F01-3IPF03-0-050812*	ND	30	ND	30	5.44	30	ND	30
C0096718	CGMN-F01-3IPF04-0-050812	ND	40	ND	30	5.92	30	ND	30
C0096718 Rep	CGMN-F01-3IPF04-0-050812*	ND	40	ND	30	6.44	30	ND	30
C0096719	CGMN-F01-3IPF05-0-050812	ND	30	ND	30	10.2	30	ND	30
C0096719 Rep	CGMN-F01-3IPF05-0-050812*	ND	30	ND	30	11.2	30	ND	30

*Laboratory Duplicate
^ 1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table V 'Summary of PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Table I. Summary of PFBS, PFHS, PFOS and PFOA in Fish Samples Continued

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)
C0096720	CGMN-F01-5IPF01-0-050812	ND	40	ND	30	70.8	30	0.604	30
C0096720 Rep	CGMN-F01-5IPF01-0-050812*	ND	40	ND	30	67.6	30	0.640	30
C0096721	CGMN-F01-5IPF02-0-050812	ND	40	ND	30	11.7	30	ND	30
C0096721 Rep	CGMN-F01-5IPF02-0-050812*	ND	40	ND	30	11.6	30	ND	30
C0096722	CGMN-F01-5IPF03-0-050812	ND	40	ND	30	2.61	30	1.16	30
C0096722 Rep	CGMN-F01-5IPF03-0-050812*	ND	40	ND	30	3.11	30	ND	30
C0096723	CGMN-F01-5IPF04-0-050812	ND	40	ND	30	42.8	30	1.80	30
C0096723 Rep	CGMN-F01-5IPF04-0-050812*	ND	40	ND	30	41.2	30	1.62	30
C0096724	CGMN-F01-5IPF05-0-050812	ND	40	ND	30	8.28	30	1.20	30
C0096724 Rep	CGMN-F01-5IPF05-0-050812*	ND	40	ND	30	7.20	30	1.47	30
C0096725	CGMN-F01-1LMW01-0-050812	4.04	30	ND	30	48.8	30	1.23	30
C0096725 Rep	CGMN-F01-1LMW01-0-050812*	3.21	30	ND	30	44.8	30	1.81	30
C0096726	CGMN-F01-1LMW02-0-050812	2.46	30	ND	30	33.7	30	1.04	30
C0096726 Re	CGMN-F01-1LMW02-0-050812*	2.21	30	ND	30	33.2	30	1.05	30
C0096727	CGMN-F01-1LMW03-0-050812	2.20	30	ND	30	72.4	30	0.824	40
C0096727 Rep	CGMN-F01-1LMW03-0-050812*	2.46	30	ND	30	78.4	30	1.24	40
C0096728	CGMN-F01-1LMW04-0-050812	1.12	30	ND	30	34.4	30	1.26	30
C0096728 Rep	CGMN-F01-1LMW04-0-050812*	0.864	30	ND	30	34.8	30	1.37	30
C0096729	CGMN-F01-1LMW05-0-050812	ND	30	ND	30	34.2	30	0.964	30
C0096729 Rep	CGMN-F01-1LMW05-0-050812*	0.500	30	ND	30	34.8	30	1.18	30
C0096730	CGMN-F01-3LMW01-0-050812	NR	NR	4.60	30	9320	50	38.7	30
C0096730 Rep	CGMN-F01-3LMW01-0-050812*	NR	NR	3.93	30	8680	50	37.0	30
C0096731	CGMN-F01-3LMW02-0-050812	NR	NR	1.98	30	369	50	8.12	40
C0096731 Rep	CGMN-F01-3LMW02-0-050812*	NR	NR	1.82	30	299	50	8.00	40
C0096732	CGMN-F01-3LMW03-0-050812	NR	NR	ND	30	126	30	1.48	30
C0096732 Rep	CGMN-F01-3LMW03-0-050812*	NR	NR	ND	30	118	30	1.25	30
C0096733	CGMN-F01-3LMW04-0-050812	2.81	30	ND	30	53.2	30	1.16	30
C0096733 Rep	CGMN-F01-3LMW04-0-050812*	2.98	30	ND	30	57.6	30	1.18	30
C0096734	CGMN-F01-3LMW05-0-050812	2.22	30	ND	30	150	40	1.29	30
C0096734 Rep	CGMN-F01-3LMW05-0-050812*	2.12	30	ND	30	153	40	1.39	30
C0096735^	CGMN-F01-5LMW01-0-050812	ND	30	ND	30	396	30	NR	NR
C0096735 Rep^	CGMN-F01-5LMW01-0-050812*	ND	30	ND	30	338	30	NR	NR
C0096736^	CGMN-F01-5LMW02-0-050812	7.52	30	ND	30	386	30	NR	NR
C0096736 Rep^	CGMN-F01-5LMW02-0-050812*	4.46	30	ND	30	374	30	NR	NR
C0096737^	CGMN-F01-5LMW03-0-050812	ND	30	ND	30	620	30	NR	NR
C0096737 Rep^	CGMN-F01-5LMW03-0-050812*	ND	30	ND	30	638	30	NR	NR
C0096738^	CGMN-F01-5LMW04-0-050812	20.6	50	ND	30	606	40	NR	NR
C0096738 Rep^	CGMN-F01-5LMW04-0-050812*	27.4	50	ND	30	518	40	NR	NR
C0096739^	CGMN-F01-5LMW05-0-050812	ND	30	ND	30	388	30	NR	NR
C0096739 Rep^	CGMN-F01-5LMW05-0-050812*	ND	30	ND	30	392	30	NR	NR
C0096740	CGMN-F01-1MDF01-0-050812	ND	30	ND	30	168	30	0.916	30
C0096740 Rep	CGMN-F01-1MDF01-0-050812*	ND	30	ND	30	188	30	0.980	30
C0096741	CGMN-F01-1MDF02-0-050812	ND	30	ND	30	96.8	40	1.04	30
C0096741 Rep	CGMN-F01-1MDF02-0-050812*	ND	30	ND	30	80.8	40	0.904	30
C0096742	CGMN-F01-1MDF03-0-050812	ND	30	ND	30	20.2	30	0.856	30
C0096742 Rep	CGMN-F01-1MDF03-0-050812*	ND	30	ND	30	17.6	30	0.856	30
C0096744	CGMN-F01-1MDF04-0-050812	ND	30	ND	30	51.2	30	0.836	30
C0096744 Rep	CGMN-F01-1MDF04-0-050812*	ND	30	ND	30	55.2	30	0.756	30
C0096747	CGMN-F01-1MDF05-0-050812	ND	30	ND	30	46.0	30	0.904	30
C0096747 Rep	CGMN-F01-1MDF05-0-050812*	ND	30	ND	30	44.0	30	0.904	30

*Laboratory Duplicate
^ 1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table V 'Summary of PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

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Table I. Summary of PFBS, PFHS, PFOS and PFOA in Fish Samples Continued

		C4 Sulfonate PFBS		C6 Sulfonate PFHS		C8 Sulfonate PFOS		C8 Acid PFOA	
Exygen ID	Client Sample ID	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)
C0096750^	CGMN-F01-1LMF01-0-050812	ND	30	ND	30	32.4	30	NR	NR
C0096750 Rep^	CGMN-F01-1LMF01-0-050812*	ND	30	ND	30	32.2	30	NR	NR
C0096753^	CGMN-F01-1LMF02-0-050812	ND	40	ND	30	30.2	30	NR	NR
C0096753 Rep^	CGMN-F01-1LMF02-0-050812*	ND	40	ND	30	30.4	30	NR	NR
C0096755^	CGMN-F01-3MDF01-0-050812	ND	30	ND	30	548	30	NR	NR
C0096755 Rep^	CGMN-F01-3MDF01-0-050812*	ND	30	ND	30	630	30	NR	NR
C0096758^	CGMN-F01-3MDF02-0-050812	ND	30	ND	30	110	30	NR	NR
C0096758 Rep^	CGMN-F01-3MDF02-0-050812*	ND	30	ND	30	110	30	NR	NR
C0096781^	CGMN-F01-3MDF03-0-050812	ND	30	ND	30	1360	30	NR	NR
C0096781 Rep^	CGMN-F01-3MDF03-0-050812*	ND	30	ND	30	1280	30	NR	NR
C0096782^	CGMN-F01-3LMF01-0-050812	ND	30	ND	30	798	30	NR	NR
C0096782 Rep^	CGMN-F01-3LMF01-0-050812*	ND	30	ND	30	620	30	NR	NR
C0096783^	CGMN-F01-3LMF02-0-050812	ND	30	ND	30	54.2	50	NR	NR
C0096783 Rep^	CGMN-F01-3LMF02-0-050812*	ND	30	ND	30	65.2	50	NR	NR
C0096784^	CGMN-F01-5MDF01-0-050812	3.42	30	ND	30	256	30	NR	NR
C0096784 Rep^	CGMN-F01-5MDF01-0-050812*	3.24	30	ND	30	324	30	NR	NR
C0096785^	CGMN-F01-5MDF02-0-050812	ND	30	ND	30	5160	50	NR	NR
C0096785 Rep^	CGMN-F01-5MDF02-0-050812*	ND	30	ND	30	5140	50	NR	NR
C0096786^	CGMN-F01-5MDF03-0-050812	ND	30	ND	30	892	50	NR	NR
C0096786 Rep^	CGMN-F01-5MDF03-0-050812*	ND	30	ND	30	876	50	NR	NR
C0096787^	CGMN-F01-5LMF01-0-050812	ND	30	ND	30	334	30	NR	NR
C0096787 Rep^	CGMN-F01-5LMF01-0-050812*	ND	30	ND	30	328	30	NR	NR
C0096788^	CGMN-F01-5LMF02-0-050812	ND	30	ND	30	348	30	NR	NR
C0096788 Rep^	CGMN-F01-5LMF02-0-050812*	ND	30	ND	30	312	30	NR	NR

*Laboratory Duplicate
^ 1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table V 'Summary of PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found in Sample (ng/g)	C4 Sulfonate PFBS Amount Recovered (ng/g)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	C6 Sulfonate PFHS Amt Found in Sample (ng/g)	C6 Sulfonate PFHS Amount Recovered (ng/g)	C6 Sulfonate PFHS Recovery (%)
CGMN-F01-1IPW01-0-050812 (C0096695 Spk C, 10 ng/g Lab Spike)	10	0.696	7.48	68	10	ND	10.5	105
CGMN-F01-1IPW01-0-050812 (C0096695 Spk D, 100 ng/g Lab Spike)	100	0.696	63.2	63	100	ND	97.2	97
CGMN-F01-1IPW02-0-050812 (C0096696 Spk E, 10 ng/g Lab Spike)	10	0.620	8.24	76	10	ND	11.0	110
CGMN-F01-1IPW02-0-050812 (C0096696 Spk F, 100 ng/g Lab Spike)	100	0.620	67.2	67	100	ND	108	108
CGMN-F01-1IPW03-0-050812 (C0096697 Spk G, 10 ng/g Lab Spike)	10	ND	7.76	78	10	ND	10.5	105
CGMN-F01-1IPW03-0-050812 (C0096697 Spk H, 100 ng/g Lab Spike)	100	ND	62.0	62	100	ND	98.4	98
CGMN-F01-1IPW04-0-050812 (C0096698 Spk I, 10 ng/g Lab Spike)	10	ND	6.64	66	10	ND	9.28	93
CGMN-F01-1IPW04-0-050812 (C0096698 Spk J, 100 ng/g Lab Spike)	100	ND	60.6	61	100	ND	94.0	94
CGMN-F01-1IPW05-0-050812 (C0096699 Spk K, 10 ng/g Lab Spike)	10	ND	7.44	74	10	ND	10.8	108
CGMN-F01-1IPW05-0-050812 (C0096699 Spk L, 100 ng/g Lab Spike)	100	ND	64.4	64	100	ND	98.0	98
CGMN-F01-3IPW01-0-050812 (C0096700 Spk C, 10 ng/g Lab Spike)	10	ND	7.72	77	10	2.34	12.4	101
CGMN-F01-3IPW01-0-050812 (C0096700 Spk D, 100 ng/g Lab Spike)	100	ND	62.8	63	100	2.34	96.4	94
CGMN-F01-3IPW02-0-050812 (C0096701 Spk E, 10 ng/g Lab Spike)	10	ND	8.24	82	10	ND	10.5	105
CGMN-F01-3IPW02-0-050812 (C0096701 Spk F, 100 ng/g Lab Spike)	100	ND	66.8	67	100	ND	109	109
CGMN-F01-3IPW03-0-050812 (C0096702 Spk G, 10 ng/g Lab Spike)	10	ND	8.04	80	10	ND	11.1	111
CGMN-F01-3IPW03-0-050812 (C0096702 Spk H, 100 ng/g Lab Spike)	100	ND	58.0	58	100	ND	104	104
CGMN-F01-3IPW04-0-050812 (C0096703 Spk I, 10 ng/g Lab Spike)	10	ND	8.48	85	10	ND	10.9	109
CGMN-F01-3IPW04-0-050812 (C0096703 Spk J, 100 ng/g Lab Spike)	100	ND	66.0	66	100	ND	94.4	94
CGMN-F01-3IPW05-0-050812 (C0096704 Spk K, 10 ng/g Lab Spike)	10	ND	8.80	88	10	ND	10.8	108
CGMN-F01-3IPW05-0-050812 (C0096704 Spk L, 100 ng/g Lab Spike)	100	ND	64.0	64	100	ND	108	108

[A] 1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-5IPW01-0-050812 (C0096705 Spk C, 10 ng/g Lab Spike)	10	ND	6.52	65	10	ND	11.2	112
CGMN-F01-5IPW01-0-050812 (C0096705 Spk D, 100 ng/g Lab Spike)	100	ND	62.4	62	100	ND	90.0	90
CGMN-F01-5IPW02-0-050812 (C0096706 Spk E, 10 ng/g Lab Spike)	10	ND	6.36	64	10	0.884	12.0	111
CGMN-F01-5IPW02-0-050812 (C0096706 Spk F, 100 ng/g Lab Spike)	100	ND	74.4	74	100	0.884	96.0	95
CGMN-F01-5IPW03-0-050812 (C0096707 Spk G, 10 ng/g Lab Spike)	10	ND	6.64	66	10	1.06	11.9	108
CGMN-F01-5IPW03-0-050812 (C0096707 Spk H, 100 ng/g Lab Spike)	100	ND	61.2	61	100	1.06	92.0	91
CGMN-F01-5IPW04-0-050812 (C0096708 Spk I, 10 ng/g Lab Spike)	10	ND	5.96	60	10	ND	10.0	100
CGMN-F01-5IPW04-0-050812 (C0096708 Spk J, 100 ng/g Lab Spike)	100	ND	64.0	64	100	ND	88.8	89
CGMN-F01-5IPW05-0-050812 (C0096709 Spk K, 10 ng/g Lab Spike)	10	ND	5.72	57	10	ND	10.2	102
CGMN-F01-5IPW05-0-050812 (C0096709 Spk L, 100 ng/g Lab Spike)	100	ND	63.2	63	100	ND	88.4	88
CGMN-F01-1IPF01-0-050812 (C0096710 Spk C, 10 ng/g Lab Spike)	10	ND	5.92	59	10	ND	9.48	95
CGMN-F01-1IPF01-0-050812 (C0096710 Spk D, 100 ng/g Lab Spike)	100	ND	70.8	71	100	ND	94.0	94
CGMN-F01-1IPF02-0-050812 (C0096711 Spk E, 10 ng/g Lab Spike)	10	ND	6.04	60	10	ND	10.3	103
CGMN-F01-1IPF02-0-050812 (C0096711 Spk F, 100 ng/g Lab Spike)	100	ND	68.8	69	100	ND	91.6	92
CGMN-F01-1IPF03-0-050812 (C0096712 Spk G, 10 ng/g Lab Spike)	10	ND	5.96	60	10	ND	9.80	98
CGMN-F01-1IPF03-0-050812 (C0096712 Spk H, 100 ng/g Lab Spike)	100	ND	65.6	66	100	ND	87.6	88
CGMN-F01-1IPF04-0-050812 (C0096713 Spk I, 10 ng/g Lab Spike)	10	ND	5.44	54	10	ND	9.84	98
CGMN-F01-1IPF04-0-050812 (C0096713 Spk J, 100 ng/g Lab Spike)	100	ND	69.2	69	100	ND	90.0	90
CGMN-F01-1IPF05-0-050812 (C0096714 Spk K, 10 ng/g Lab Spike)	10	ND	6.04	60	10	ND	11.1	111
CGMN-F01-1IPF05-0-050812 (C0096714 Spk L, 100 ng/g Lab Spike)	100	ND	68.4	68	100	ND	84.4	84

^ 1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found in Sample (ng/g)	C4 Sulfonate PFBS Amount Recovered (ng/g)	C4 Sulfonate PFBS Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	C6 Sulfonate PFHS Amt Found in Sample (ng/g)	C6 Sulfonate PFHS Amount Recovered (ng/g)	C6 Sulfonate PFHS Recovery (%)
CGMN-F01-3IPF01-0-050812 (C0096715 Spk C, 10 ng/g Lab Spike)	10	ND	6.40	64	10	ND	10.8	108
CGMN-F01-3IPF01-0-050812 (C0096715 Spk D, 100 ng/g Lab Spike)	100	ND	75.2	75	100	ND	93.6	94
CGMN-F01-3IPF02-0-050812 (C0096716 Spk E, 10 ng/g Lab Spike)	10	ND	6.08	61	10	ND	11.2	112
CGMN-F01-3IPF02-0-050812 (C0096716 Spk F, 100 ng/g Lab Spike)	100	ND	69.6	70	100	ND	86.0	86
CGMN-F01-3IPF03-0-050812 (C0096717 Spk G, 10 ng/g Lab Spike)	10	ND	7.00	70	10	ND	10.6	106
CGMN-F01-3IPF03-0-050812 (C0096717 Spk H, 100 ng/g Lab Spike)	100	ND	78.4	78	100	ND	94.4	94
CGMN-F01-3IPF04-0-050812 (C0096718 Spk I, 10 ng/g Lab Spike)	10	ND	6.48	65	10	ND	10.8	108
CGMN-F01-3IPF04-0-050812 (C0096718 Spk J, 100 ng/g Lab Spike)	100	ND	68.4	68	100	ND	86.8	87
CGMN-F01-3IPF05-0-050812 (C0096719 Spk K, 10 ng/g Lab Spike)	10	ND	7.08	71	10	ND	11.0	110
CGMN-F01-3IPF05-0-050812 (C0096719 Spk L, 100 ng/g Lab Spike)	100	ND	72.8	73	100	ND	92.8	93
CGMN-F01-5IPF01-0-050812 (C0096720 Spk C, 10 ng/g Lab Spike)	10	ND	6.20	62	10	ND	10.6	106
CGMN-F01-5IPF01-0-050812 (C0096720 Spk D, 100 ng/g Lab Spike)	100	ND	59.6	60	100	ND	88.6	89
CGMN-F01-5IPF02-0-050812 (C0096721 Spk E, 10 ng/g Lab Spike)	10	ND	6.08	61	10	ND	10.2	102
CGMN-F01-5IPF02-0-050812 (C0096721 Spk F, 100 ng/g Lab Spike)	100	ND	60.0	60	100	ND	88.0	88
CGMN-F01-5IPF03-0-050812 (C0096722 Spk G, 10 ng/g Lab Spike)	10	ND	6.64	66	10	ND	10.6	106
CGMN-F01-5IPF03-0-050812 (C0096722 Spk H, 100 ng/g Lab Spike)	100	ND	56.8	57	100	ND	92.4	92
CGMN-F01-5IPF04-0-050812 (C0096723 Spk I, 10 ng/g Lab Spike)	10	ND	6.20	62	10	ND	10.5	105
CGMN-F01-5IPF04-0-050812 (C0096723 Spk J, 100 ng/g Lab Spike)	100	ND	55.6	56	100	ND	94.4	94
CGMN-F01-5IPF05-0-050812 (C0096724 Spk K, 10 ng/g Lab Spike)	10	ND	6.36	64	10	ND	10.3	103
CGMN-F01-5IPF05-0-050812 (C0096724 Spk L, 100 ng/g Lab Spike)	100	ND	58.0	58	100	ND	89.6	90

* 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-1LMW01-0-050812 (C0096725 Spk C, 10 ng/g Lab Spike)	10	4.04	15.0	110	10	ND	9.52	95
CGMN-F01-1LMW01-0-050812 (C0096725 Spk D, 100 ng/g Lab Spike)	100	4.04	87.2	83	100	ND	106	106
CGMN-F01-1LMW02-0-050812 (C0096726 Spk E, 10 ng/g Lab Spike)	10	2.48	10.0	75	10	ND	9.68	97
CGMN-F01-1LMW02-0-050812 (C0096726 Spk F, 100 ng/g Lab Spike)	100	2.48	78.4	76	100	ND	110	110
CGMN-F01-1LMW03-0-050812 (C0096727 Spk G, 10 ng/g Lab Spike)	10	2.20	10.2	80	10	ND	10.0	100
CGMN-F01-1LMW03-0-050812 (C0096727 Spk H, 100 ng/g Lab Spike)	100	2.20	86.8	85	100	ND	106	106
CGMN-F01-1LMW04-0-050812 (C0096728 Spk I, 10 ng/g Lab Spike)	10	1.12	8.44	73	10	ND	9.88	99
CGMN-F01-1LMW04-0-050812 (C0096728 Spk J, 100 ng/g Lab Spike)	100	1.12	86.0	85	100	ND	118	118
CGMN-F01-1LMW05-0-050812 (C0096729 Spk K, 10 ng/g Lab Spike)	10	ND	7.44	74	10	ND	9.24	92
CGMN-F01-1LMW05-0-050812 (C0096729 Spk L, 100 ng/g Lab Spike)	100	ND	88.4	88	100	ND	110	110
CGMN-F01-3LMW01-0-050812 (C0096730 Spk C, 10 ng/g Lab Spike)	10	NR	NR	NR	10	4.80	13.2	86
CGMN-F01-3LMW01-0-050812 (C0096730 Spk D, 100 ng/g Lab Spike)	100	NR	NR	NR	100	4.80	116	111
CGMN-F01-3LMW02-0-060812 (C0096731 Spk E, 10 ng/g Lab Spike)	10	NR	NR	NR	10	1.96	10.5	85
CGMN-F01-3LMW02-0-050812 (C0096731 Spk F, 100 ng/g Lab Spike)	100	NR	NR	NR	100	1.96	105	103
CGMN-F01-3LMW03-0-050812 (C0096732 Spk G, 10 ng/g Lab Spike)	10	NR	NR	NR	10	ND	9.48	95
CGMN-F01-3LMW03-0-050812 (C0096732 Spk H, 100 ng/g Lab Spike)	100	NR	NR	NR	100	ND	105	105
CGMN-F01-3LMW04-0-050812 (C0096733 Spk I, 10 ng/g Lab Spike)	10	2.81	11.1	83	10	ND	9.80	98
CGMN-F01-3LMW04-0-050812 (C0096733 Spk J, 100 ng/g Lab Spike)	100	2.81	88.4	86	100	ND	107	107
CGMN-F01-3LMW05-0-050812 (C0096734 Spk K, 10 ng/g Lab Spike)	10	2.22	9.84	76	10	ND	10.0	100
CGMN-F01-3LMW05-0-050812 (C0096734 Spk L, 100 ng/g Lab Spike)	100	2.22	86.0	84	100	ND	105	105

[a] 1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-5LMW01-0-050812^ (C0096735 Spk C, 50 ng/g Lab Spike)	50	ND	55.0	110	50	ND	54.0	108
CGMN-F01-5LMW01-0-050812^ (C0096735 Spk D, 500 ng/g Lab Spike)	500	ND	520	104	500	ND	530	106
CGMN-F01-5LMW02-0-050812^ (C0096736 Spk E, 50 ng/g Lab Spike)	50	7.52	60.0	105	50	ND	56.4	113
CGMN-F01-5LMW02-0-050812^ (C0096736 Spk F, 500 ng/g Lab Spike)	500	7.52	506	100	500	ND	504	101
CGMN-F01-5LMW03-0-050812^ (C0096737 Spk G, 50 ng/g Lab Spike)	50	ND	51.0	102	50	ND	52.6	105
CGMN-F01-5LMW03-0-050812^ (C0096737 Spk H, 500 ng/g Lab Spike)	500	ND	460	92	500	ND	476	95
CGMN-F01-5LMW04-0-050812^ (C0096738 Spk I, 50 ng/g Lab Spike)	50	20.8	44.8	48	50	ND	55.6	111
CGMN-F01-5LMW04-0-050812^ (C0096738 Spk J, 500 ng/g Lab Spike)	500	20.8	368	69	500	ND	476	95
CGMN-F01-5LMW05-0-050812^ (C0096739 Spk K, 50 ng/g Lab Spike)	50	ND	52.6	105	50	ND	50.4	101
CGMN-F01-5LMW05-0-050812^ (C0096739 Spk L, 500 ng/g Lab Spike)	500	ND	490	98	500	ND	520	104
CGMN-F01-1MDF01-0-050812 (C0096740 Spk C, 10 ng/g Lab Spike)	10	ND	9.48	95	10	ND	10.0	100
CGMN-F01-1MDF01-0-050812 (C0096740 Spk D, 100 ng/g Lab Spike)	100	ND	93.2	93	100	ND	94.4	94
CGMN-F01-1MDF02-0-050812 (C0096741 Spk E, 10 ng/g Lab Spike)	10	ND	9.64	96	10	ND	9.40	94
CGMN-F01-1MDF02-0-050812 (C0096741 Spk F, 100 ng/g Lab Spike)	100	ND	90.4	90	100	ND	92.4	92
CGMN-F01-1MDF03-0-050812 (C0096742 Spk G, 10 ng/g Lab Spike)	10	ND	9.86	99	10	ND	9.44	94
CGMN-F01-1MDF03-0-050812 (C0096742 Spk H, 100 ng/g Lab Spike)	100	ND	94.0	94	100	ND	93.6	94
CGMN-F01-1MDF04-0-050812 (C0096744 Spk I, 10 ng/g Lab Spike)	10	ND	9.52	95	10	ND	9.52	95
CGMN-F01-1MDF04-0-050812 (C0096744 Spk J, 100 ng/g Lab Spike)	100	ND	90.8	91	100	ND	92.8	93
CGMN-F01-1MDF05-0-050812 (C0096747 Spk K, 10 ng/g Lab Spike)	10	ND	9.84	98	10	ND	9.88	99
CGMN-F01-1MDF05-0-050812 (C0096747 Spk L, 100 ng/g Lab Spike)	100	ND	88.4	88	100	ND	85.6	86

^ 1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-1LMF01-0-050812^ (C0096750 Spk C, 50 ng/g Lab Spike)	50	ND	35.8	72	50	ND	47.6	95
CGMN-F01-1LMF01-0-050812^ (C0096750 Spk D, 500 ng/g Lab Spike)	500	ND	364	73	500	ND	498	100
CGMN-F01-1LMF02-0-050812^ (C0096753 Spk E, 50 ng/g Lab Spike)	50	ND	34.4	69	50	ND	48.8	98
CGMN-F01-1LMF02-0-050812^ (C0096753 Spk F, 500 ng/g Lab Spike)	500	ND	356	71	500	ND	472	94
CGMN-F01-3MDF01-0-050812^ (C0096755 Spk G, 50 ng/g Lab Spike)	50	ND	38.0	76	50	ND	52.2	104
CGMN-F01-3MDF01-0-050812^ (C0096755 Spk H, 500 ng/g Lab Spike)	500	ND	352	70	500	ND	464	93
CGMN-F01-3MDF02-0-050812^ (C0096758 Spk I, 50 ng/g Lab Spike)	50	ND	38.2	76	50	ND	49.4	99
CGMN-F01-3MDF02-0-050812^ (C0096758 Spk J, 500 ng/g Lab Spike)	500	ND	368	74	500	ND	480	96
CGMN-F01-3MDF03-0-050812^ (C0096781 Spk K, 50 ng/g Lab Spike)	50	ND	37.6	75	50	ND	50.2	100
CGMN-F01-3MDF03-0-050812^ (C0096781 Spk L, 500 ng/g Lab Spike)	500	ND	368	74	500	ND	492	98
CGMN-F01-3LMF01-0-050812^ (C0096782 Spk C, 50 ng/g Lab Spike)	50	ND	51.2	102	50	ND	51.6	103
CGMN-F01-3LMF01-0-050812^ (C0096782 Spk D, 500 ng/g Lab Spike)	500	ND	490	98	500	ND	478	96
CGMN-F01-3LMF02-0-050812^ (C0096783 Spk E, 50 ng/g Lab Spike)	50	ND	49.0	98	50	ND	47.2	94
CGMN-F01-3LMF02-0-050812^ (C0096783 Spk F, 500 ng/g Lab Spike)	500	ND	484	97	500	ND	448	90
CGMN-F01-5MDF01-0-050812^ (C0096784 Spk G, 50 ng/g Lab Spike)	50	3.40	53.0	99	50	ND	47.4	95
CGMN-F01-5MDF01-0-050812^ (C0096784 Spk H, 500 ng/g Lab Spike)	500	3.40	524	104	500	ND	458	92
CGMN-F01-5MDF02-0-050812^ (C0096785 Spk I, 50 ng/g Lab Spike)	50	ND	49.4	99	50	ND	49.2	98
CGMN-F01-5MDF02-0-050812^ (C0096785 Spk J, 500 ng/g Lab Spike)	500	ND	432	86	500	ND	402	80
CGMN-F01-5MDF03-0-050812^ (C0096786 Spk C, 50 ng/g Lab Spike)	50	ND	36.0	72	50	ND	43.0	86
CGMN-F01-5MDF03-0-050812^ (C0096786 Spk D, 500 ng/g Lab Spike)	500	ND	376	75	500	ND	492	98

^ 1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table II. Matrix Spike Recovery of PFBS and PFHS in Fish Samples Continued

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C6 Sulfonate PFHS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-5LMF01-0-050812^ (C0096787 Spk E, 50 ng/g Lab Spike)	50	ND	34.8	70	50	ND	44.0	88
CGMN-F01-5LMF01-0-050812^ (C0096787 Spk F, 500 ng/g Lab Spike)	500	ND	338	68	500	ND	442	88
CGMN-F01-5LMF02-0-050812^ (C0096788 Spk G, 50 ng/g Lab Spike)	50	ND	36.4	73	50	ND	46.4	93
CGMN-F01-5LMF02-0-050812^ (C0096788 Spk H, 500 ng/g Lab Spike)	500	ND	378	76	500	ND	470	94
			Average:	76			Average:	90
			Standard Deviation:	14			Standard Deviation:	8

^ 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	C8 Sulfonate PFOS Amt Found In Sample (ng/g)	C8 Sulfonate PFOS Amount Recovered (ng/g)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found In Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	C8 Acid PFOA Recovery (%)
CGMN-F01-1IPW01-0-050812 (C0096695 Spk C, 10 ng/g Lab Spike)	10	17.0	34.5	175	10	0.808	8.84	78
CGMN-F01-1IPW01-0-050812 (C0096695 Spk D, 100 ng/g Lab Spike)	100	17.0	128	111	100	0.808	101	100
CGMN-F01-1IPW02-0-050812 (C0096696 Spk E, 10 ng/g Lab Spike)	10	32.2	43.6	*	10	0.932	8.56	76
CGMN-F01-1IPW02-0-050812 (C0096696 Spk F, 100 ng/g Lab Spike)	100	32.2	140	108	100	0.932	101	100
CGMN-F01-1IPW03-0-050812 (C0096697 Spk G, 10 ng/g Lab Spike)	10	14.3	28.3	140	10	0.900	8.76	79
CGMN-F01-1IPW03-0-050812 (C0096697 Spk H, 100 ng/g Lab Spike)	100	14.3	124	110	100	0.900	104	103
CGMN-F01-1IPW04-0-050812 (C0096698 Spk I, 10 ng/g Lab Spike)	10	14.9	24.7	98	10	1.07	8.08	70
CGMN-F01-1IPW04-0-050812 (C0096698 Spk J, 100 ng/g Lab Spike)	100	14.9	115	100	100	1.07	97.2	96
CGMN-F01-1IPW05-0-050812 (C0096699 Spk K, 10 ng/g Lab Spike)	10	10.5	18.7	82	10	0.712	7.52	68
CGMN-F01-1IPW05-0-050812 (C0096699 Spk L, 100 ng/g Lab Spike)	100	10.5	116	106	100	0.712	102	101
CGMN-F01-3IPW01-0-050812 (C0096700 Spk C, 10 ng/g Lab Spike)	10	552	500	*	10	1.54	10.0	85
CGMN-F01-3IPW01-0-050812 (C0096700 Spk D, 100 ng/g Lab Spike)	100	552	612	*	100	1.54	115	113
CGMN-F01-3IPW02-0-050812 (C0096701 Spk E, 10 ng/g Lab Spike)	10	45.2	53.6	*	10	0.836	6.80	60
CGMN-F01-3IPW02-0-050812 (C0096701 Spk F, 100 ng/g Lab Spike)	100	45.2	142	97	100	0.836	98.8	98
CGMN-F01-3IPW03-0-050812 (C0096702 Spk G, 10 ng/g Lab Spike)	10	17.0	36.7	197	10	1.14	9.44	83
CGMN-F01-3IPW03-0-050812 (C0096702 Spk H, 100 ng/g Lab Spike)	100	17.0	126	109	100	1.14	105	104
CGMN-F01-3IPW04-0-050812 (C0096703 Spk I, 10 ng/g Lab Spike)	10	31.6	45.6	*	10	1.37	10.5	91
CGMN-F01-3IPW04-0-050812 (C0096703 Spk J, 100 ng/g Lab Spike)	100	31.6	129	97	100	1.37	98.0	97
CGMN-F01-3IPW05-0-050812 (C0096704 Spk K, 10 ng/g Lab Spike)	10	11.8	20.5	87	10	0.732	7.20	65
CGMN-F01-3IPW05-0-050812 (C0096704 Spk L, 100 ng/g Lab Spike)	100	11.8	120	108	100	0.732	104	103

^ 1.0 g of sample used for extraction instead of 5.0 g.

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-5IPW01-0-050812 (C0096705 Spk C, 10 ng/g Lab Spike)	10	54.4	78.0	*	10	1.26	9.44	82
CGMN-F01-5IPW01-0-050812 (C0096705 Spk D, 100 ng/g Lab Spike)	100	54.4	140	86	100	1.26	106	105
CGMN-F01-5IPW02-0-050812 (C0096706 Spk E, 10 ng/g Lab Spike)	10	124	143	*	10	1.93	11.0	91
CGMN-F01-5IPW02-0-050812 (C0096706 Spk F, 100 ng/g Lab Spike)	100	124	225	101	100	1.93	118	116
CGMN-F01-5IPW03-0-050812 (C0096707 Spk G, 10 ng/g Lab Spike)	10	313	384	*	10	2.56	10.7	81
CGMN-F01-5IPW03-0-050812 (C0096707 Spk H, 100 ng/g Lab Spike)	100	313	390	*	100	2.56	99.6	97
CGMN-F01-5IPW04-0-050812 (C0096708 Spk I, 10 ng/g Lab Spike)	10	125	131	*	10	2.55	11.8	93
CGMN-F01-5IPW04-0-050812 (C0096708 Spk J, 100 ng/g Lab Spike)	100	125	218	93	100	2.55	92.8	90
CGMN-F01-5IPW05-0-050812 (C0096709 Spk K, 10 ng/g Lab Spike)	10	36.9	50.6	*	10	2.15	12.7	106
CGMN-F01-5IPW05-0-050812 (C0096709 Spk L, 100 ng/g Lab Spike)	100	36.9	125	88	100	2.15	96.8	95
CGMN-F01-1IPF01-0-050812 (C0096710 Spk C, 10 ng/g Lab Spike)	10	2.96	11.8	89	10	ND	10.8	108
CGMN-F01-1IPF01-0-050812 (C0096710 Spk D, 100 ng/g Lab Spike)	100	2.96	102	99	100	ND	96.0	96
CGMN-F01-1IPF02-0-050812 (C0096711 Spk E, 10 ng/g Lab Spike)	10	2.43	11.5	91	10	ND	10.6	106
CGMN-F01-1IPF02-0-050812 (C0096711 Spk F, 100 ng/g Lab Spike)	100	2.43	98.0	96	100	ND	98.4	98
CGMN-F01-1IPF03-0-050812 (C0096712 Spk G, 10 ng/g Lab Spike)	10	4.04	13.3	93	10	ND	11.1	111
CGMN-F01-1IPF03-0-050812 (C0096712 Spk H, 100 ng/g Lab Spike)	100	4.04	97.6	94	100	ND	96.8	97
CGMN-F01-1IPF04-0-050812 (C0096713 Spk I, 10 ng/g Lab Spike)	10	8.72	17.1	84	10	ND	10.8	108
CGMN-F01-1IPF04-0-050812 (C0096713 Spk J, 100 ng/g Lab Spike)	100	8.72	104	95	100	ND	95.2	95
CGMN-F01-1IPF05-0-050812 (C0096714 Spk K, 10 ng/g Lab Spike)	10	11.6	24.4	128	10	ND	11.6	116
CGMN-F01-1IPF05-0-050812 (C0096714 Spk L, 100 ng/g Lab Spike)	100	11.6	102	90	100	ND	89.2	89

^ 1.0 g of sample used for extraction instead of 5.0 g.
*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found in Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-3IPF01-0-050812 (C0004715 Spk C, 10 ng/g Lab Spike)	10	8.68	18.0	93	10	ND	10.3	103
CGMN-F01-3IPF01-0-050812 (C0004715 Spk D, 100 ng/g Lab Spike)	100	8.66	112	103	100	ND	91.2	91
CGMN-F01-3IPF02-0-050812 (C0004716 Spk E, 10 ng/g Lab Spike)	10	94.4	103.0	*	10	ND	11.4	114
CGMN-F01-3IPF02-0-050812 (C0004716 Spk F, 100 ng/g Lab Spike)	100	94.4	184	90	100	ND	95.2	95
CGMN-F01-3IPF03-0-050812 (C0004717 Spk G, 10 ng/g Lab Spike)	10	5.76	15.4	96	10	ND	12.0	120
CGMN-F01-3IPF03-0-050812 (C0004717 Spk H, 100 ng/g Lab Spike)	100	5.76	108	102	100	ND	96.8	97
CGMN-F01-3IPF04-0-050812 (C0004718 Spk I, 10 ng/g Lab Spike)	10	5.92	14.4	85	10	ND	10.8	108
CGMN-F01-3IPF04-0-050812 (C0004718 Spk J, 100 ng/g Lab Spike)	100	5.92	98.4	92	100	ND	88.8	89
CGMN-F01-3IPF05-0-050812 (C0004719 Spk K, 10 ng/g Lab Spike)	10	10.2	19.7	95	10	ND	11.3	113
CGMN-F01-3IPF05-0-050812 (C0004719 Spk L, 100 ng/g Lab Spike)	100	10.2	108	98	100	ND	100	100
CGMN-F01-5IPF01-0-050812 (C0004720 Spk C, 10 ng/g Lab Spike)	10	70.8	85.6	*	10	0.604	10.9	103
CGMN-F01-5IPF01-0-050812 (C0004720 Spk D, 100 ng/g Lab Spike)	100	70.8	164	93	100	0.604	96.4	96
CGMN-F01-5IPF02-0-050812 (C0004721 Spk E, 10 ng/g Lab Spike)	10	11.7	23.2	115	10	ND	11.1	111
CGMN-F01-5IPF02-0-050812 (C0004721 Spk F, 100 ng/g Lab Spike)	100	11.7	110	98	100	ND	90.0	90
CGMN-F01-5IPF03-0-050812 (C0004722 Spk G, 10 ng/g Lab Spike)	10	2.81	11.7	91	10	1.18	10.4	93
CGMN-F01-5IPF03-0-050812 (C0004722 Spk H, 100 ng/g Lab Spike)	100	2.81	102	99	100	1.18	104	103
CGMN-F01-5IPF04-0-050812 (C0004723 Spk I, 10 ng/g Lab Spike)	10	42.8	52.8	*	10	1.80	12.4	106
CGMN-F01-5IPF04-0-050812 (C0004723 Spk J, 100 ng/g Lab Spike)	100	42.8	135	92	100	1.80	91.2	89
CGMN-F01-5IPF05-0-050812 (C0004724 Spk K, 10 ng/g Lab Spike)	10	8.28	15.9	76	10	1.20	10.7	95
CGMN-F01-5IPF05-0-050812 (C0004724 Spk L, 100 ng/g Lab Spike)	100	8.28	105	97	100	1.20	92.4	91

^ 1.0 g of sample used for extraction instead of 5.0 g.

*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated

NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.

ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	C8 Sulfonate PFOS Amt Found In Sample (ng/g)	C8 Sulfonate PFOS Amount Recovered (ng/g)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found In Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	C8 Acid PFOA Recovery (%)
CGMN-F01-1LMW01-0-050812 (C0096725 Spk C, 10 ng/g Lab Spike)	10	48.8	65.6	*	10	1.23	9.92	87
CGMN-F01-1LMW01-0-050812 (C0096725 Spk D, 100 ng/g Lab Spike)	100	48.8	139	90	100	1.23	120	119
CGMN-F01-1LMW02-0-050812 (C0096726 Spk E, 10 ng/g Lab Spike)	10	33.7	50.4	*	10	1.04	9.28	82
CGMN-F01-1LMW02-0-050812 (C0096726 Spk F, 100 ng/g Lab Spike)	100	33.7	133	99	100	1.04	115	114
CGMN-F01-1LMW03-0-050812 (C0096727 Spk G, 10 ng/g Lab Spike)	10	72.4	94.8	*	10	0.824	14.0	132
CGMN-F01-1LMW03-0-050812 (C0096727 Spk H, 100 ng/g Lab Spike)	100	72.4	169	97	100	0.824	116	115
CGMN-F01-1LMW04-0-050812 (C0096728 Spk I, 10 ng/g Lab Spike)	10	34.4	43.2	*	10	1.28	10.0	87
CGMN-F01-1LMW04-0-050812 (C0096728 Spk J, 100 ng/g Lab Spike)	100	34.4	140	106	100	1.28	129	127
CGMN-F01-1LMW05-0-050812 (C0096729 Spk K, 10 ng/g Lab Spike)	10	34.2	48.8	*	10	0.964	9.08	81
CGMN-F01-1LMW05-0-050812 (C0096729 Spk L, 100 ng/g Lab Spike)	100	34.2	128	94	100	0.964	135	134
CGMN-F01-3LMW01-0-050812^ (C0096730 Spk C, 10 ng/g Lab Spike)	10	9320	8640	*	50	194	242	*
CGMN-F01-3LMW01-0-050812^ (C0096730 Spk D, 100 ng/g Lab Spike)	100	9320	10400	*	500	194	658	93
CGMN-F01-3LMW02-0-050812 (C0096731 Spk E, 10 ng/g Lab Spike)	10	369	361	*	10	8.12	14.8	65
CGMN-F01-3LMW02-0-050812 (C0096731 Spk F, 100 ng/g Lab Spike)	100	369	436	*	100	8.12	130	122
CGMN-F01-3LMW03-0-050812 (C0096732 Spk G, 10 ng/g Lab Spike)	10	126	128	*	10	1.48	9.38	79
CGMN-F01-3LMW03-0-050812 (C0096732 Spk H, 100 ng/g Lab Spike)	100	126	247	121	100	1.48	115	114
CGMN-F01-3LMW04-0-050812 (C0096733 Spk I, 10 ng/g Lab Spike)	10	53.2	66.0	*	10	1.18	9.16	80
CGMN-F01-3LMW04-0-050812 (C0096733 Spk J, 100 ng/g Lab Spike)	100	53.2	150	97	100	1.18	121	120
CGMN-F01-3LMW05-0-050812 (C0096734 Spk K, 10 ng/g Lab Spike)	10	150	160	*	10	1.29	9.68	84
CGMN-F01-3LMW05-0-050812 (C0096734 Spk L, 100 ng/g Lab Spike)	100	150	283	133	100	1.29	116	115

^ 1.0 g of sample used for extraction instead of 5.0 g.
*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

	C8 Sulfonate PFOS				C8 Acid PFOA			
Sample Description	Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-5LMW01-0-050812^ (C0006735 Spk C, 50 ng/g Lab Spike)	50	396	378	*	50	NR	NR	NR
CGMN-F01-5LMW01-0-050812^ (C0006735 Spk D, 500 ng/g Lab Spike)	500	396	854	92	500	NR	NR	NR
CGMN-F01-5LMW02-0-050812^ (C0006736 Spk E, 50 ng/g Lab Spike)	50	388	412.0	*	50	NR	NR	NR
CGMN-F01-5LMW02-0-050812^ (C0006736 Spk F, 500 ng/g Lab Spike)	500	388	822	87	500	NR	NR	NR
CGMN-F01-5LMW03-0-050812^ (C0006737 Spk G, 50 ng/g Lab Spike)	50	620	730	*	50	NR	NR	NR
CGMN-F01-5LMW03-0-050812^ (C0006737 Spk H, 500 ng/g Lab Spike)	500	620	968	70	500	NR	NR	NR
CGMN-F01-5LMW04-0-050812^ (C0006738 Spk I, 50 ng/g Lab Spike)	50	606	676	*	50	NR	NR	NR
CGMN-F01-5LMW04-0-050812^ (C0006738 Spk J, 500 ng/g Lab Spike)	500	606	934	66	500	NR	NR	NR
CGMN-F01-5LMW05-0-050812^ (C0006739 Spk K, 50 ng/g Lab Spike)	50	388	482	*	50	NR	NR	NR
CGMN-F01-5LMW05-0-050812^ (C0006739 Spk L, 500 ng/g Lab Spike)	500	388	848	92	500	NR	NR	NR
CGMN-F01-1MDF01-0-050812 (C0006740 Spk C, 10 ng/g Lab Spike)	10	168	128	*	10	0.916	8.28	74
CGMN-F01-1MDF01-0-050812 (C0006740 Spk D, 100 ng/g Lab Spike)	100	168	240	72	100	0.916	87.2	86
CGMN-F01-1MDF02-0-050812 (C0006741 Spk E, 10 ng/g Lab Spike)	10	98.8	114	*	10	1.04	8.16	71
CGMN-F01-1MDF02-0-050812 (C0006741 Spk F, 100 ng/g Lab Spike)	100	98.8	162	63	100	1.04	80.0	79
CGMN-F01-1MDF03-0-050812 (C0006742 Spk G, 10 ng/g Lab Spike)	10	20.2	32.2	120	10	0.856	8.08	72
CGMN-F01-1MDF03-0-050812 (C0006742 Spk H, 100 ng/g Lab Spike)	100	20.2	118	98	100	0.856	86.0	85
CGMN-F01-1MDF04-0-050812 (C0006744 Spk I, 10 ng/g Lab Spike)	10	51.2	52.4	*	10	0.836	7.80	70
CGMN-F01-1MDF04-0-050812 (C0006744 Spk J, 100 ng/g Lab Spike)	100	51.2	136	85	100	0.836	85.2	84
CGMN-F01-1MDF05-0-050812 (C0006747 Spk K, 10 ng/g Lab Spike)	10	46.0	57.6	*	10	0.904	8.24	73
CGMN-F01-1MDF05-0-050812 (C0006747 Spk L, 100 ng/g Lab Spike)	100	46.0	121	75	100	0.904	74.8	74

^ 1.0 g of sample used for extraction instead of 5.0 g.
*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
NR = Not reported due to quality control result failures. See Table VI "Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples" for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	C8 Sulfonate PFOS Amt Found in Sample (ng/g)	C8 Sulfonate PFOS Amount Recovered (ng/g)	C8 Sulfonate PFOS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found in Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	C8 Acid PFOA Recovery (%)
CGMN-F01-1LMF01-0-050812^ (C0096750 Spk C, 50 ng/g Lab Spike)	50	32.4	74.2	84	50	NR	NR	NR
CGMN-F01-1LMF01-0-050812^ (C0096750 Spk D, 500 ng/g Lab Spike)	500	32.4	536	101	500	NR	NR	NR
CGMN-F01-1LMF02-0-050812^ (C0096753 Spk E, 50 ng/g Lab Spike)	50	30.2	81.6	103	50	NR	NR	NR
CGMN-F01-1LMF02-0-050812^ (C0096753 Spk F, 500 ng/g Lab Spike)	500	30.2	512	96	500	NR	NR	NR
CGMN-F01-3MDF01-0-050812^ (C0096755 Spk G, 50 ng/g Lab Spike)	50	548	570	*	50	NR	NR	NR
CGMN-F01-3MDF01-0-050812^ (C0096755 Spk H, 500 ng/g Lab Spike)	500	548	972	85	500	NR	NR	NR
CGMN-F01-3MDF02-0-050812^ (C0096758 Spk I, 50 ng/g Lab Spike)	50	110	172	124	50	NR	NR	NR
CGMN-F01-3MDF02-0-050812^ (C0096758 Spk J, 500 ng/g Lab Spike)	500	110	592	96	500	NR	NR	NR
CGMN-F01-3MDF03-0-050812^ (C0096761 Spk K, 50 ng/g Lab Spike)	50	1360	1260	*	50	NR	NR	NR
CGMN-F01-3MDF03-0-050812^ (C0096761 Spk L, 500 ng/g Lab Spike)	500	1360	1860	100	500	NR	NR	NR
CGMN-F01-3LMF01-0-050812^ (C0096782 Spk C, 50 ng/g Lab Spike)	50	798	754	*	50	NR	NR	NR
CGMN-F01-3LMF01-0-050812^ (C0096782 Spk D, 500 ng/g Lab Spike)	500	798	1290	98	500	NR	NR	NR
CGMN-F01-3LMF02-0-050812^ (C0096783 Spk E, 50 ng/g Lab Spike)	50	54.2	127	146	50	NR	NR	NR
CGMN-F01-3LMF02-0-050812^ (C0096783 Spk F, 500 ng/g Lab Spike)	500	54.2	558	101	500	NR	NR	NR
CGMN-F01-5MDF01-0-050812^ (C0096784 Spk G, 50 ng/g Lab Spike)	50	256	334	*	50	NR	NR	NR
CGMN-F01-5MDF01-0-050812^ (C0096784 Spk H, 500 ng/g Lab Spike)	500	256	842	117	500	NR	NR	NR
CGMN-F01-5MDF02-0-050812^ (C0096785 Spk I, 50 ng/g Lab Spike)	50	5160	5340	*	50	NR	NR	NR
CGMN-F01-5MDF02-0-050812^ (C0096785 Spk J, 500 ng/g Lab Spike)	500	5160	5780	*	500	NR	NR	NR
CGMN-F01-5MDF03-0-050812^ (C0096786 Spk C, 50 ng/g Lab Spike)	50	892	1030	*	50	NR	NR	NR
CGMN-F01-5MDF03-0-050812^ (C0096786 Spk D, 500 ng/g Lab Spike)	500	892	1780	174	500	NR	NR	NR

^ 1.0 g of sample used for extraction instead of 5.0 g.
*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table III. Matrix Spike Recovery of PFOS and PFOA in Fish Samples Continued

Sample Description	C8 Sulfonate PFOS Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	Amt Found In Sample (ng/g)	Amount Recovered (ng/g)	Recovery (%)
CGMN-F01-5LMF01-0-050812^ (C0086787 Spk E, 50 ng/g Lab Spike)	50	334	354	*	50	NR	NR	NR
CGMN-F01-5LMF01-0-050812^ (C0086787 Spk F, 500 ng/g Lab Spike)	500	334	790	91	500	NR	NR	NR
CGMN-F01-5LMF02-0-050812^ (C0086788 Spk G, 50 ng/g Lab Spike)	50	348	390	*	50	NR	NR	NR
CGMN-F01-5LMF02-0-050812^ (C0086788 Spk H, 500 ng/g Lab Spike)	500	348	786	88	500	NR	NR	NR
			Average:	100			Average:	95
			Standard Deviation:	22			Standard Deviation:	15

^ 1.0 g of sample used for extraction instead of 5.0 g.
*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
NR = Not reported due to quality control result failures. See Table VI 'Matrix Spike Recovery Summary for PFBS and PFOA in Composite Fish Samples' for reanalyzed results.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g (2.5 ng/g for 1 g sample).
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Fish Samples

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0096695	CGMN-F01-1IPW01-0-050812	10	7.40	74
C0096695 Rep	CGMN-F01-1IPW01-0-050812	10	7.12	71
C0096695 Spk C	CGMN-F01-1IPW01-0-050812	10	6.32	63
C0096695 Spk D	CGMN-F01-1IPW01-0-050812	100	97.6	98
C0096696	CGMN-F01-1IPW02-0-050812	10	7.52	75
C0096696 Rep	CGMN-F01-1IPW02-0-050812	10	7.96	80
C0096696 Spk E	CGMN-F01-1IPW02-0-050812	10	7.32	73
C0096696 Spk F	CGMN-F01-1IPW02-0-050812	100	104	104
C0096697	CGMN-F01-1IPW03-0-050812	10	7.12	71
C0096697 Rep	CGMN-F01-1IPW03-0-050812	10	8.92	89
C0096697 Spk G	CGMN-F01-1IPW03-0-050812	10	7.92	79
C0096697 Spk H	CGMN-F01-1IPW03-0-050812	100	107	107
C0096698	CGMN-F01-1IPW04-0-050812	10	8.08	81
C0096698 Rep	CGMN-F01-1IPW04-0-050812	10	8.20	82
C0096698 Spk I	CGMN-F01-1IPW04-0-050812	10	7.08	71
C0096698 Spk J	CGMN-F01-1IPW04-0-050812	100	100	100
C0096699	CGMN-F01-1IPW05-0-050812	10	7.60	76
C0096699 Rep	CGMN-F01-1IPW05-0-050812	10	9.04	90
C0096699 Spk K	CGMN-F01-1IPW05-0-050812	10	6.76	68
C0096699 Spk L	CGMN-F01-1IPW05-0-050812	100	105	105
C0096700	CGMN-F01-3IPW01-050812	10	6.60	66
C0096700 Rep	CGMN-F01-3IPW01-050812	10	6.44	64
C0096700 Spk C	CGMN-F01-3IPW01-050812	10	6.00	60
C0096700 Spk D	CGMN-F01-3IPW01-050812	100	85.6	86
C0096701	CGMN-F01-3IPW02-050812	10	5.48	55
C0096701 Rep	CGMN-F01-3IPW02-050812	10	6.16	62
C0096701 Spk E	CGMN-F01-3IPW02-050812	10	5.32	53
C0096701 Spk F	CGMN-F01-3IPW02-050812	100	88.4	88
C0096702	CGMN-F01-3IPW03-050812	10	7.20	72
C0096702 Rep	CGMN-F01-3IPW03-050812	10	7.72	77
C0096702 Spk G	CGMN-F01-3IPW03-050812	10	7.20	72
C0096702 Spk H	CGMN-F01-3IPW03-050812	100	98.0	98
C0096703	CGMN-F01-3IPW04-050812	10	7.84	78
C0096703 Rep	CGMN-F01-3IPW04-050812	10	7.72	77
C0096703 Spk I	CGMN-F01-3IPW04-050812	10	7.96	80
C0096703 Spk J	CGMN-F01-3IPW04-050812	100	87.2	87
C0096704	CGMN-F01-3IPW05-050812	10	5.12	51
C0096704 Rep	CGMN-F01-3IPW05-050812	10	6.00	60
C0096704 Spk K	CGMN-F01-3IPW05-050812	10	5.56	56
C0096704 Spk L	CGMN-F01-3IPW05-050812	100	95.2	95

^ 1.0 g of sample used for extraction instead of 5.0 g.
NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of ^{13}C-PFOA in Composite Fish Samples' for reanalyzed results.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Fish Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0096705	CGMN-F01-5IPW01-0-050812	10	8.36	84
C0096705 Rep	CGMN-F01-5IPW01-0-050812	10	9.48	95
C0096705 Spk C	CGMN-F01-5IPW01-0-050812	10	7.88	79
C0096705 Spk D	CGMN-F01-5IPW01-0-050812	100	106	106
C0096706	CGMN-F01-5IPW02-0-050812	10	9.12	91
C0096706 Rep	CGMN-F01-5IPW02-0-050812	10	8.96	90
C0096706 Spk E	CGMN-F01-5IPW02-0-050812	10	8.44	84
C0096706 Spk F	CGMN-F01-5IPW02-0-050812	100	119	119
C0096707	CGMN-F01-5IPW03-0-050812	10	10.2	102
C0096707 Rep	CGMN-F01-5IPW03-0-050812	10	9.52	95
C0096707 Spk G	CGMN-F01-5IPW03-0-050812	10	8.36	84
C0096707 Spk H	CGMN-F01-5IPW03-0-050812	100	99.6	100
C0096708	CGMN-F01-5IPW04-0-050812	10	12.5	125
C0096708 Rep	CGMN-F01-5IPW04-0-050812	10	12.2	122
C0096708 Spk I	CGMN-F01-5IPW04-0-050812	10	9.36	94
C0096708 Spk J	CGMN-F01-5IPW04-0-050812	100	88.0	88
C0096709	CGMN-F01-5IPW05-0-050812	10	12.4	124
C0096709 Rep	CGMN-F01-5IPW05-0-050812	10	13.6	136
C0096709 Spk K	CGMN-F01-5IPW05-0-050812	10	10.8	108
C0096709 Spk L	CGMN-F01-5IPW05-0-050812	100	94.0	94
C0096710	CGMN-F01-1IPF01-0-050812	10	12.0	120
C0096710 Rep	CGMN-F01-1IPF01-0-050812	10	11.2	112
C0096710 Spk C	CGMN-F01-1IPF01-0-050812	10	10.6	106
C0096710 Spk D	CGMN-F01-1IPF01-0-050812	100	91.2	91
C0096711	CGMN-F01-1IPF02-0-050812	10	11.8	118
C0096711 Rep	CGMN-F01-1IPF02-0-050812	10	11.9	119
C0096711 Spk E	CGMN-F01-1IPF02-0-050812	10	10.3	103
C0096711 Spk F	CGMN-F01-1IPF02-0-050812	100	90.0	90
C0096712	CGMN-F01-1IPF03-0-050812	10	11.9	119
C0096712 Rep	CGMN-F01-1IPF03-0-050812	10	12.3	123
C0096712 Spk G	CGMN-F01-1IPF03-0-050812	10	10.5	105
C0096712 Spk H	CGMN-F01-1IPF03-0-050812	100	84.8	85
C0096713	CGMN-F01-1IPF04-0-050812	10	11.7	117
C0096713 Rep	CGMN-F01-1IPF04-0-050812	10	12.0	120
C0096713 Spk I	CGMN-F01-1IPF04-0-050812	10	10.5	105
C0096713 Spk J	CGMN-F01-1IPF04-0-050812	100	90.8	91
C0096714	CGMN-F01-1IPF05-0-050812	10	12.3	123
C0096714 Rep	CGMN-F01-1IPF05-0-050812	10	11.6	116
C0096714 Spk K	CGMN-F01-1IPF05-0-050812	10	11.2	112
C0096714 Spk L	CGMN-F01-1IPF05-0-050812	100	86.8	87

[A] 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of ^{13}C-PFOA in Composite Fish Samples' for reanalyzed results.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Fish Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	^{13}C-PFOA Amount Recovered (ng/g)	^{13}C-PFOA Recovery (%)
C0096715	CGMN-F01-3IPF01-0-050812	10	11.8	118
C0096715 Rep	CGMN-F01-3IPF01-0-050812	10	12.1	121
C0096715 Spk C	CGMN-F01-3IPF01-0-050812	10	10.2	102
C0096715 Spk D	CGMN-F01-3IPF01-0-050812	100	88.4	88
C0096716	CGMN-F01-3IPF02-0-050812	10	12.0	120
C0096716 Rep	CGMN-F01-3IPF02-0-050812	10	11.5	115
C0096716 Spk E	CGMN-F01-3IPF02-0-050812	10	10.9	109
C0096716 Spk F	CGMN-F01-3IPF02-0-050812	100	89.2	89
C0096717	CGMN-F01-3IPF03-0-050812	10	12.8	128
C0096717 Rep	CGMN-F01-3IPF03-0-050812	10	12.1	121
C0096717 Spk G	CGMN-F01-3IPF03-0-050812	10	11.5	115
C0096717 Spk H	CGMN-F01-3IPF03-0-050812	100	95.2	95
C0096718	CGMN-F01-3IPF04-0-050812	10	12.0	120
C0096718 Rep	CGMN-F01-3IPF04-0-050812	10	11.4	114
C0096718 Spk I	CGMN-F01-3IPF04-0-050812	10	10.2	102
C0096718 Spk J	CGMN-F01-3IPF04-0-050812	100	84.4	84
C0096719	CGMN-F01-3IPF05-0-050812	10	11.0	110
C0096719 Rep	CGMN-F01-3IPF05-0-050812	10	12.4	124
C0096719 Spk K	CGMN-F01-3IPF05-0-050812	10	10.8	108
C0096719 Spk L	CGMN-F01-3IPF05-0-050812	100	90.4	90
C0096720	CGMN-F01-5IPF01-0-050812	10	10.4	104
C0096720 Rep	CGMN-F01-5IPF01-0-050812	10	11.6	116
C0096720 Spk C	CGMN-F01-5IPF01-0-050812	10	10.4	104
C0096720 Spk D	CGMN-F01-5IPF01-0-050812	100	95.6	96
C096721	CGMN-F01-5IPF02-0-050812	10	12.6	126
C0096721 Rep	CGMN-F01-5IPF02-0-050812	10	12.0	120
C0096721 Spk E	CGMN-F01-5IPF02-0-050812	10	10.8	108
C0096721 Spk F	CGMN-F01-5IPF02-0-050812	100	92.0	92
C096722	CGMN-F01-5IPF03-0-050812	10	10.1	101
C0096722 Rep	CGMN-F01-5IPF03-0-050812	10	10.4	104
C0096722 Spk G	CGMN-F01-5IPF03-0-050812	10	9.08	91
C0096722 Spk H	CGMN-F01-5IPF03-0-050812	100	103	103
C0096723	CGMN-F01-5IPF04-0-050812	10	12.9	129
C0096723 Rep	CGMN-F01-5IPF04-0-050812	10	12.4	124
C0096723 Spk I	CGMN-F01-5IPF04-0-050812	10	10.9	109
C0096723 Spk J	CGMN-F01-5IPF04-0-050812	100	90.0	90
C0096724	CGMN-F01-5IPF05-0-050812	10	12.2	122
C0096724 Rep	CGMN-F01-5IPF05-0-050812	10	11.5	115
C0096724 Spk K	CGMN-F01-5IPF05-0-050812	10	11.0	110
C0096724 Spk L	CGMN-F01-5IPF05-0-050812	100	92.8	93

^ 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of ^{13}C-PFOA in Composite Fish Samples' for reanalyzed results.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Fish Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0096725	CGMN-F01-1LMW01-0-050812	10	9.28	93
C0096725 Rep	CGMN-F01-1LMW01-0-050812	10	8.84	88
C0096725 Spk C	CGMN-F01-1LMW01-0-050812	10	8.68	87
C0096725 Spk D	CGMN-F01-1LMW01-0-050812	100	116	116
C0096726	CGMN-F01-1LMW02-0-050812	10	8.60	86
C0096726 Rep	CGMN-F01-1LMW02-0-050812	10	8.88	89
C0096726 Spk E	CGMN-F01-1LMW02-0-050812	10	8.44	84
C0096726 Spk F	CGMN-F01-1LMW02-0-050812	100	112	112
C0096727	CGMN-F01-1LMW03-0-050812	10	8.60	86
C0096727 Rep	CGMN-F01-1LMW03-0-050812	10	9.32	93
C0096727 Spk G	CGMN-F01-1LMW03-0-050812	10	10.2	102
C0096727 Spk H	CGMN-F01-1LMW03-0-050812	100	112	112
C0096728	CGMN-F01-1LMW04-0-050812	10	9.68	97
C0096728 Rep	CGMN-F01-1LMW04-0-050812	10	10.2	102
C0096728 Spk I	CGMN-F01-1LMW04-0-050812	10	8.84	88
C0096728 Spk J	CGMN-F01-1LMW04-0-050812	100	120	120
C0096729	CGMN-F01-1LMW05-0-050812	10	8.88	89
C0096729 Rep	CGMN-F01-1LMW05-0-050812	10	9.28	93
C0096729 Spk K	CGMN-F01-1LMW05-0-050812	10	8.12	81
C0096729 Spk L	CGMN-F01-1LMW05-0-050812	100	120	120
C0096730	CGMN-F01-3LMW01-0-050812	10	6.60	66
C0096730 Rep	CGMN-F01-3LMW01-0-050812	10	6.04	60
C0096730 Spk C	CGMN-F01-3LMW01-0-050812	10	5.48	55
C0096730 Spk D	CGMN-F01-3LMW01-0-050812	100	105	105
C0096731	CGMN-F01-3LMW02-0-050812	10	8.16	82
C0096731 Rep	CGMN-F01-3LMW02-0-050812	10	8.20	82
C0096731 Spk E	CGMN-F01-3LMW02-0-050812	10	7.64	76
C0096731 Spk F	CGMN-F01-3LMW02-0-050812	100	116	116
C0096732	CGMN-F01-3LMW03-0-050812	10	9.00	90
C0096732 Rep	CGMN-F01-3LMW03-0-050812	10	8.48	85
C0096732 Spk G	CGMN-F01-3LMW03-0-050812	10	7.88	79
C0096732 Spk H	CGMN-F01-3LMW03-0-050812	100	115	115
C0096733	CGMN-F01-3LMW04-0-050812	10	9.08	91
C0096733 Rep	CGMN-F01-3LMW04-0-050812	10	8.80	88
C0096733 Spk I	CGMN-F01-3LMW04-0-050812	10	7.92	79
C0096733 Spk J	CGMN-F01-3LMW04-0-050812	100	114	114
C0096734	CGMN-F01-3LMW05-0-050812	10	9.88	99
C0096734 Rep	CGMN-F01-3LMW05-0-050812	10	9.52	95
C0096734 Spk K	CGMN-F01-3LMW05-0-050812	10	8.28	83
C0096734 Spk L	CGMN-F01-3LMW05-0-050812	100	114	114

^ 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of ^{13}C-PFOA in Composite Fish Samples' for reanalyzed results.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Fish Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	^{13}C-PFOA Amount Recovered (ng/g)	^{13}C-PFOA Recovery (%)
C0096735^	CGMN-F01-5LMW01-0-050812	50	NR	NR
C0096735 Rep^	CGMN-F01-5LMW01-0-050812	50	NR	NR
C0096735 Spk C^	CGMN-F01-5LMW01-0-050812	50	NR	NR
C0096735 Spk D^	CGMN-F01-5LMW01-0-050812	500	NR	NR
C0096736^	CGMN-F01-5LMW02-0-050812	50	NR	NR
C0096736 Rep^	CGMN-F01-5LMW02-0-050812	50	NR	NR
C0096736 Spk E^	CGMN-F01-5LMW02-0-050812	50	NR	NR
C0096736 Spk F^	CGMN-F01-5LMW02-0-050812	500	NR	NR
C0096737^	CGMN-F01-5LMW03-0-050812	50	NR	NR
C0096737 Rep^	CGMN-F01-5LMW03-0-050812	50	NR	NR
C0096737 Spk G^	CGMN-F01-5LMW03-0-050812	50	NR	NR
C0096737 Spk H^	CGMN-F01-5LMW03-0-050812	500	NR	NR
C0096738^	CGMN-F01-5LMW04-0-050812	50	NR	NR
C0096738 Rep^	CGMN-F01-5LMW04-0-050812	50	NR	NR
C0096738 Spk I^	CGMN-F01-5LMW04-0-050812	50	NR	NR
C0096738 Spk J^	CGMN-F01-5LMW04-0-050812	500	NR	NR
C0096739^	CGMN-F01-5LMW05-0-050812	50	NR	NR
C0096739 Rep^	CGMN-F01-5LMW05-0-050812	50	NR	NR
C0096739 Spk K^	CGMN-F01-5LMW05-0-050812	50	NR	NR
C0096739 Spk L^	CGMN-F01-5LMW05-0-050812	500	NR	NR
C0096740	CGMN-F01-1MDF01-0-050812	10	8.00	80
C0096740 Rep	CGMN-F01-1MDF01-0-050812	10	8.24	82
C0096740 Spk C	CGMN-F01-1MDF01-0-050812	10	7.36	74
C0096740 Spk D	CGMN-F01-1MDF01-0-050812	100	84.8	85
C0096741	CGMN-F01-1MDF02-0-050812	10	7.92	79
C0096741 Rep	CGMN-F01-1MDF02-0-050812	10	6.72	67
C0096741 Spk E	CGMN-F01-1MDF02-0-050812	10	7.08	71
C0096741 Spk F	CGMN-F01-1MDF02-0-050812	100	74.8	75
C0096742	CGMN-F01-1MDF03-0-050812	10	7.24	72
C0096742 Rep	CGMN-F01-1MDF03-0-050812	10	6.72	67
C0096742 Spk G	CGMN-F01-1MDF03-0-050812	10	6.80	68
C0096742 Spk H	CGMN-F01-1MDF03-0-050812	100	82.4	82
C0096744	CGMN-F01-1MDF04-0-050812	10	7.52	75
C0096744 Rep	CGMN-F01-1MDF04-0-050812	10	6.56	66
C0096744 Spk I	CGMN-F01-1MDF04-0-050812	10	6.68	67
C0096744 Spk J	CGMN-F01-1MDF04-0-050812	100	80.0	80
C0096747	CGMN-F01-1MDF05-0-050812	10	7.20	72
C0096747 Rep	CGMN-F01-1MDF05-0-050812	10	7.08	71
C0096747 Spk K	CGMN-F01-1MDF05-0-050812	10	6.76	68
C0096747 Spk L	CGMN-F01-1MDF05-0-050812	100	71.6	72

^ 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of ^{13}C-PFOA in Composite Fish Samples' for reanalyzed results.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Fish Samples Continued

		^{13}C-PFOA		
Exygen ID	Sample Description	Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0096750^	CGMN-F01-1LMF01-0-050812	50	NR	NR
C0096750 Rep^	CGMN-F01-1LMF01-0-050812	50	NR	NR
C0096750 Spk C^	CGMN-F01-1LMF01-0-050812	50	NR	NR
C0096750 Spk D^	CGMN-F01-1LMF01-0-050812	500	NR	NR
C0096753^	CGMN-F01-1LMF02-0-050812	50	NR	NR
C0096753 Rep^	CGMN-F01-1LMF02-0-050812	50	NR	NR
C0096753 Spk E^	CGMN-F01-1LMF02-0-050812	50	NR	NR
C0096753 Spk F^	CGMN-F01-1LMF02-0-050812	500	NR	NR
C0096755^	CGMN-F01-3MDF01-0-050812	50	NR	NR
C0096755 Rep^	CGMN-F01-3MDF01-0-050812	50	NR	NR
C0096755 Spk G^	CGMN-F01-3MDF01-0-050812	50	NR	NR
C0096755 Spk H^	CGMN-F01-3MDF01-0-050812	500	NR	NR
C0096758^	CGMN-F01-3MDF02-0-050812	50	NR	NR
C0096758 Rep^	CGMN-F01-3MDF02-0-050812	50	NR	NR
C0096758 Spk I^	CGMN-F01-3MDF02-0-050812	50	NR	NR
C0096758 Spk J^	CGMN-F01-3MDF02-0-050812	500	NR	NR
C0096781^	CGMN-F01-3MDF03-0-050812	50	NR	NR
C0096781 Rep^	CGMN-F01-3MDF03-0-050812	50	NR	NR
C0096781 Spk K^	CGMN-F01-3MDF03-0-050812	50	NR	NR
C0096781 Spk L^	CGMN-F01-3MDF03-0-050812	500	NR	NR
C0096782^	CGMN-F01-3LMF01-0-050812	50	NR	NR
C0096782 Rep^	CGMN-F01-3LMF01-0-050812	50	NR	NR
C0096782 Spk C^	CGMN-F01-3LMF01-0-050812	50	NR	NR
C0096782 Spk D^	CGMN-F01-3LMF01-0-050812	500	NR	NR
C0096783^	CGMN-F01-3LMF02-0-050812	50	NR	NR
C0096783 Rep^	CGMN-F01-3LMF02-0-050812	50	NR	NR
C0096783 Spk E^	CGMN-F01-3LMF02-0-050812	50	NR	NR
C0096783 Spk F^	CGMN-F01-3LMF02-0-050812	500	NR	NR
C0096784^	CGMN-F01-5MDF01-0-050812	50	NR	NR
C0096784 Rep^	CGMN-F01-5MDF01-0-050812	50	NR	NR
C0096784 Spk G^	CGMN-F01-5MDF01-0-050812	50	NR	NR
C0096784 Spk H^	CGMN-F01-5MDF01-0-050812	500	NR	NR
C0096785^	CGMN-F01-5MDF02-0-050812	50	NR	NR
C0096785 Rep^	CGMN-F01-5MDF02-0-050812	50	NR	NR
C0096785 Spk I^	CGMN-F01-5MDF02-0-050812	50	NR	NR
C0096785 Spk J^	CGMN-F01-5MDF02-0-050812	500	NR	NR
C0096786^	CGMN-F01-5MDF03-0-050812	50	NR	NR
C0096786 Rep^	CGMN-F01-5MDF03-0-050812	50	NR	NR
C0096786 Spk C^	CGMN-F01-5MDF03-0-050812	50	NR	NR
C0096786 Spk D^	CGMN-F01-5MDF03-0-050812	500	NR	NR

^ 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of ^{13}C-PFOA in Composite Fish Samples' for reanalyzed results.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table IV. Surrogate Spike Recovery of ^{13}C PFOA in Fish Samples Continued

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0096787^	CGMN-F01-5LMF01-0-050812	50	NR	NR
C0096787 Rep^	CGMN-F01-5LMF01-0-050812	50	NR	NR
C0096787 Spk E^	CGMN-F01-5LMF01-0-050812	50	NR	NR
C0096787 Spk F^	CGMN-F01-5LMF01-0-050812	500	NR	NR
C0096788^	CGMN-F01-5LMF02-0-050812	50	NR	NR
C0096788 Rep^	CGMN-F01-5LMF02-0-050812	50	NR	NR
C0096788 Spk G^	CGMN-F01-5LMF02-0-050812	50	NR	NR
C0096788 Spk H^	CGMN-F01-5LMF02-0-050812	500	NR	NR
			Average:	93
			Standard Deviation:	19

^ 1.0 g of sample used for extraction instead of 5.0 g.

NR = Not reported due to quality control result failures. See Table VII 'Surrogate Spike Recovery Summary of ^{13}C-PFOA in Composite Fish Samples' for reanalyzed results.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

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2095.0492

Table V. Summary of PFBS and PFOA in Composite Fish Samples

			C4 Sulfonate PFBS		C8 Acid PFOA	
Client Sample ID	Exygen ID	Composited Client Sample ID	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)	Analyte Found Wet Weight (ppb, ng/g)	Assessed Accuracy (+% / - %)
CGMN-F01-3LMW01-0-050812	C0096730^	——	127	60	—	—
CGMN-F01-3LMW01-0-050812*	C0096730 Rep^	——	116	60	—	—
CGMN-F01-3LMW02-0-050812	C0096731^	——	173	60	—	—
CGMN-F01-3LMW02-0-050812*	C0096731 Rep^	——	186	60	—	—
CGMN-F01-3LMW03-0-050812	C0096732^	——	140	60	—	—
CGMN-F01-3LMW03-0-050812*	C0096732 Rep^	——	170	60	—	—
CGMN-F01-5LMW01-0-050812	C0141931	CGMN-F01-5LMWC-0-050812	—	—	0.608	30
CGMN-F01-5LMW02-0-050812	C0141931 Rep	CGMN-F01-5LMWC-0-050812*	—	—	0.592	30
CGMN-F01-5LMW03-0-050812						
CGMN-F01-5LMW04-0-050812						
CGMN-F01-5LMW05-0-050812						
CGMN-F01-1LMF01-0-050812	C0141932	CGMN-F01-1LMFC-0-050812	—	—	ND	30
CGMN-F01-1LMF02-0-050812	C0141932 Rep	CGMN-F01-1LMFC-0-050812*	—	—	ND	30
CGMN-F01-3MDF01-0-050812	C0141933	CGMN-F01-3MDFC-0-050812	—	—	0.516	30
CGMN-F01-3MDF02-0-050812	C0141933 Rep	CGMN-F01-3MDFC-0-050812*	—	—	0.644	30
CGMN-F01-3MDF03-0-050812						
CGMN-F01-3LMF01-0-050812	C0141934	CGMN-F01-3LMFC-0-050812	—	—	3.29	30
CGMN-F01-3LMF02-0-050812	C0141934 Rep	CGMN-F01-3LMFC-0-050812*	—	—	3.12	30
CGMN-F01-5MDF01-0-050812	C0141935	CGMN-F01-5MDFC-0-050812	—	—	1.00	30
CGMN-F01-5MDF02-0-050812	C0141935 Rep	CGMN-F01-5MDFC-0-050812*	—	—	1.08	30
CGMN-F01-5MDF03-0-050812						
CGMN-F01-5LMF01-0-050812	C0141936	CGMN-F01-5LMFC-0-050812	—	—	ND	30
CGMN-F01-5LMF02-0-050812	C0141936 Rep	CGMN-F01-5LMFC-0-050812*	—	—	0.504	30

— = Results shown in preceding tables; not a target analyte for reanalyses.
*Laboratory Duplicate
^Sample was re-extracted only. There was no composite made for this sample.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g.

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Table VI. Matrix Spike Recovery of PFBS and PFOA in Composite Fish Samples

Sample Description	C4 Sulfonate PFBS Amount Spiked (ng/g)	C4 Sulfonate PFBS Amt Found in Sample (ng/g)	C4 Sulfonate PFBS Amount Recovered (ng/g)	C4 Sulfonate PFBS Recovery (%)	C8 Acid PFOA Amount Spiked (ng/g)	C8 Acid PFOA Amt Found in Sample (ng/g)	C8 Acid PFOA Amount Recovered (ng/g)	C8 Acid PFOA Recovery (%)
CGMN-F01-3LMW01-0-050812^ (C0096730 Spk C, 10 ng/g Lab Spike)	10	127	148	*	10	—	—	—
CGMN-F01-3LMW01-0-050812^ (C0096730 Spk D, 100 ng/g Lab Spike)	100	127	172	45	100	—	—	—
CGMN-F01-3LMW02-0-050812^ (C0096731 Spk E, 10 ng/g Lab Spike)	10	173	177	*	10	—	—	—
CGMN-F01-3LMW02-0-050812^ (C0096731 Spk F, 100 ng/g Lab Spike)	100	173	330	157	100	—	—	—
CGMN-F01-3LMW03-0-050812^ (C0096732 Spk G, 10 ng/g Lab Spike)	10	140	152	*	10	—	—	—
CGMN-F01-3LMW03-0-050812^ (C0096732 Spk H, 100 ng/g Lab Spike)	100	140	193	53	100	—	—	—
CGMN-F01-5LMWC-0-050812 (C0141931 Spk I, 10 ng/g Lab Spike)	10	—	—	—	10	0.608	9.56	90
CGMN-F01-5LMWC-0-050812 (C0141931 Spk J, 100 ng/g Lab Spike)	100	—	—	—	100	0.608	115	114
CGMN-F01-1LMFC-0-050812 (C0141932 Spk K, 10 ng/g Lab Spike)	10	—	—	—	10	ND	11.5	115
CGMN-F01-1LMFC-0-050812 (C0141932 Spk L, 100 ng/g Lab Spike)	100	—	—	—	100	ND	124	124
CGMN-F01-3MDFC-0-050812 (C0141933 Spk C, 10 ng/g Lab Spike)	10	—	—	—	10	0.516	11.1	106
CGMN-F01-3MDFC-0-050812 (C0141933 Spk D, 100 ng/g Lab Spike)	100	—	—	—	100	0.516	106	105
CGMN-F01-3LMFC-0-050812 (C0141934 Spk E, 10 ng/g Lab Spike)	10	—	—	—	10	3.29	13.7	104
CGMN-F01-3LMFC-0-050812 (C0141934 Spk F, 100 ng/g Lab Spike)	100	—	—	—	100	3.29	120	117
CGMN-F01-5MDFC-0-050812 (C0141935 Spk G, 10 ng/g Lab Spike)	10	—	—	—	10	1.00	10.8	98
CGMN-F01-5MDFC-0-050812 (C0141935 Spk H, 100 ng/g Lab Spike)	100	—	—	—	100	1.00	110	109
CGMN-F01-5LMFC-0-050812 (C0141936 Spk I, 10 ng/g Lab Spike)	10	—	—	—	10	ND	11.5	115
CGMN-F01-5LMFC-0-050812 (C0141936 Spk J, 100 ng/g Lab Spike)	100	—	—	—	100	ND	130	130
			Average (n=3):	85			Average (n=12):	111
			Standard Deviation (n=3):	62			Standard Deviation (n=12):	11

— = Results shown in preceding tables; not a target analyte for reanalyses.
*Sample residue exceeds the spiking level significantly (3x spiking level); therefore, an accurate recovery value cannot be calculated
^Sample was re-extracted only. There was no composite made for this sample.
ND = Not detected at or above the Limit of Quantitation (LOQ) which is 0.5 ng/g.
Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

Table VII. Surrogate Spike Recovery of ^{13}C PFOA in Composite Fish Samples

Exygen ID	Sample Description	^{13}C-PFOA Amount Spiked (ng/g)	Amount Recovered (ng/g)	Recovery (%)
C0096730^	CGMN-F01-3LMW01-0-050812	10	6.08	61
C0096730 Rep^	CGMN-F01-3LMW01-0-050812	10	5.96	60
C0096730 Spk C^	CGMN-F01-3LMW01-0-050812	10	6.16	62
C0096730 Spk D^	CGMN-F01-3LMW01-0-050812	100	108	108
C0096731^	CGMN-F01-3LMW02-0-050812	10	8.12	81
C0096731 Rep^	CGMN-F01-3LMW02-0-050812	10	8.16	82
C0096731 Spk E^	CGMN-F01-3LMW02-0-050812	10	8.52	85
C0096731 Spk F^	CGMN-F01-3LMW02-0-050812	100	122	122
C0096732^	CGMN-F01-3LMW03-0-050812	10	8.76	88
C0096732 Rep^	CGMN-F01-3LMW03-0-050812	10	8.16	82
C0096732 Spk G^	CGMN-F01-3LMW03-0-050812	10	9.40	94
C0096732 Spk H^	CGMN-F01-3LMW03-0-050812	100	112	112
C0141931	CGMN-F01-5LMWC-0-050812	10	8.96	90
C0141931 Rep	CGMN-F01-5LMWC-0-050812	10	8.76	88
C00141931 Spk I	CGMN-F01-5LMWC-0-050812	10	8.68	87
C00141931 Spk J	CGMN-F01-5LMWC-0-050812	100	116	116
C0141932	CGMN-F01-1LMFC-0-050812	10	11.4	114
C0141932 Rep	CGMN-F01-1LMFC-0-050812	10	11.9	119
C0141932 Spk K	CGMN-F01-1LMFC-0-050812	10	11.4	114
C0141932 Spk L	CGMN-F01-1LMFC-0-050812	100	121	121
C0141933	CGMN-F01-3MDFC-0-050812	10	10.6	106
C0141933 Rep	CGMN-F01-3MDFC-0-050812	10	11.0	110
C0141933 Spk C	CGMN-F01-3MDFC-0-050812	10	10.4	104
C0141933 Dpk D	CGMN-F01-3MDFC-0-050812	100	105	105
C0141934	CGMN-F01-3LMFC-0-050812	10	9.68	97
C0141934 Rep	CGMN-F01-3LMFC-0-050812	10	10.0	100
C0141934 Spk E	CGMN-F01-3LMFC-0-050812	10	9.96	100
C0141934 Spk F	CGMN-F01-3LMFC-0-050812	100	114	114
C0141935	CGMN-F01-5MDFC-0-050812	10	9.40	94
C0141935 Rep	CGMN-F01-5MDFC-0-050812	10	9.68	97
C0141935 Spk G	CGMN-F01-5MDFC-0-050812	10	9.56	96
C0141935 Spk H	CGMN-F01-5MDFC-0-050812	100	109	109
C01491936	CGMN-F01-5LMFC-0-050812	10	10.6	106
C0141936 Rep	CGMN-F01-5LMFC-0-050812	10	11.3	113
C0141936 Spk I	CGMN-F01-5LMFC-0-050812	10	11.1	111
C0141936 Spk J	CGMN-F01-5LMFC-0-050812	100	129	129
			Average:	**99**
			Standard Deviation:	**17**

^Sample was re-extracted only. There was no composite made for this sample.

Note: Since this summary table shows rounded results, recovery values may vary slightly from the values in the raw data.

FIGURES

Figure 1. Typical Calibration Curve for PFOA in Methanol

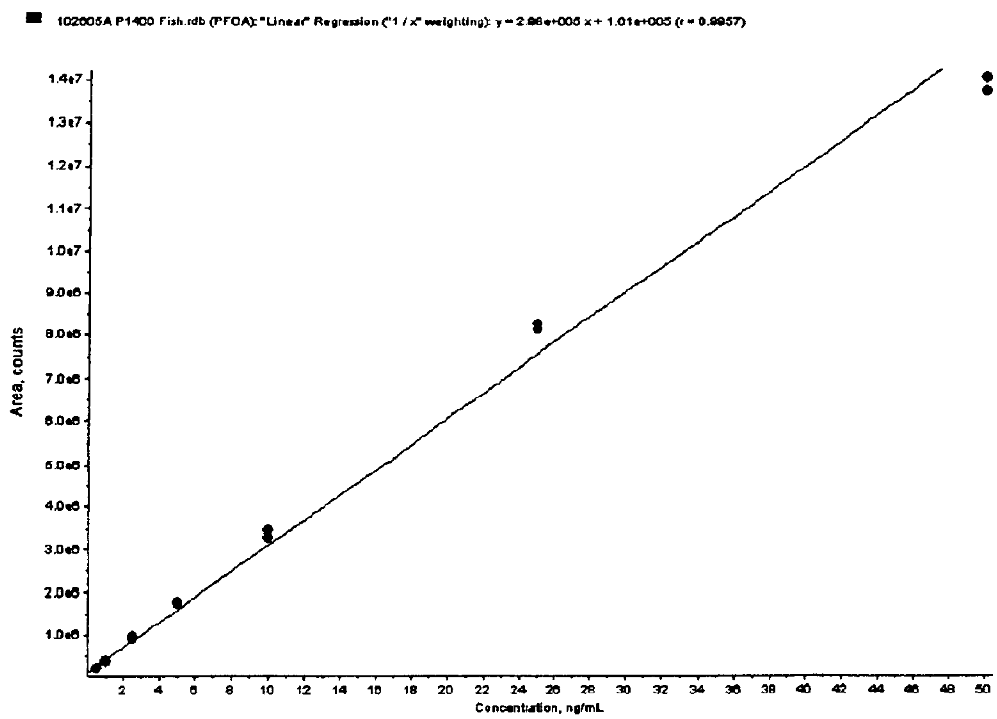

Figure 2. Non-extracted Standards of PFOA in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively

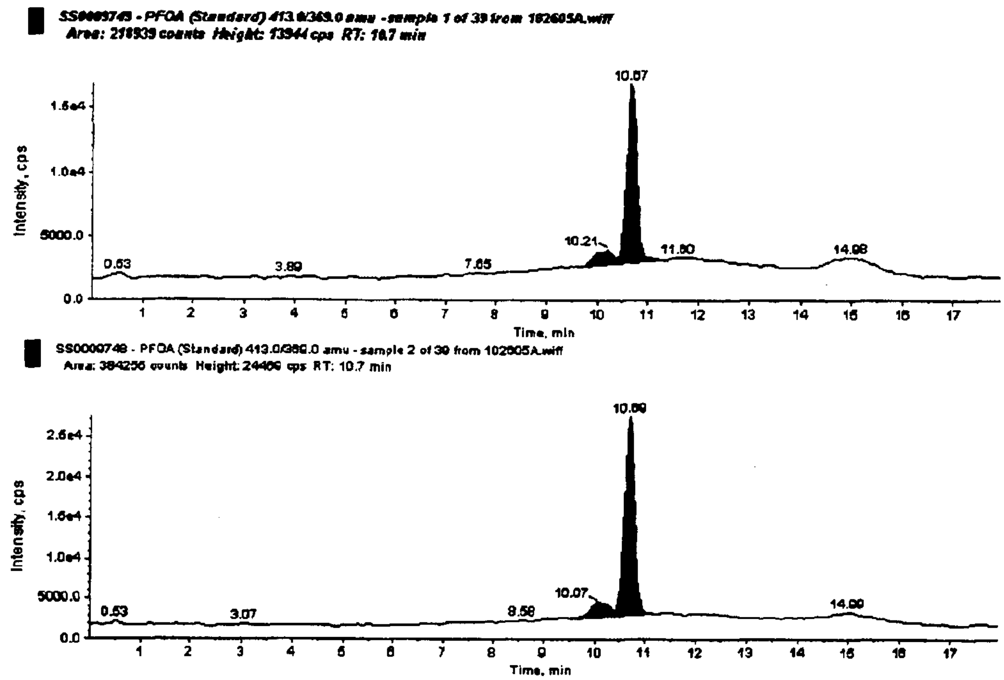

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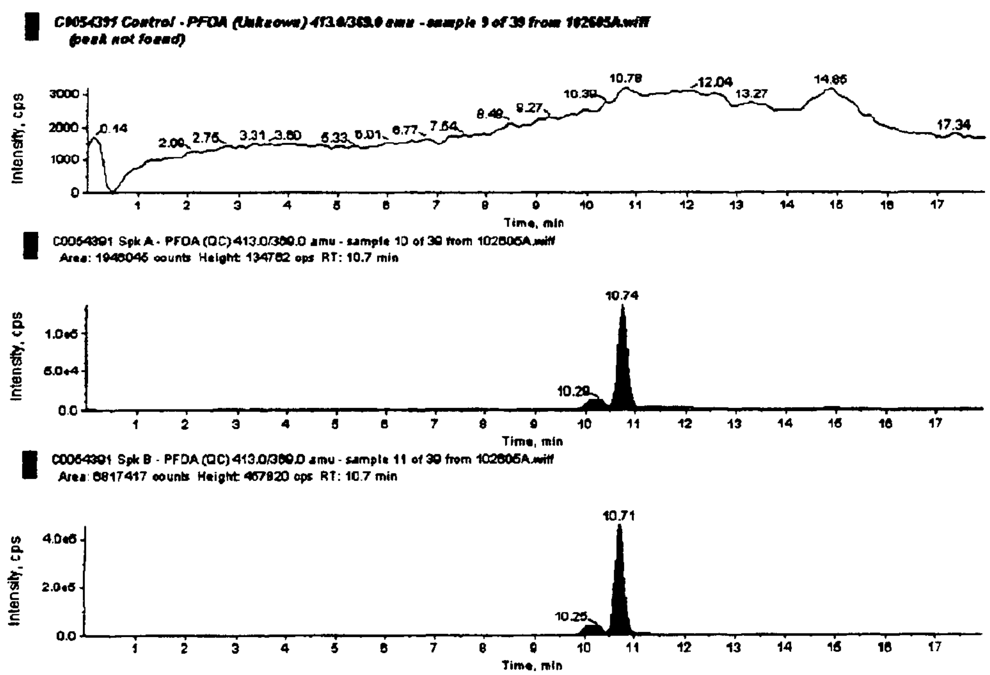
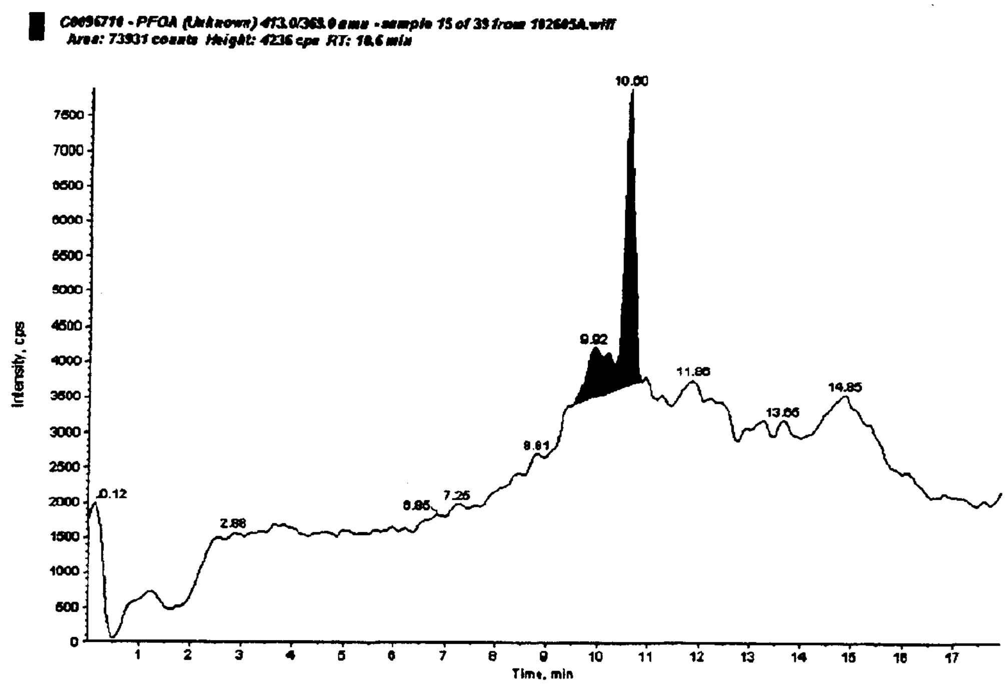
Figure 3. PFOA in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively



3MA01552276

2095.0499

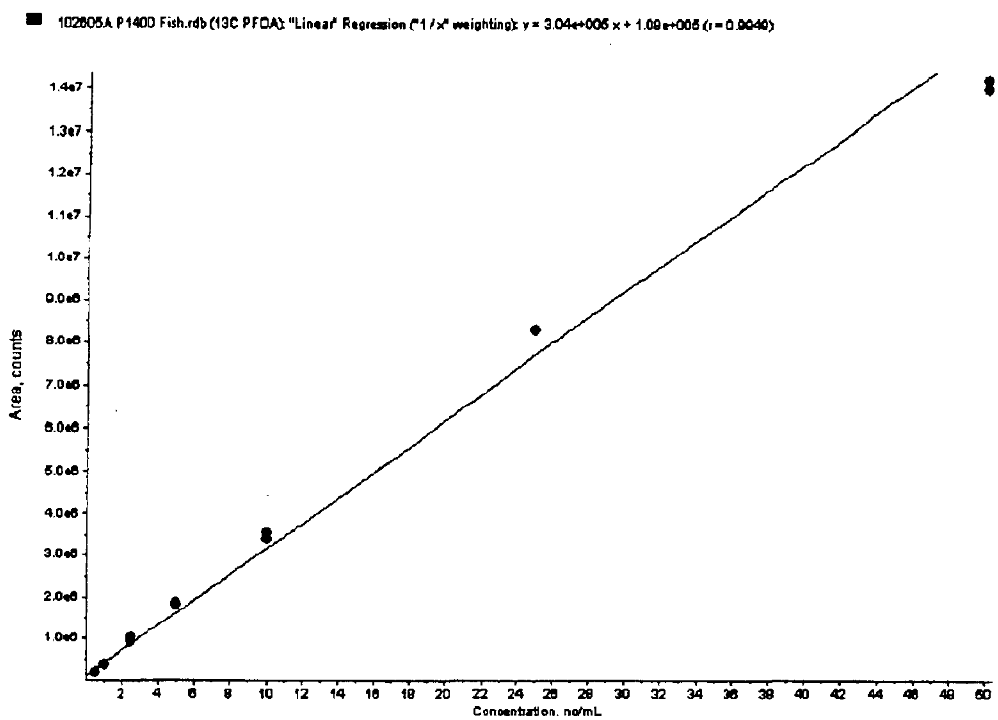
Figure 4. Chromatogram Representing a Fish Sample Analyzed for PFOA (Exygen ID: C0096710, Data Set: 102605A)



3MA01552277

2095.0500

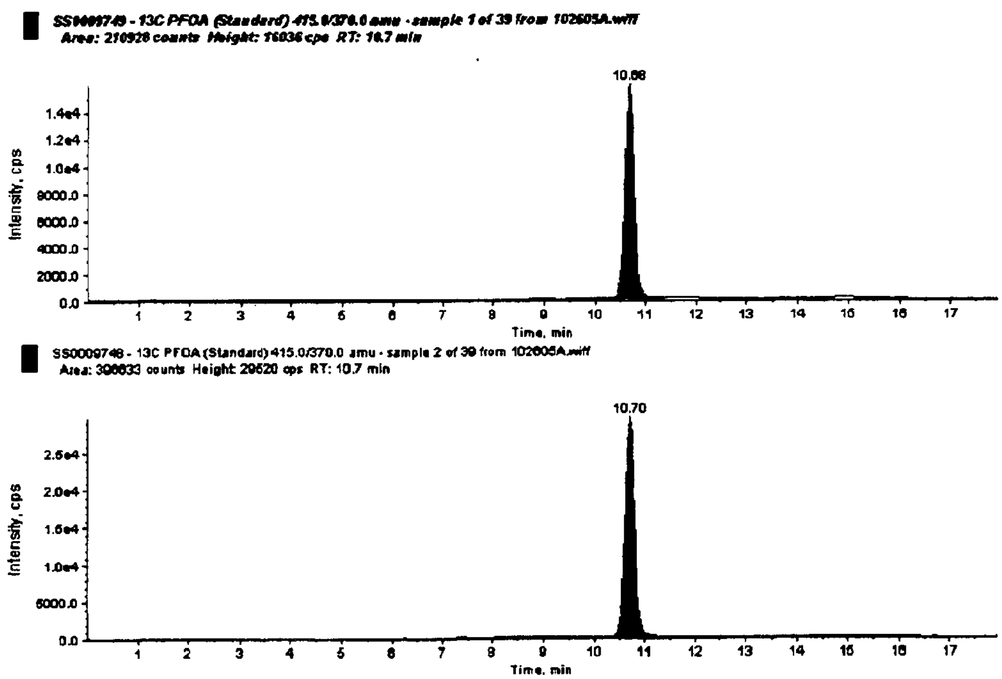
Figure 5. Typical Calibration Curve for ^{13}C PFOA in Methanol



3MA01552278

2095.0501

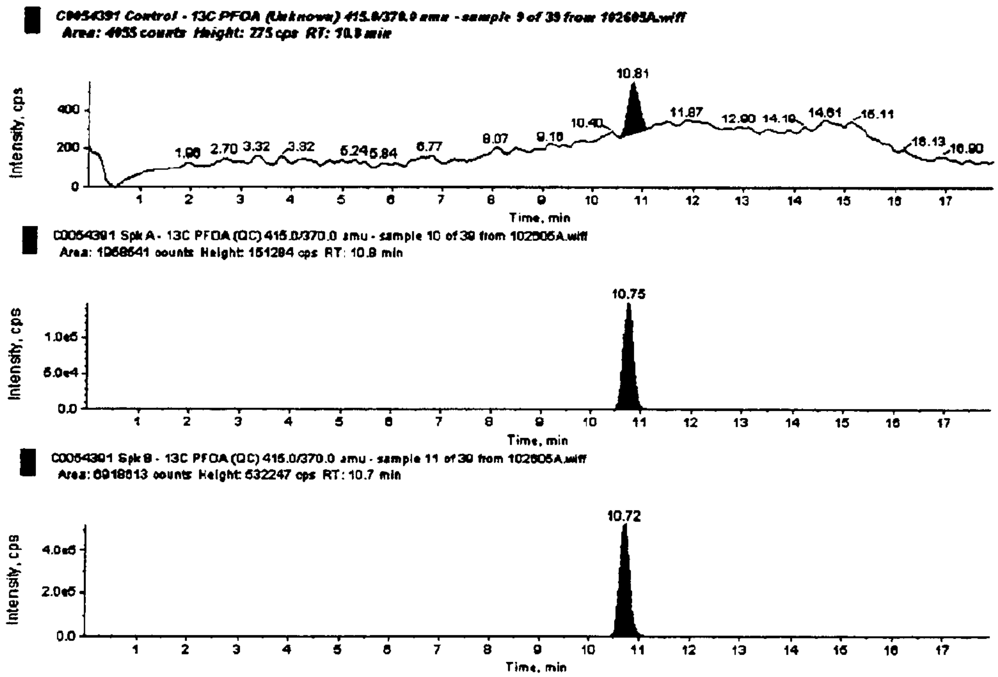
Figure 6. Non-Extracted Standards of ^{13}C PFOA in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively



3MA01552279

2095.0502

Figure 7. ^{13}C **PFOA in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively**



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2095.0503

Figure 8. Chromatogram Representing a Fish Sample Analyzed for ^{13}C PFOA (Exygen ID: C0096710, Data Set: 102605A)

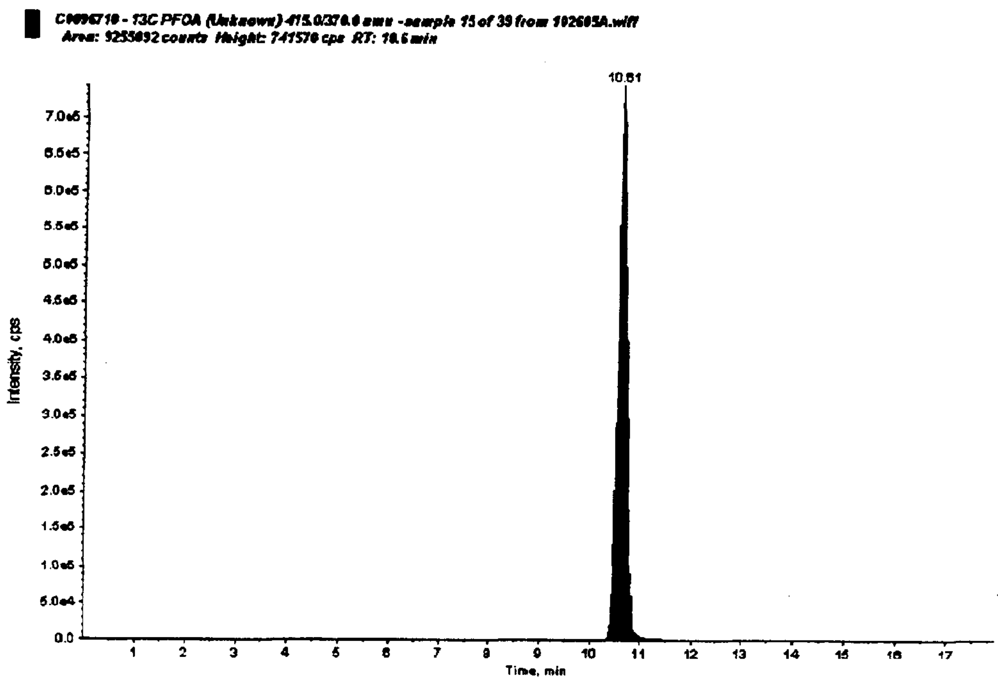


Figure 9. Typical Calibration Curve for PFBS in Methanol

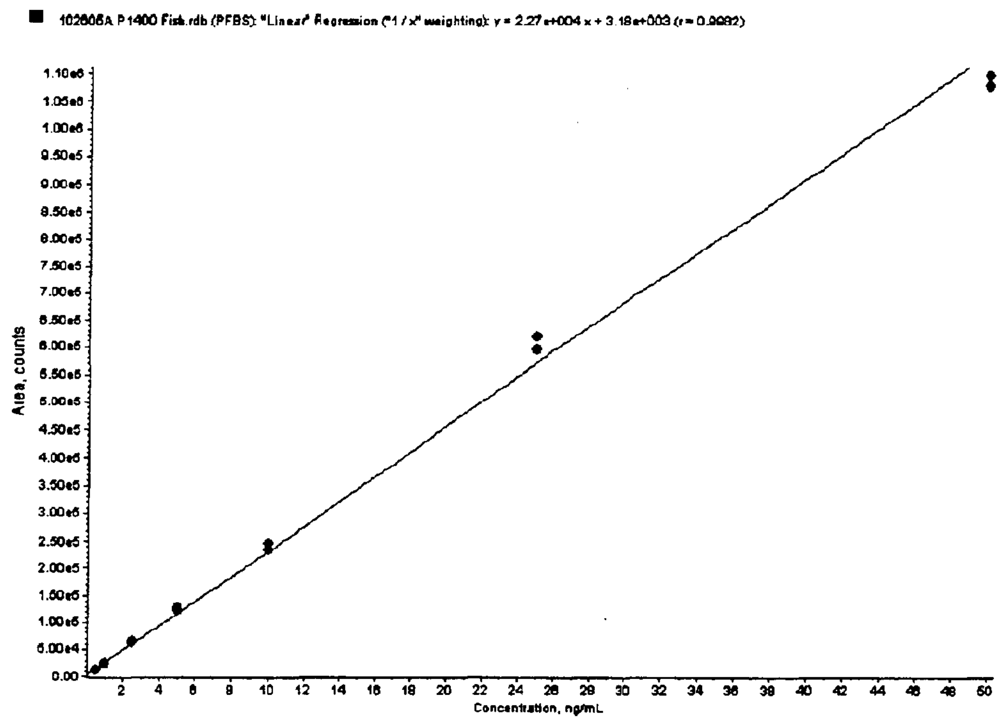
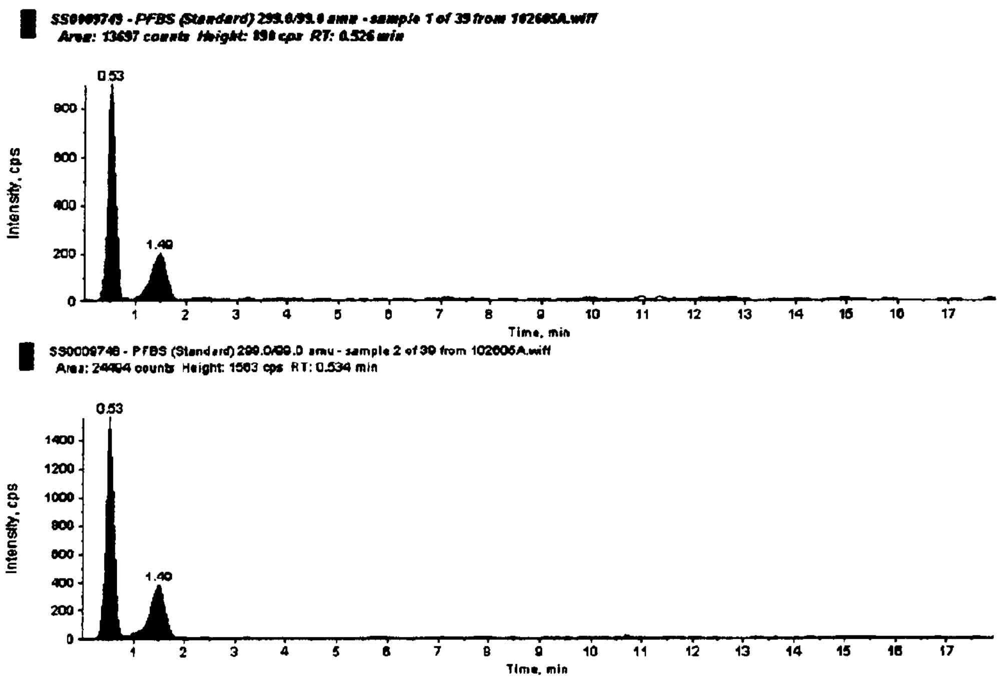


Figure 10. Non-Extracted Standards of PFBS in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively



3MA01552283

2095.0506

Figure 11. PFBS in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively

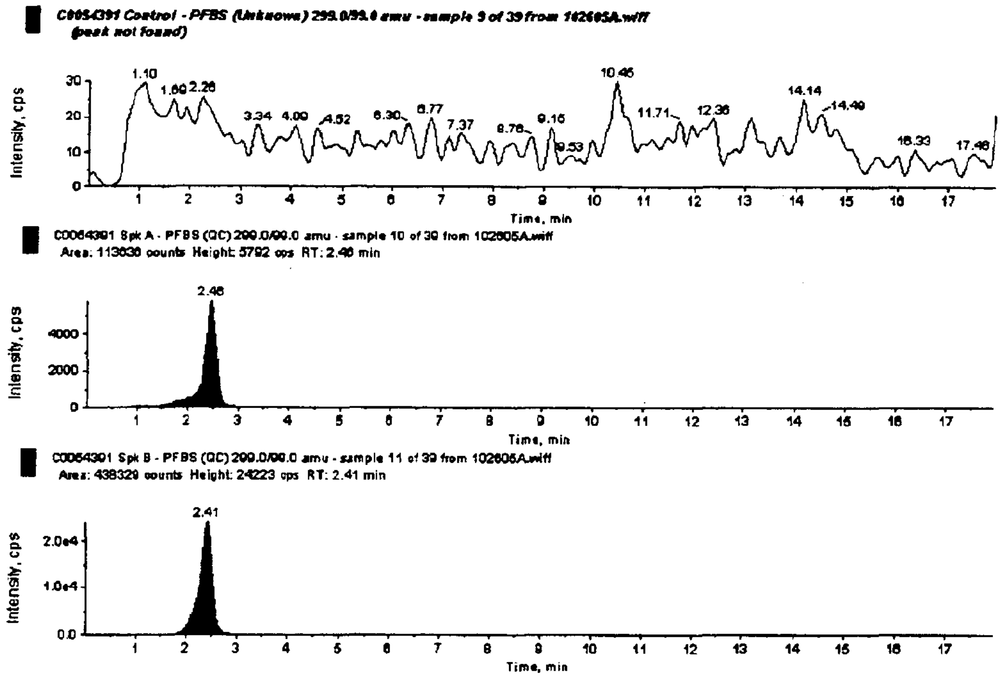
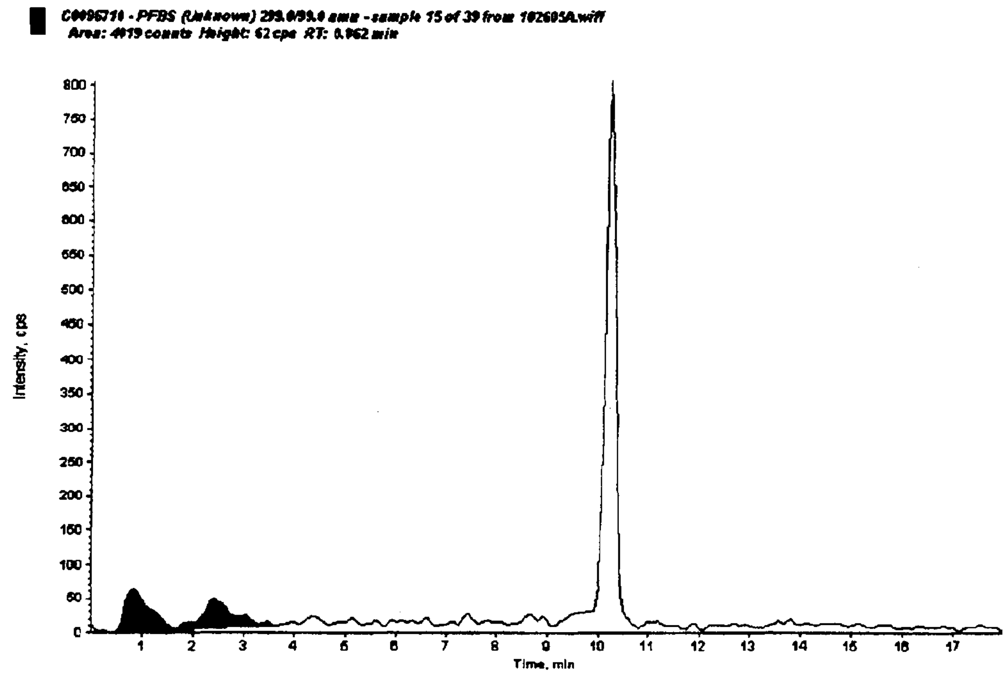


Figure 12. Chromatogram Representing a Fish Sample Analyzed for PFBS (Exygen ID: C0096710, Data Set: 102605A)



3MA01552285

2095.0508

Figure 13. Typical Calibration Curve for PFHS in Methanol

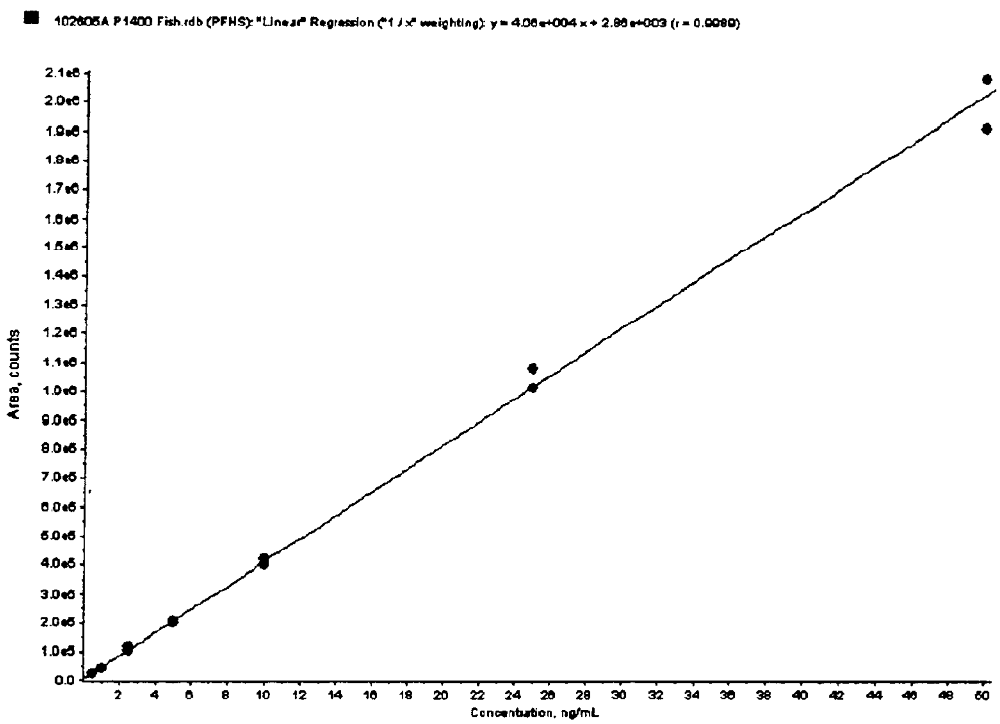


Figure 14. Non-Extracted Standards of PFHS in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively

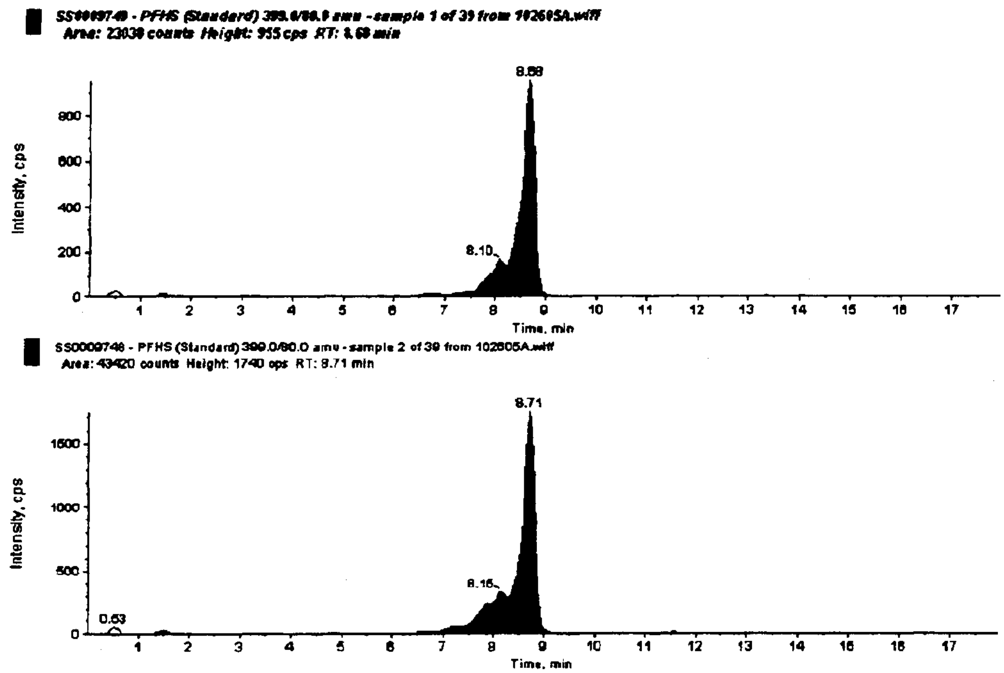
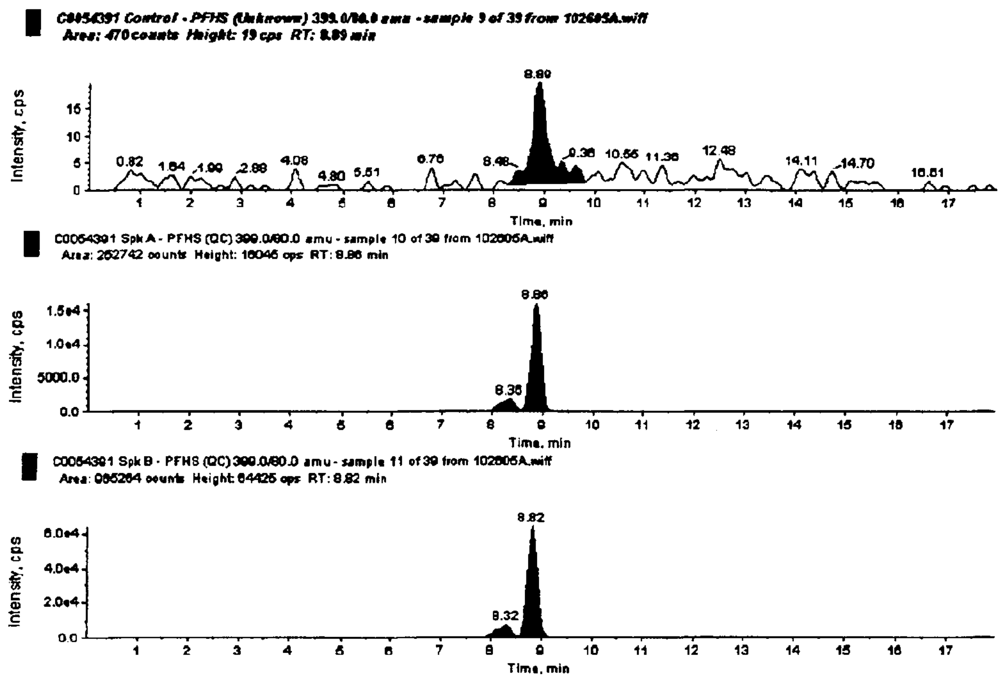


Figure 15. PFHS in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively



3MA01552288

2095.0511

Figure 16. Chromatogram Representing a Fish Sample Analyzed for PFHS (Exygen ID: C0096710, Data Set: 102605A)

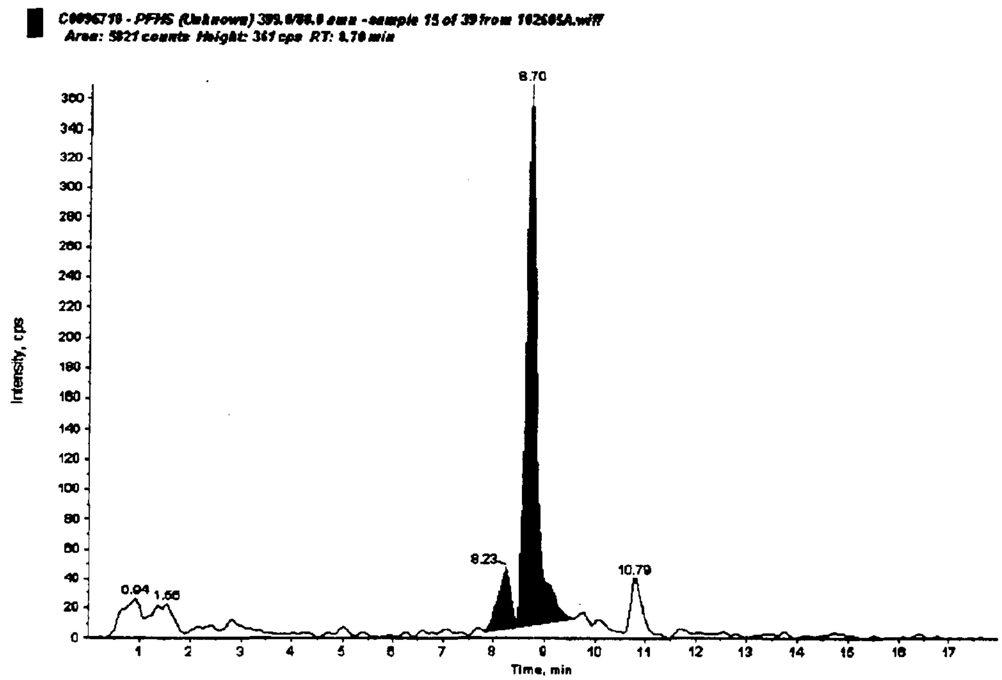


Figure 17. Typical Calibration Curve for PFOS in Methanol

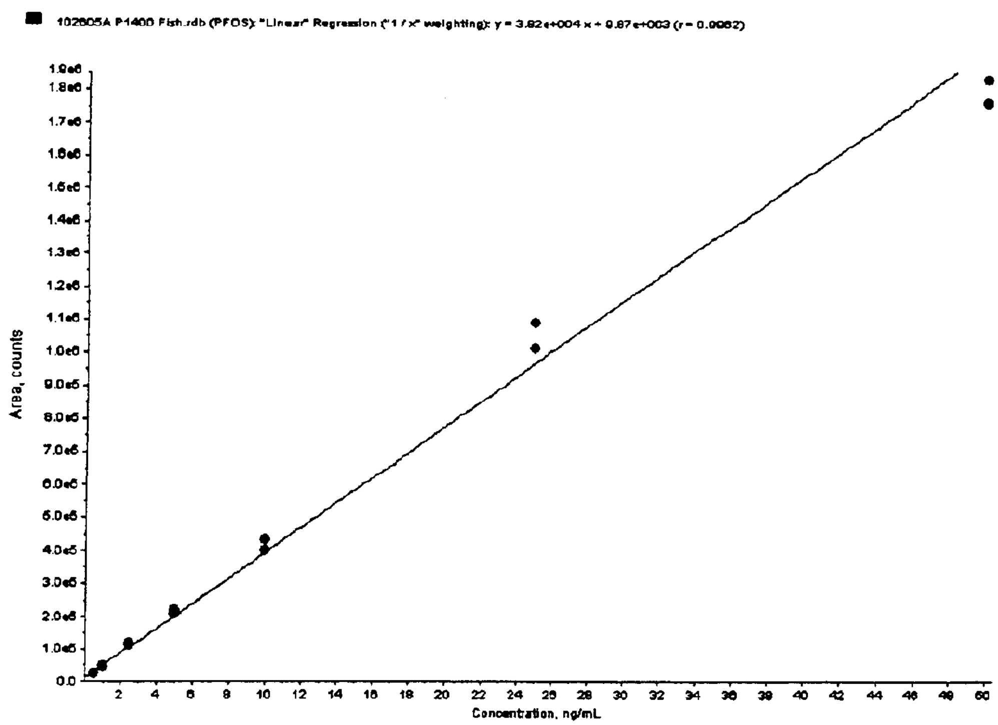
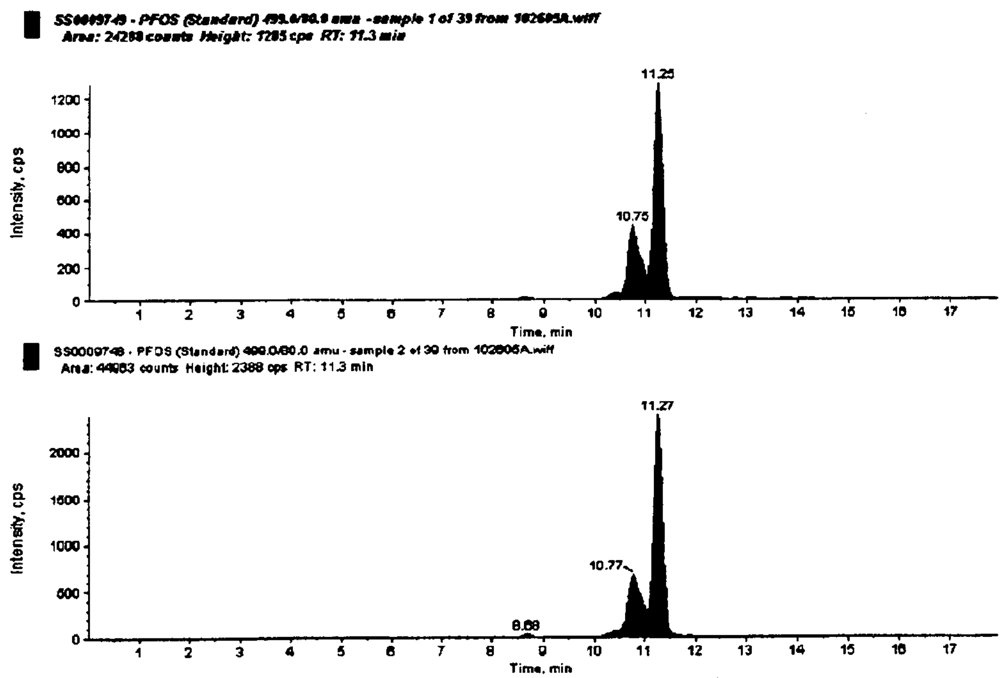


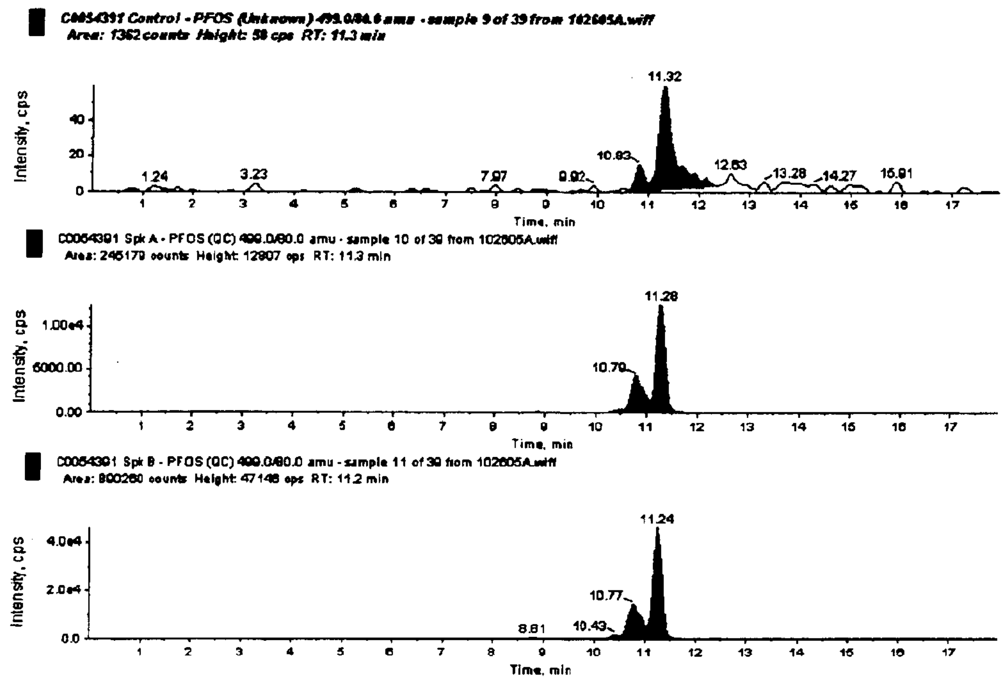
Figure 18. Non-Extracted Standards of PFOS in Methanol, 0.5 ng/mL and 1.0 ng/mL, Respectively



3MA01552291

2095.0514

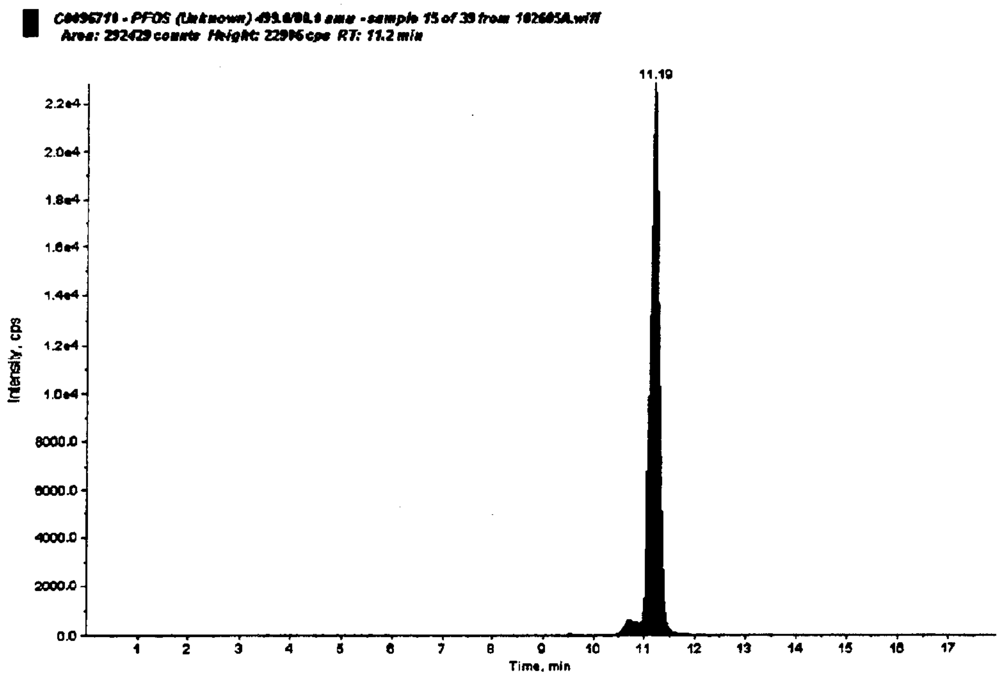
Figure 19. PFOS in Control Fish Blank, 2.5 ng/g Fortified Control Fish Spk A, and 10 ng/g Fortified Control Fish Spk B, Respectively



3MA01552292

2095.0515

Figure 20. Chromatogram Representing a Fish Sample Analyzed for PFOS (Exygen ID: C0096710, Data Set: 102605A)



SEVERN TRENT STL

STL Chicago
2417 Bond Street
University Park, IL 60466

Tel: 708 534 5200 Fax: 708 534 5211
www.stl-inc.com

SEVERN TRENT LABORATORIES ANALYTICAL REPORT

JOB NUMBER: 236865

Prepared For:

Weston Solutions, Inc.
1400 Weston Way
Building 5-2
West Chester, PA 19380-1499

Project: Confidential Client - Cottage Grove

Attention: Jai Kesari

Date: 06/13/2005

Signature

Name: Richard C. Wright

Title: Project Manager

E-Mail: rwright@stl-inc.com

6/13/05
Date

STL Chicago
2417 Bond Street
University Park, IL 60466

PHONE: (708) 534-5200
FAX..: (708) 534-5211

This Report Contains (35) Pages

STL Chicago
Wet Chemistry Case Narrative

Client: **Weston Solutions, Inc.**
Job #: **236865** Date Rec'd: 05/23/05

1. This narrative covers the analysis of the samples in the above Job # for reactive CN and sulfide, flash point, pH, and TOC by the methods cited on the Laboratory Test Results pages.

2. The analysis was done within the EPA holding times. Refer to the Laboratory Chronicle Page for dates of sampling, receipt, and analysis.

3. The method blanks were less than the reporting limits.

4. The LCS recoveries were within acceptance limits.

5. See the Quality Control Results page for details of all matrix QC and non-matrix QC.

Diane L. Harper
Diane L. Harper
Wet Chemistry Section Manager

6-3-05
Date

3MA01552295

Severn Trent Laboratories - Chicago
METALS CASE NARRATIVE

Client: Weston Solutions, Inc.
Project ID: Conf. – Cottage Grove
STL Job#: 236865

Date Recd: 05/23/05

1. This narrative covers the Metals analysis of samples received in the above STL Job 236865.

   Method Refs: USEPA, SW-846

2. All analyses were performed within the required holding times.
3. All Initial and Continuing Calibration Verification (ICV/CCV's) were within control limits.
4. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.
5. All Preparation/Method Blanks were less than the reporting limits.
6. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.
7. Laboratory Control Sample (LCS) recoveries were within the 80-120% control limits.
8. Matrix QC was performed on an alternate Job.

Jodi L. Gromala
Metals Section Manager

6-1-05
Date

3MA01552296

Severn Trent Laboratories Chicago
GC/MS Case Narrative

Weston Solutions
Confidential Client: Cottage Grove
Job Number: 236865
VOA DATA:

1. All samples were properly preserved and analyzed within the 14-day hold time from the date of collection.

2. All of the Method Blanks and Extraction Blank target compounds were below the reporting limits.

3. The LCS (Laboratory Control Sample) samples had all controlled spike recoveries within the in-house generated QC limits for the water and soil samples.

4. Matrix Spike/Matrix Spike Duplicate analyses were mot performed on this sample set.

5. All of the volatile samples had surrogate recoveries within the in-house generated QC limits.

6. The TCLP samples were prepared using Method 5030. All samples were analyzed following SW846 Method 8260B and 8000B. All calibration criteria are met per method or SOP (for minimum R values for certain compounds). The low point in the initial calibration verifies the base reporting limits. The target compounds were quantitated using the initial calibration.

7. All of the internal standard areas and retention times were within SOP acceptance limits as compared to the corresponding calibration verification standard.

8. The TCLP samples were analyzed using a 10.0-mL purge volume with a 1/20 dilution.

John Nagel
GC/MS Dept.

6-13-05
Date

3MA01552297

Severn Trent Services - Chicago
GC/MS BNA Case Narrative

Weston Solutions, Inc./Confidential Client – Cottage Grove
Job Number: 236865
BNA DATA: TCLP

1. All extractions and analyses were performed within recommended hold-times.

2. The MB (Method Blank) and the EB (TCLP blank) samples had all analytes undetected.

3. The LCS (Laboratory Control Sample) had the three control spike recoveries within the in-house QC limits.

4. A MS (Matrix Spike) was not performed.

5. All samples had all surrogate recoveries within the in-house QC limits.

6. All samples had all internal standard areas and retention times within the SOP acceptance limits as compared to the corresponding calibration verification standard.

7. All samples were extracted and analyzed following USEPA SW846 8270C protocol. The samples and the TCLP Blank was extracted using 100-mL of the TCLP leachate. The MB and the LCS were extracted using 1000-mL of deionized water. The results and reporting limits were adjusted for the extraction volumes.

Gary Rynkar
GC/MS Section Manager

6/7/13
Date

3MA01552298

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S A M P L E   I N F O R M A T I O N
Date: 06/13/2005

Job Number.: 236865
Customer...: Weston Solutions, Inc.
Attn.......: Jai Kesari

Project Number.........: 20005459
Customer Project ID....: CONF. - COTTAGE GROVE
Project Description....: Confidential Client - Cottage Grove

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
236865-1	C6MN SBC D201 0 0200	Soil	05/17/2005	11:30	05/23/2005	10:25
236865-2	C6MN SBC D104 0 0100	Soil	05/18/2005	09:45	05/23/2005	10:25
236865-3	C6MN SBC D104 0 0450	Soil	05/18/2005	11:20	05/23/2005	10:25
236865-4	C6MN SBC D103 0 0350	Soil	05/19/2005	08:35	05/23/2005	10:25
236865-5	C6MN SBC D103 0 0500	Soil	05/19/2005	09:30	05/23/2005	10:25
236865-6	C6MN D2005	Soil	05/17/2005	13:00	05/23/2005	10:25
236865-7	C6MN SBC D501 0 0150	Soil	05/20/2005	10:00	05/23/2005	10:25
236865-8	C6MN SBC D801 0 0050	Soil	05/20/2005	11:05	05/23/2005	10:25

Job Number: 236865

LABORATORY TEST RESULTS

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROV ATTN: Jai Kesari

Customer Sample ID: C6MN SBC D201 0 0200
Date Sampled......: 05/17/2005
Time Sampled......: 11:30
Sample Matrix.....: Soil

Laboratory Sample ID: 236865-1
Date Received.......: 05/23/2005
Time Received.......: 10:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	1400			62	270	1	mg/Kg	150758		05/27/05 1150	cls

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 236865

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROV ATTN: Jai Kesari

Customer Sample ID: C6MN SBC D104 0 0100
Date Sampled......: 05/18/2005
Time Sampled......: 09:45
Sample Matrix.....: Soil

Laboratory Sample ID: 236865-2
Date Received.......: 05/23/2005
Time Received.......: 10:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	350			54	230	1	mg/Kg	150758		05/27/05 1357	cls

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 236865

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc.   PROJECT: CONF. - COTTAGE GROV   ATTN: Jai Kesari

Customer Sample ID: C6MN SBC D104 0 0450
Date Sampled......: 05/18/2005
Time Sampled......: 11:20
Sample Matrix.....: Soil

Laboratory Sample ID: 236865-3
Date Received.......: 05/23/2005
Time Received.......: 10:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	310			49	210	1	mg/Kg	150758		05/27/05 1421	cls

* In Description = Dry Wgt.

3MA01552302

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LABORATORY TEST RESULTS

Job Number: 236865

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc.   PROJECT: CONF. - COTTAGE GROV   ATTN: Jai Kesari

Customer Sample ID: C6MN SBC D103 0 0350
Date Sampled......: 05/19/2005
Time Sampled......: 08:35
Sample Matrix.....: Soil

Laboratory Sample ID: 236865-4
Date Received.......: 05/23/2005
Time Received.......: 10:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	240			47	200	1	mg/Kg	150758		05/27/05 1441	cls

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 236865

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROV ATTN: Jai Kesari

Customer Sample ID: C6MN SBC D103 0 0500
Date Sampled......: 05/19/2005
Time Sampled......: 09:30
Sample Matrix.....: Soil

Laboratory Sample ID: 236865-5
Date Received.......: 05/23/2005
Time Received.......: 10:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	240			47	200	1	mg/Kg	150758		05/27/05 1502	cls

* In Description = Dry Wgt.

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L A B O R A T O R Y   T E S T   R E S U L T S

Job Number: 236865   Date:06/13/2005

CUSTOMER: Weston Solutions, Inc.   PROJECT: CONF. - COTTAGE GROV   ATTN: Jai Kesari

Customer Sample ID: C6MN D2005
Date Sampled......: 05/17/2005
Time Sampled......: 13:00
Sample Matrix.....: Soil

Laboratory Sample ID: 236865-6
Date Received.......: 05/23/2005
Time Received.......: 10:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
7.3.3.2/9014	Reactivity, Cyanide											
	Reactivity, Cyanide, Solid	2.3	U		2.3	2.3	1	mg/Kg	151121		05/26/05 1159	mtb
1010	Ignitability (Pensky-Martens Closed-Cup)											
	Ignitability (Flashpoint), Solid	>200					1	degrees F	150475		05/31/05 1244	jmk
9045C	pH (Soil)											
	Corrosivity (pH Solid), Solid	8.0			0.2	0.2	1	pH Units	150926			pmf
7.3.4.2/9034	Reactivity, Sulfide											
	Reactivity, Sulfide, Solid	230	U		8.1	230	1	mg/Kg	150183		05/27/05 0929	mtb
7470A	Leachable, Mercury (CVAA)											
	Mercury, TCLP Leach	0.0020	U		0.0020	0.0020	1	mg/L	150446		05/27/05 1538	gok
6010B	Leachable, Metals Analysis (ICAP)											
	Arsenic, TCLP Leach	0.10	U		0.010	0.10	1	mg/L	150181		05/26/05 1813	tds
	Barium, TCLP Leach	0.48	B		0.010	1.0	1	mg/L	150181		05/26/05 1813	tds
	Cadmium, TCLP Leach	0.050	U		0.002	0.050	1	mg/L	150181		05/26/05 1813	tds
	Chromium, TCLP Leach	0.050	U		0.010	0.050	1	mg/L	150181		05/26/05 1813	tds
	Lead, TCLP Leach	0.019	B		0.0050	0.050	1	mg/L	150181		05/26/05 1813	tds
	Selenium, TCLP Leach	0.10	U		0.010	0.10	1	mg/L	150181		05/26/05 1813	tds
	Silver, TCLP Leach	0.050	U		0.005	0.050	1	mg/L	150181		05/26/05 1813	tds
8270C	Semivolatile Organics											
	Pyridine, TCLP Leach	200	U		200	200	1.00000	ug/L	151188		06/06/05 1824	dpk
	1,4-Dichlorobenzene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1824	dpk
	2-Methylphenol (o-cresol), TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1824	dpk
	Hexachloroethane, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1824	dpk

* In Description = Dry Wgt.

Job Number: 236865

LABORATORY TEST RESULTS

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROV ATTN: Jai Kesari

Customer Sample ID: C6MN D2005
Date Sampled......: 05/17/2005
Time Sampled......: 13:00
Sample Matrix.....: Soil

Laboratory Sample ID: 236865-6
Date Received.......: 05/23/2005
Time Received.......: 10:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methylphenol (m/p-cresol), TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1824	dpk
	Nitrobenzene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1824	dpk
	Hexachlorobutadiene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1824	dpk
	2,4,6-Trichlorophenol, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1824	dpk
	2,4,5-Trichlorophenol, TCLP Leach	500	U		500	500	1.00000	ug/L	151188		06/06/05 1824	dpk
	2,4-Dinitrotoluene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1824	dpk
	Hexachlorobenzene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1824	dpk
	Pentachlorophenol, TCLP Leach	500	U		500	500	1.00000	ug/L	151188		06/06/05 1824	dpk
8260B	Volatile Organics											
	Vinyl chloride, TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn
	1,1-Dichloroethene, TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn
	2-Butanone (MEK), TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn
	Chloroform, TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn
	Carbon tetrachloride, TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn
	Benzene, TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn
	1,2-Dichloroethane, TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn
	Trichloroethene, TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn
	Tetrachloroethene, TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn
	Chlorobenzene, TCLP Leach	100	U		25	100	1.0000	ug/L	151453		06/09/05 0750	jdn

* In Description = Dry Wgt.

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L A B O R A T O R Y   T E S T   R E S U L T S

Job Number: 236865

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROV ATTN: Jai Kesari

Customer Sample ID: C6MN SBC D501 0 0150
Date Sampled......: 05/20/2005
Time Sampled......: 10:00
Sample Matrix.....: Soil

Laboratory Sample ID: 236865-7
Date Received.......: 05/23/2005
Time Received.......: 10:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	990			88	380	1	mg/Kg	150758		05/27/05 1536	cls

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 236865

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROV ATTN: Jai Kesari

Customer Sample ID: C6MN SBC D801 0 0050
Date Sampled......: 05/20/2005
Time Sampled......: 11:05
Sample Matrix.....: Soil

Laboratory Sample ID: 236865-8
Date Received.......: 05/23/2005
Time Received.......: 10:25

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	3100			130	550	1	mg/Kg	150758		05/27/05 1607	cls

* In Description = Dry Wgt.

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Job Number: 236865 — LABORATORY CHRONICLE — Date: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROV ATTN: Jai Kesari

Lab ID: 236865-1 Client ID: C6MN SBC D201 0 0200 — Date Recvd: 05/23/2005 Sample Date: 05/17/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
EDD	Electronic Data Deliverable	1					
Lloyd Kahn	Total Organic Carbon (Soils)	1	150758	150758	05/27/2005	1150	

Lab ID: 236865-2 Client ID: C6MN SBC D104 0 0100 — Date Recvd: 05/23/2005 Sample Date: 05/18/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	150758	150758	05/27/2005	1357	

Lab ID: 236865-3 Client ID: C6MN SBC D104 0 0450 — Date Recvd: 05/23/2005 Sample Date: 05/18/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	150758	150758	05/27/2005	1421	

Lab ID: 236865-4 Client ID: C6MN SBC D103 0 0350 — Date Recvd: 05/23/2005 Sample Date: 05/19/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	150758	150758	05/27/2005	1441	

Lab ID: 236865-5 Client ID: C6MN SBC D103 0 0500 — Date Recvd: 05/23/2005 Sample Date: 05/19/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	150758	150758	05/27/2005	1502	

Lab ID: 236865-6 Client ID: C6MN D2005 — Date Recvd: 05/23/2005 Sample Date: 05/17/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030CP TCLP/SPLP Prep	1	151302		06/07/2005	2046	
5030B	5030CP TCLP/SPLP Prep	2	151452		06/09/2005	0750	
3010A	Acid Dig. Leachates (ICAP)	1	149954	149796	05/25/2005	1820	
3510C	Extraction for TCLP (SVOC)	1	150294	149796	05/27/2005	1700	
3510C	Extraction for TCLP (SVOC)	2	150847	149796	06/03/2005	0700	
1010	Ignitability (Pensky-Martens Closed-Cup)	1	150475	150475	05/31/2005	1244	
7470A	Leachable, Mercury (CVAA)	1	150446	150444-149796	05/27/2005	1538	
6010B	Leachable, Metals Analysis (ICAP)	1	150181	149954-149796	05/26/2005	1813	
7.3.3.2/9014	Reactivity, Cyanide	1	151121	150073	05/26/2005	1159	
7.3.4.2/9034	Reactivity, Sulfide	1	150183	150183	05/27/2005	0929	
7470	SW846 Dig. Leachates (Hg)	1	150444		05/27/2005	1015	
8270C	Semivolatile Organics	1	151188	150847-149796	06/06/2005	1824	1.00000
1311	TCLP Extraction	1	149796		05/24/2005	1345	
1311	TCLP Zero Headspace Extraction	1	150105		05/26/2005	1400	
8260B	Volatile Organics	1	151453	151452-150105	06/09/2005	0750	1.0000
9045C	pH (Soil)	1	150926	150926			

Lab ID: 236865-7 Client ID: C6MN SBC D501 0 0150 — Date Recvd: 05/23/2005 Sample Date: 05/20/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	150758	150758	05/27/2005	1536	

Lab ID: 236865-8 Client ID: C6MN SBC D801 0 0050 — Date Recvd: 05/23/2005 Sample Date: 05/20/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	150758	150758	05/27/2005	1607	

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SURROGATE RECOVERIES REPORT

Job Number.: 236865

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN: Jai Kesari

Method........: Volatile Organics.
Method Code...: 8260B

Test Matrix...: TCLP Leach
Batch(s)......: 151453

Prep Batch..: 151452

Lab ID	DT	Sample ID	Date	12DCED	BRFLBE	DBRFLM	TOLD8
LCD			06/09/2005	104	100	95	95
LCS			06/08/2005	104	101	95	97
MB			06/08/2005	114	96	98	94
236865- 6		C6MN D2005	06/09/2005	106	95	98	94
236958--21 EB1			06/09/2005	108	91	100	96

Test	Test Description	Limits
12DCED	1,2-Dichloroethane-d4 (surr)	62 - 127
BRFLBE	4-Bromofluorobenzene (surr)	67 - 132
DBRFLM	Dibromofluoromethane (surr)	77 - 119
TOLD8	Toluene-d8 (surr)	81 - 126

STL Chicago is part of Severn Trent Laboratories, Inc.

S U R R O G A T E   R E C O V E R I E S   R E P O R T

Job Number.: 236865 Report Date.: 06/13/2005

CUSTOMER: 483648 PROJECT: CONF. - COTTAGE GROVE ATTN: Jai Kesari

Method........: Semivolatile Organics Test Matrix...: TCLP Leach Prep Batch..: 150847
Method Code...: 8270 Batch(s)......: 151188

Lab ID	DT	Sample ID	Date	246TBP	2FLUBP	2FLUPH	NITRD5	PHEND5	TERD14
EB1			06/06/2005	57	71	56	81	36	78
EB1			06/06/2005	57	68	53	79	35	80
EB2			06/06/2005	62	67	53	81	36	85
LCS			06/06/2005	63	82	57	87	38	94
MB			06/06/2005	59	75	62	85	40	88
236865- 6		C6MN D2005	06/06/2005	50	65	49	78	35	95

Test	Test Description	Limits
246TBP	2,4,6-Tribromophenol (surr)	29 - 126
2FLUBP	2-Fluorobiphenyl (surr)	34 - 112
2FLUPH	2-Fluorophenol (surr)	21 - 100
NITRD5	Nitrobenzene-d5 (surr)	38 - 113
PHEND5	Phenol-d5 (surr)	18 - 100
TERD14	Terphenyl-d14 (surr)	10 - 119

Job Number.: 236865

QUALITY CONTROL RESULTS

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.		PROJECT: CONF. - COTTAGE GROVE		ATTN: Jai Kesari	
QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date Time

Test Method........: 8270C
Method Description.: Semivolatile Organics
Equipment Code....: GCL10
Batch.............: 151188
Analyst...: dpk

EB1	Extraction Blank 1		150847-003		06/06/2005 1438

Parameter/Test Description	Units	QC Result		QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	200.000	U							
1,4-Dichlorobenzene, TCLP Leach	ug/L	100.000	U							
2-Methylphenol (o-cresol), TCLP Leach	ug/L	100.000	U							
Hexachloroethane, TCLP Leach	ug/L	100.000	U							
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	100.000	U							
Nitrobenzene, TCLP Leach	ug/L	100.000	U							
Hexachlorobutadiene, TCLP Leach	ug/L	100.000	U							
2,4,6-Trichlorophenol, TCLP Leach	ug/L	100.000	U							
2,4,5-Trichlorophenol, TCLP Leach	ug/L	500.000	U							
2,4-Dinitrotoluene, TCLP Leach	ug/L	100.000	U							
Hexachlorobenzene, TCLP Leach	ug/L	100.000	U							
Pentachlorophenol, TCLP Leach	ug/L	500.000	U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 236865	QUALITY CONTROL RESULTS	Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8270C
Method Description.: Semivolatile Organics
Equipment Code....: GCL10
Batch.............: 151188
Analyst...: dpk

EB1	Extraction Blank 1		150847-003		06/06/2005	1510

Parameter/Test Description	Units	QC Result		QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	200.000	U							
1,4-Dichlorobenzene, TCLP Leach	ug/L	100.000	U							
2-Methylphenol (o-cresol), TCLP Leach	ug/L	100.000	U							
Hexachloroethane, TCLP Leach	ug/L	100.000	U							
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	100.000	U							
Nitrobenzene, TCLP Leach	ug/L	100.000	U							
Hexachlorobutadiene, TCLP Leach	ug/L	100.000	U							
2,4,6-Trichlorophenol, TCLP Leach	ug/L	100.000	U							
2,4,5-Trichlorophenol, TCLP Leach	ug/L	500.000	U							
2,4-Dinitrotoluene, TCLP Leach	ug/L	100.000	U							
Hexachlorobenzene, TCLP Leach	ug/L	100.000	U							
Pentachlorophenol, TCLP Leach	ug/L	500.000	U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 236865	QUALITY CONTROL RESULTS	Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8270C
Method Description.: Semivolatile Organics
Equipment Code....: GCL10
Batch.............: 151188
Analyst...: dpk

EB2	Extraction Blank 2		150847-005		06/06/2005	1542

Parameter/Test Description	Units	QC Result		QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	200.000	U							
1,4-Dichlorobenzene, TCLP Leach	ug/L	100.000	U							
2-Methylphenol (o-cresol), TCLP Leach	ug/L	100.000	U							
Hexachloroethane, TCLP Leach	ug/L	100.000	U							
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	100.000	U							
Nitrobenzene, TCLP Leach	ug/L	100.000	U							
Hexachlorobutadiene, TCLP Leach	ug/L	100.000	U							
2,4,6-Trichlorophenol, TCLP Leach	ug/L	100.000	U							
2,4,5-Trichlorophenol, TCLP Leach	ug/L	500.000	U							
2,4-Dinitrotoluene, TCLP Leach	ug/L	100.000	U							
Hexachlorobenzene, TCLP Leach	ug/L	100.000	U							
Pentachlorophenol, TCLP Leach	ug/L	500.000	U							

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 236865

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
LCS	Laboratory Control Sample	05EWLMPCA	150847-002		06/06/2005	1406

Test Method........: 8270C
Method Description.: Semivolatile Organics

Equipment Code....: GCL10
Batch.............: 151188

Analyst...: dpk

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	63.016		100.000	20.000 U	63	%	16-100	
1,4-Dichlorobenzene, TCLP Leach	ug/L	78.093		100.000	10.000 U	78	%	38-100	
2-Methylphenol (o-cresol), TCLP Leach	ug/L	76.857		100.000	10.000 U	77	%	37-100	
Hexachloroethane, TCLP Leach	ug/L	72.158		100.000	10.000 U	72	%	34-100	
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	74.011		100.000	10.000 U	74	%	35-106	
Nitrobenzene, TCLP Leach	ug/L	79.886		100.000	10.000 U	80	%	41-105	
Hexachlorobutadiene, TCLP Leach	ug/L	62.966		100.000	10.000 U	63	%	41-100	
2,4,6-Trichlorophenol, TCLP Leach	ug/L	85.824		100.000	10.000 U	86	%	51-101	
2,4,5-Trichlorophenol, TCLP Leach	ug/L	82.419		100.000	50.000 U	82	%	54-107	
2,4-Dinitrotoluene, TCLP Leach	ug/L	85.191		100.000	10.000 U	85	%	56-115	
Hexachlorobenzene, TCLP Leach	ug/L	75.485		100.000	10.000 U	75	%	50-113	
Pentachlorophenol, TCLP Leach	ug/L	67.542		100.000	50.000 U	68	%	50-112	

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 236865	QUALITY CONTROL RESULTS	Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.	PROJECT: CONF. - COTTAGE GROVE	ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
MB	Method Blank		150847-001		06/06/2005	1335

Test Method........: 8270C
Method Description.: Semivolatile Organics
Equipment Code....: GCL10
Batch.............: 151188
Analyst...: dpk

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	20.000 U							
1,4-Dichlorobenzene, TCLP Leach	ug/L	10.000 U							
2-Methylphenol (o-cresol), TCLP Leach	ug/L	10.000 U							
Hexachloroethane, TCLP Leach	ug/L	10.000 U							
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	10.000 U							
Nitrobenzene, TCLP Leach	ug/L	10.000 U							
Hexachlorobutadiene, TCLP Leach	ug/L	10.000 U							
2,4,6-Trichlorophenol, TCLP Leach	ug/L	10.000 U							
2,4,5-Trichlorophenol, TCLP Leach	ug/L	50.000 U							
2,4-Dinitrotoluene, TCLP Leach	ug/L	10.000 U							
Hexachlorobenzene, TCLP Leach	ug/L	10.000 U							
Pentachlorophenol, TCLP Leach	ug/L	50.000 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 236865

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.		PROJECT: CONF. - COTTAGE GROVE		ATTN:	
QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date Time

Test Method........: 8260B
Method Description.: Volatile Organics
Equipment Code....: GCL16
Batch.............: 151453
Analyst...: jdn

EB1	Extraction Blank 1		151452-004		06/09/2005 0504

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Vinyl chloride, TCLP Leach	ug/L	100.000 U							
1,1-Dichloroethene, TCLP Leach	ug/L	100.000 U							
2-Butanone (MEK), TCLP Leach	ug/L	100.000 U							
Chloroform, TCLP Leach	ug/L	100.000 U							
Carbon tetrachloride, TCLP Leach	ug/L	100.000 U							
Benzene, TCLP Leach	ug/L	100.000 U							
1,2-Dichloroethane, TCLP Leach	ug/L	100.000 U							
Trichloroethene, TCLP Leach	ug/L	100.000 U							
Tetrachloroethene, TCLP Leach	ug/L	100.000 U							
Chlorobenzene, TCLP Leach	ug/L	100.000 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 236865

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
LCD	Laboratory Control Sample Duplicate	V05F08DSA	151452-003		06/09/2005	0814

Test Method........: 8260B
Method Description.: Volatile Organics

Equipment Code....: GCL16
Batch.............: 151453

Analyst...: jdn

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Vinyl chloride, TCLP Leach	ug/L	440.306	430.582	500.000	100.000 U	88	%	52-134	
						2	R	20	
1,1-Dichloroethene, TCLP Leach	ug/L	604.904	596.438	500.000	100.000 U	121	%	51-136	
						1	R	20	
2-Butanone (MEK), TCLP Leach	ug/L	409.448	418.416	500.000	100.000 U	82	%	29-139	
						2	R	20	
Chloroform, TCLP Leach	ug/L	510.036	502.236	500.000	100.000 U	102	%	75-122	
						2	R	20	
Carbon tetrachloride, TCLP Leach	ug/L	541.028	536.628	500.000	100.000 U	108	%	64-132	
						1	R	20	
Benzene, TCLP Leach	ug/L	454.428	456.948	500.000	100.000 U	91	%	75-122	
						1	R	20	
1,2-Dichloroethane, TCLP Leach	ug/L	533.606	530.044	500.000	100.000 U	107	%	67-120	
						1	R	20	
Trichloroethene, TCLP Leach	ug/L	506.326	499.046	500.000	100.000 U	101	%	75-124	
						1	R	20	
Tetrachloroethene, TCLP Leach	ug/L	464.208	477.414	500.000	100.000 U	93	%	70-125	
						3	R	20	
Chlorobenzene, TCLP Leach	ug/L	455.818	463.848	500.000	100.000 U	91	%	76-116	
						2	R	20	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS	
Job Number.: 236865	Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8260B
Method Description.: Volatile Organics
Equipment Code....: GCL16
Batch.............: 151453
Analyst...: jdn

LCS	Laboratory Control Sample	V05F08DSA	151452-002		06/08/2005	2219

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Vinyl chloride, TCLP Leach	ug/L	430.582		500.000	100.000 U	86	%	52-134	
1,1-Dichloroethene, TCLP Leach	ug/L	596.438		500.000	100.000 U	119	%	51-136	
2-Butanone (MEK), TCLP Leach	ug/L	418.416		500.000	100.000 U	84	%	29-139	
Chloroform, TCLP Leach	ug/L	502.236		500.000	100.000 U	100	%	75-122	
Carbon tetrachloride, TCLP Leach	ug/L	536.628		500.000	100.000 U	107	%	64-132	
Benzene, TCLP Leach	ug/L	456.948		500.000	100.000 U	91	%	75-122	
1,2-Dichloroethane, TCLP Leach	ug/L	530.044		500.000	100.000 U	106	%	67-120	
Trichloroethene, TCLP Leach	ug/L	499.046		500.000	100.000 U	100	%	75-124	
Tetrachloroethene, TCLP Leach	ug/L	477.414		500.000	100.000 U	95	%	70-125	
Chlorobenzene, TCLP Leach	ug/L	463.848		500.000	100.000 U	93	%	76-116	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 236865

QUALITY CONTROL RESULTS

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8260B
Method Description.: Volatile Organics
Equipment Code....: GCL16
Batch.............: 151453
Analyst...: jdn

MB	Method Blank		151452-001		06/08/2005	2155

Parameter/Test Description	Units	QC Result		QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Vinyl chloride, TCLP Leach	ug/L	100.000	U							
1,1-Dichloroethene, TCLP Leach	ug/L	100.000	U							
2-Butanone (MEK), TCLP Leach	ug/L	100.000	U							
Chloroform, TCLP Leach	ug/L	100.000	U							
Carbon tetrachloride, TCLP Leach	ug/L	100.000	U							
Benzene, TCLP Leach	ug/L	100.000	U							
1,2-Dichloroethane, TCLP Leach	ug/L	100.000	U							
Trichloroethene, TCLP Leach	ug/L	100.000	U							
Tetrachloroethene, TCLP Leach	ug/L	100.000	U							
Chlorobenzene, TCLP Leach	ug/L	100.000	U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS		
Job Number.: 236865		Report Date.: 06/13/2005
CUSTOMER: Weston Solutions, Inc.	PROJECT: CONF. - COTTAGE GROVE	ATTN: Jai Kesari

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP4
Batch.............: 150181
Analyst...: tds

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
EB1	Extraction Blank 1	149954	149954-001		05/26/2005	1509

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Arsenic, TCLP Leach	mg/L	0.01000 U							
Barium, TCLP Leach	mg/L	0.01000 U							
Cadmium, TCLP Leach	mg/L	0.00200 U							
Chromium, TCLP Leach	mg/L	0.01000 U							
Lead, TCLP Leach	mg/L	0.00500 U							
Selenium, TCLP Leach	mg/L	0.01000 U							
Silver, TCLP Leach	mg/L	0.00500 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 236865

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP4
Batch.............: 150181
Analyst...: tds

EB2	Extraction Blank 2		149954-002		05/26/2005	1515

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Arsenic, TCLP Leach	mg/L	0.01000 U							
Barium, TCLP Leach	mg/L	0.01000 U							
Cadmium, TCLP Leach	mg/L	0.00200 U							
Chromium, TCLP Leach	mg/L	0.01000 U							
Lead, TCLP Leach	mg/L	0.00500 U							
Selenium, TCLP Leach	mg/L	0.01000 U							
Silver, TCLP Leach	mg/L	0.00500 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Q U A L I T Y   C O N T R O L   R E S U L T S

Job Number.: 236865

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP4
Batch.............: 150181
Analyst...: tds

LCS	Laboratory Control Sample	M05ESPK002	149954-003		05/26/2005	1521

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Arsenic, TCLP Leach	mg/L	0.10135		0.10000		101	%	80-120	
Barium, TCLP Leach	mg/L	1.91758		2.00000		96	%	80-120	
Cadmium, TCLP Leach	mg/L	0.05023		0.05000		100	%	80-120	
Chromium, TCLP Leach	mg/L	0.19717		0.20000		99	%	80-120	
Lead, TCLP Leach	mg/L	0.10452		0.10000		105	%	80-120	
Selenium, TCLP Leach	mg/L	0.09543 B		0.10000		95	%	80-120	
Silver, TCLP Leach	mg/L	0.04579 B		0.05000		92	%	80-120	

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 236865 | Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. | PROJECT: CONF. - COTTAGE GROVE | ATTN: Jai Kesari

Test Method........: 7.3.3.2/9014
Method Description.: Reactivity, Cyanide
Parameter..........: Reactivity, Cyanide
Batch.............: 151121
Equipment Code....: SPEC4
Analyst...: mtb
Test Code.: REACCN

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
MB	150073-004		mg/L	0.01000 U								05/26/2005	1156
LCS	150073-005	I05BSTCN2	mg/L	0.09190		0.10000	0.01000 U	92		%	85-115	05/26/2005	1157

Test Method........: Lloyd Kahn
Method Description.: Total Organic Carbon (Soils)
Parameter..........: Organic Carbon, Tot. (TOC)
Batch.............: 150758
Equipment Code....: TOC4
Analyst...: cls
Test Code.: TOC

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
MB	150758-003		mg/Kg	29.00 U								05/27/2005	0821

Test Method........: Lloyd Kahn
Method Description.: Total Organic Carbon (Soils)
Parameter..........: TOC Average Duplicates
Batch.............: 150758
Equipment Code....: TOC4
Analyst...: cls
Test Code.: TOCAV2

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
LCS	150758-004	I00FSTLK3	mg/Kg	5441.74		4780.00		114		%	53-140	05/27/2005	0852

Test Method........: 9045C
Method Description.: pH (Soil)
Parameter..........: Corrosivity (pH Solid)
Batch.............: 150926
Equipment Code....:
Analyst...: pmf
Test Code.: CORSOL

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
PH	236865-6		pH Units	7.98000			7.99000	0.01000		A	0.20000		

Test Method........: 9045C
Method Description.: pH (Soil)
Parameter..........: pH
Batch.............: 150926
Equipment Code....:
Analyst...: pmf
Test Code.: PH

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
PH	236865-6		pH Units	7.98000			7.99000	0.01000		A	0.20000		
SP	150926-002	I05EPH7B	pH Units	7.00000		7.00000		0.00		A	0.20000		
SP	150926-003	I05EPH7B	pH Units	6.98000		7.00000		0.02000		A	0.20000		

Test Method........: 7.3.4.2/9034
Method Description.: Reactivity, Sulfide
Parameter..........: Reactivity, Sulfide
Batch.............: 150183
Equipment Code....:
Analyst...: mtb
Test Code.: REACS

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
	150183-001		mg/Kg	8.80 U								05/27/2005	0905
S	150183-002	I05BSTSF1A	mg/Kg	139.03 B		185.60	8.80 U	75		%	25-116	05/27/2005	0907

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 236865

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONF. - COTTAGE GROVE ATTN: Jai Kesari

Test Method........: 7470A
Method Description.: Leachable, Mercury (CVAA)
Parameter..........: Mercury

Batch..............: 150446
Equipment Code.....: HG4

Analyst...: gok
Test Code.: HG

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
MB	150293-007		ug/L	0.20 U								05/27/2005	1331
LCS	150293-008	M04LSTK010	ug/L	1.95		2.00	0.20 U	98		%	80-120	05/27/2005	1333
EB1	150293-009	784	mg/L	0.00200 U								05/27/2005	1335
EB1	150293-024	786	mg/L	0.00200 U								05/27/2005	1415
MB	150444-007		ug/L	0.20 U								05/27/2005	1439
LCS	150444-008	M04LSTK010	ug/L	1.87		2.00	0.20 U	94		%	80-120	05/27/2005	1441
EB1	150444-009	776	mg/L	0.00200 U								05/27/2005	1443
EB1	150444-011	781	mg/L	0.00200 U								05/27/2005	1447
EB2	150444-012	781	mg/L	0.00200 U								05/27/2005	1450
EB3	150444-031	785	mg/L	0.00200 U								05/27/2005	1540

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

REPORT COMMENTS

1) All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.
2) Soil, sediment and sludge sample results are reported on a "dry weight" basis except when analyzed for landfill disposal or incineration parameters. All other solid matrix samples are reported on an "as received" basis unless noted differently.
3) Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.
4) The test results for the noted analytical method(s) meet the requirements of NELAC. Lab Cert. ID# 100201
5) According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH Field) they were not analyzed immediately, but as soon as possible on laboratory receipt.

Glossary of flags, qualifiers and abbreviations (any number of which may appear in the report)

Inorganic Qualifiers (Q-Column)

U Analyte was not detected at or above the stated limit.
< Not detected at or above the reporting limit.
J Result is less than the RL, but greater than or equal to the method detection limit.
B Result is less than the CRDL/RL, but greater than or equal to the IDL/MDL.
S Result was determined by the Method of Standard Additions.
F AFCEE: Result is less than the RL, but greater than or equal to the method detection limit.

Inorganic Flags (Flag Column)

^ ICV,CCV,ICB,CCB,ISA,ISB,CRI,CRA,MRL: Instrument related QC exceed the upper or lower control limits.
* LCS, LCD, MD: Batch QC exceeds the upper or lower control limits.
+ MSA correlation coefficient is less than 0.995.
4 MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
E SD: Serial dilution exceeds the control limits.
H MB, EB1, EB2, EB3: Batch QC is greater than reporting limit or had a negative instrument reading lower than the absolute value of the reporting limit.
N MS, MSD: Spike recovery exceeds the upper or lower control limits.
W AS(GFAA) Post-digestion spike was outside 85-115% control limits.

Organic Qualifiers (Q - Column)

U Analyte was not detected at or above the stated limit.
ND Compound not detected.
J Result is an estimated value below the reporting limit or a tentatively identified compound (TIC).
Q Result was qualitatively confirmed, but not quantified.
C Pesticide identification was confirmed by GC/MS.
Y The chromatographic response resembles a typical fuel pattern.
Z The chromatographic response does not resemble a typical fuel pattern.
E Result exceeded calibration range, secondary dilution required.
F AFCEE:Result is an estimated value below the reporting limit or a tentatively identified compound (TIC)

Organic Flags (Flags Column)

B MB: Batch QC is greater than reporting limit.
* LCS, LCD, ELC, ELD, CV, MS, MSD, Surrogate: Batch QC exceeds the upper or lower control limits.
^ EB1, EB2, EB3, MLE: Batch QC is greater than reporting Limit
A Concentration exceeds the instrument calibration range
a Concentration is below the method Reporting Limit (RL)
B Compound was found in the blank and sample.
D Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution will be flagged with a D.
H Alternate peak selection upon analytical review
I Indicates the presence of an interfence, recovery is not calculated.
M Manually integrated compound.
P The lower of the two values is reported when the % difference between the results of two GC columns is

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greater than 25%.

Abbreviations

AS	Post Digestion Spike (GFAA Samples - See Note 1 below)
Batch	Designation given to identify a specific extraction, digestion, preparation set, or analysis set
CAP	Capillary Column CCB Continuing Calibration Blank
CCV	Continuing Calibration Verification
CF	Confirmation analysis of original
C1	Confirmation analysis of A1 or D1
C2	Confirmation analysis of A2 or D2
C3	Confirmation analysis of A3 or D3
CRA	Low Level Standard Check - GFAA; Mercury
CRI	Low Level Standard Check - ICP
CV	Calilbration Verification Standard
Dil Fac	Dilution Factor - Secondary dilution analysis
D1	Dilution 1
D2	Dilution 2
D3	Dilution 3
DLFac	Detection Limit Factor
DSH	Distilled Standard - High Level
DSL	Distilled Standard - Low Level
DSM	Distilled Standard - Medium Level
EB1	Extraction Blank 1
EB2	Extraction Blank 2
EB3	DI Blank
ELC	Method Extracted LCS
ELD	Method Extracted LCD
ICAL	Initial calibration
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
IDL	Instrument Detection Limit
ISA	Interference Check Sample A - ICAP
ISB	Interference Check Sample B - ICAP
Job No.	The first six digits of the sample ID which refers to a specific client, project and sample group
	Lab ID An 8 number unique laboratory identification
LCD	Laboratory Control Standard Duplicate
LCS	Laboratory Control Standard with reagent grade water or a matrix free from the analyte of interest
MB	Method Blank or (PB) Preparation Blank
MD	Method Duplicate
MDL	Method Detection Limit
MLE	Medium Level Extraction Blank
MRL	Method Reporting Limit Standard
MSA	Method of Standard Additions
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ND	Not Detected
PREPF	Preparation factor used by the Laboratory's Information Management System (LIMS)
PDS	Post Digestion Spike (ICAP)
RA	Re-analysis of original
A1	Re-analysis of D1
A2	Re-analysis of D2
A3	Re-analysis of D3
RD	Re-extraction of dilution
RE	Re-extraction of original
RC	Re-extraction Confirmation
RL	Reporting Limit
RPD	Relative Percent Difference of duplicate (unrounded) analyses
RRF	Relative Response Factor
RT	Retention Time

QUALITY ASSURANCE METHODS

REFERENCES AND NOTES

Report Date: 06/13/2005

RTW	Retention Time Window Sample ID A 9 digit number unique for each sample, the first six digits are referred as the job number
SCB	Seeded Control Blank
SD	Serial Dilution (Calculated when sample concentration exceeds 50 times the MDL)
UCB	Unseeded Control Blank
SSV	Second Source Verification Standard
SLCS	Solid Laboratory Control Standard(LCS)
PHC	pH Calibration Check LCSP pH Laboratory Control Sample
LCDP	pH Laboratory Control Sample Duplicate
MDPH	pH Sample Duplicate
MDFP	Flashpoint Sample Duplicate
LCFP	Flashpoint LCS
G1	Gelex Check Standard Range 0-1
G2	Gelex Check Standard Range 1-10
G3	Gelex Check Standard Range 10-100
G4	Gelex Check Standard Range 100-1000

Note 1: The Post Spike Designation on Batch QC for GFAA is designated with an "S" added to the current abbreviation used. EX. LCS S=LCS Post Spike (GFAA); MSS=MS Post Spike (GFAA)

Note 2: The MD calculates an absolute difference (A) when the sample concentration is less than 5 times the reporting limit. The control limit is represented as +/- the RL.

SEVERN TRENT **STL**

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Contact: TIM FRINAK
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Address: 1625 PUMPHREY AVE
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E-Mail: T. FRINAK@westonsolutions.com

Bill To:
Contact: PATTI ZONETTI
Company: WESTON SOLUTIONS
Address: 1400 WESTON WAY 5-2
WEST CHESTER PA 19380
Phone: 610-701-4524
Fax: 610-701-7401
PO#: Quote:

Shaded Areas For Internal Use Only ____ of ____

Lab Lot# 236865

Package Sealed: Yes No — Yes
Samples Sealed: Yes No — No
Received on Ice: Yes No — Yes
Samples Intact: Yes No — Yes
Temperature °C of Cooler: 18.0, 15.0, 15.0
Within Hold Time: Yes No — Yes
Preserv. Indicated: Yes No NA — NA
pH Check OK: Yes No NA — NA
Res Cl_2 Check OK: Yes No NA — NA
Sample Labels and COC Agree: Yes No COC not present — Yes

Sampler Name: ETHAN CALDWELL
Signature: [signature]
Project Name: Cottage Grove
Project Number: 02181.002.010.0001
Project Location:
Date Required — Hard Copy: __/__/__ Fax: __/__/__
Lab PM:

Refrig # / # / Cont. / Volume / Preserv.

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	TOC	waste analysis	Additional Analyses / Remarks
1		CGMN SBC D201 0 0200	5/17	1130	S	C	X		
2		CGMN SBC D104 0 0100	5/16	0945	S	C	X		
3		CGMN SBC D104 0 0450	5/16	1120	S	C	X		
4		CGMN SBC D103 0 0350	5/19	~~0935~~ 0835	S	C	X		
5		CGMN SBC D103 00500	5/19	0930	S	C	X		
6		CGMN D2005	5/17	1300	S	C		X	
7		CGMN SBC D501 0 0150	5/20	1000	S	C	X		
8		CGMN SBC D801 0 0050	5/20	1105	S	C	X		

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	WESTON	5/20/05	1300	FEDEX			
				[signature]	STL	5/23/05	1025

COMMENTS

Date Received: 5/23/05
Courier: FX
Hand Delivered ☐
Bill of Lading

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = ________

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other ________

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

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SEVERN TRENT STL

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SEVERN TRENT LABORATORIES ANALYTICAL REPORT

JOB NUMBER: 237037

Prepared For:

Weston Solutions, Inc.
1400 Weston Way
Building 5-2
West Chester, PA 19380-1499

Project: Confidential Client - Cottage Grove

Attention: Jai Kesari

Date: 06/13/2005

Signature

Date 6/13/05

Name: Richard C. Wright

Title: Project Manager

E-Mail: rwright@stl-inc.com

STL Chicago
2417 Bond Street
University Park, IL 60466

PHONE: (708) 534-5200
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This Report Contains (36) Pages

STL Chicago
Wet Chemistry Case Narrative

Client: **Weston Solutions, Inc.**
Job #: **237037** Date Rec'd: 05/27/05

1. This narrative covers the analysis of the samples in the above Job # for CN, reactive sulfide, flash point, pH, and TOC by the methods cited on the Laboratory Test Results pages.
2. The analysis was done within the EPA holding times. Refer to the Laboratory Chronicle Page for dates of sampling, receipt, and analysis.
3. The method blanks were less than the reporting limits.
4. The LCS recoveries were within acceptance limits.
5. The reactive sulfide MS and MSD recoveries were low. See the Quality Control Results page for details of all matrix QC and non-matrix QC.

Diane L. Harper
Diane L. Harper
Wet Chemistry Section Manager

6-8-05
Date

3MA01552331

Severn Trent Laboratories - Chicago
METALS CASE NARRATIVE

Client: Weston Solutions, Inc.
Project ID: Confidential Client
STL Job#: 237037

Date Recd: 05/27/05

1. This narrative covers the Metals analysis of samples received in the above STL Job 237037.

   Method Refs: USEPA, SW-846

2. All analyses were performed within the required holding times.

3. All Initial and Continuing Calibration Verification (ICV/CCV's) were within control limits.

4. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.

5. All Preparation/Method Blanks were less than the reporting limits.

6. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.

7. Laboratory Control Sample (LCS) recoveries were within the 80-120% control limits.

8. Matrix QC was performed on an alternate Job.

Jodi L. Gromala
Metals Section Manager

6-3-05
Date

3MA01552332

Severn Trent Laboratories Chicago
GC/MS Case Narrative

Weston Solutions
Confidential Client: Cottage Grove
Job Number: 237037
VOA DATA:

1. All samples were properly preserved and analyzed within the 14-day hold time from the date of collection.

2. All of the Method Blanks and Extraction Blank target compounds were below the reporting limits.

3. The LCS (Laboratory Control Sample) samples had all controlled spike recoveries within the in-house generated QC limits for the water and soil samples.

4. Matrix Spike/Matrix Spike Duplicate analyses were mot performed on this sample set.

5. All of the volatile samples had surrogate recoveries within the in-house generated QC limits.

6. The TCLP samples were prepared using Method 5030. All samples were analyzed following SW846 Method 8260B and 8000B. All calibration criteria are met per method or SOP (for minimum R values for certain compounds). The low point in the initial calibration verifies the base reporting limits. The target compounds were quantitated using the initial calibration.

7. All of the internal standard areas and retention times were within SOP acceptance limits as compared to the corresponding calibration verification standard.

8. The TCLP samples were analyzed using a 10.0-mL purge volume with a 1/20 dilution.

John Nagel
GC/MS Dept.

6-1-05
Date

3MA01552333

Severn Trent Services - Chicago
GC/MS BNA Case Narrative

Weston Solutions, Inc./Confidential Client – Cottage Grove
Job Number: 237037
BNA DATA: TCLP

1. All extractions and analyses were performed within recommended hold-times.
2. The MB (Method Blank) and the EB (TCLP blank) samples had all analytes undetected.
3. The LCS (Laboratory Control Sample) had the three control spike recoveries within the in-house QC limits.
4. A MS (Matrix Spike) was not performed.
5. All samples had all surrogate recoveries within the in-house QC limits.
6. All samples had all internal standard areas and retention times within the SOP acceptance limits as compared to the corresponding calibration verification standard.
7. All samples were extracted and analyzed following USEPA SW846 8270C protocol. The samples and the TCLP Blank was extracted using 100-mL of the TCLP leachate. The MB and the LCS were extracted using 1000-mL of deionized water. The results and reporting limits were adjusted for the extraction volumes.

David P. Kozubal
GC/MS Dept.

06/10/05
Date

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SAMPLE INFORMATION
Date: 06/13/2005

Job Number.: 237037
Customer...: Weston Solutions, Inc.
Attn.......: Jai Kesari

Project Number.........: 20005459
Customer Project ID....: CONFIDENTIAL CLIENT
Project Description....: Confidential Client - Cottage Grove

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
237037-1	CGMN SBC FTA02 00150	Soil	05/23/2005	13:40	05/27/2005	08:45
237037-2	CGMN SBC D101 00200	Soil	05/24/2005	13:40	05/27/2005	08:45
237037-3	CGMN SBC WPA01 00150	Soil	05/25/2005	09:40	05/27/2005	08:45
237037-4	CGMN SBC BKG01 00000	Soil	05/25/2005	10:40	05/27/2005	08:45
237037-5	CGMN SBC B1501 00100	Soil	05/25/2005	12:50	05/27/2005	08:45
237037-6	CGMN WASTE #2	Soil	05/26/2005	10:30	05/27/2005	08:45

LABORATORY TEST RESULTS

Job Number: 237037

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Customer Sample ID: CGMN SBC FTA02 00150
Date Sampled......: 05/23/2005
Time Sampled......: 13:40
Sample Matrix.....: Soil

Laboratory Sample ID: 237037-1
Date Received.......: 05/27/2005
Time Received.......: 08:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	5700			90	390	1	mg/Kg	151124		06/02/05 1144	cls

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 237037

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Customer Sample ID: CGMN SBC D101 00200
Date Sampled......: 05/24/2005
Time Sampled......: 13:40
Sample Matrix.....: Soil

Laboratory Sample ID: 237037-2
Date Received.......: 05/27/2005
Time Received.......: 08:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	380			66	280	1	mg/Kg	151124		06/02/05 1209	cls

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 237037

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Customer Sample ID: CGMN SBC WPA01 00150
Date Sampled......: 05/25/2005
Time Sampled......: 09:40
Sample Matrix.....: Soil

Laboratory Sample ID: 237037-3
Date Received.......: 05/27/2005
Time Received.......: 08:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	3200			86	370	1	mg/Kg	151124		06/02/05 1234	cls

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 237037

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Customer Sample ID: CGMN SBC BKG01 00000
Date Sampled......: 05/25/2005
Time Sampled......: 10:40
Sample Matrix.....: Soil

Laboratory Sample ID: 237037-4
Date Received.......: 05/27/2005
Time Received.......: 08:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	860			46	200	1	mg/Kg	151124		06/02/05 1259	cls

* In Description = Dry Wgt.

LABORATORY TEST RESULTS

Job Number: 237037

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc.

PROJECT: CONFIDENTIAL CLIENT

ATTN: Jai Kesari

Customer Sample ID: CGMN SBC B1501 00100
Date Sampled......: 05/25/2005
Time Sampled......: 12:50
Sample Matrix.....: Soil

Laboratory Sample ID: 237037-5
Date Received.......: 05/27/2005
Time Received.......: 08:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
Lloyd Kahn	Total Organic Carbon (Soils) TOC Average Duplicates, Solid	530			65	280	1	mg/Kg	151124		06/02/05 1324	cls

* In Description = Dry Wgt.

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 237037

Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Customer Sample ID: CGMN WASTE #2
Date Sampled.......: 05/26/2005
Time Sampled.......: 10:30
Sample Matrix.....: Soil

Laboratory Sample ID: 237037-6
Date Received.......: 05/27/2005
Time Received.......: 08:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
9014/9010B	Cyanide (Colorimetric)											
	Reactivity, Cyanide (9010B Dist.), Solid	0.15	B		0.08	0.42	1	mg/Kg	150918		06/03/05 1339	mtb
1010	Ignitability (Pensky-Martens Closed-Cup)											
	Ignitability (Flashpoint), Solid	>200					1	degrees F	150769		06/02/05 1100	jmk
9045C	pH (Soil)											
	Corrosivity (pH Solid), Solid	8.4			0.2	0.2	1	pH Units	151137		06/07/05 1035	pmf
7.3.4.2/9034	Reactivity, Sulfide											
	Reactivity, Sulfide, Solid	240	U		8.5	240	1	mg/Kg	150811		06/02/05 1438	mtb
7470A	Leachable, Mercury (CVAA)											
	Mercury, TCLP Leach	0.0020	U		0.0020	0.0020	1	mg/L	150805		06/02/05 1357	gok
6010B	Leachable, Metals Analysis (ICAP)											
	Arsenic, TCLP Leach	0.10	U		0.010	0.10	1	mg/L	150790		06/02/05 1047	tds
	Barium, TCLP Leach	0.63	B		0.010	1.0	1	mg/L	150790		06/02/05 1047	tds
	Cadmium, TCLP Leach	0.050	U		0.002	0.050	1	mg/L	150790		06/02/05 1047	tds
	Chromium, TCLP Leach	0.050	U		0.010	0.050	1	mg/L	150790		06/02/05 1047	tds
	Lead, TCLP Leach	0.050	U		0.0050	0.050	1	mg/L	150790		06/02/05 1047	tds
	Selenium, TCLP Leach	0.10	U		0.010	0.10	1	mg/L	150790		06/02/05 1047	tds
	Silver, TCLP Leach	0.050	U		0.005	0.050	1	mg/L	150790		06/02/05 1047	tds
8270C	Semivolatile Organics											
	Pyridine, TCLP Leach	200	U		200	200	1.00000	ug/L	151188		06/06/05 1647	dpk
	1,4-Dichlorobenzene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1647	dpk
	2-Methylphenol (o-cresol), TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1647	dpk
	Hexachloroethane, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1647	dpk

* In Description = Dry Wgt.

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L A B O R A T O R Y   T E S T   R E S U L T S

Job Number: 237037 Date:06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Customer Sample ID: CGMN WASTE #2
Date Sampled......: 05/26/2005
Time Sampled......: 10:30
Sample Matrix.....: Soil

Laboratory Sample ID: 237037-6
Date Received.......: 05/27/2005
Time Received.......: 08:45

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methylphenol (m/p-cresol), TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1647	dpk
	Nitrobenzene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1647	dpk
	Hexachlorobutadiene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1647	dpk
	2,4,6-Trichlorophenol, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1647	dpk
	2,4,5-Trichlorophenol, TCLP Leach	500	U		500	500	1.00000	ug/L	151188		06/06/05 1647	dpk
	2,4-Dinitrotoluene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1647	dpk
	Hexachlorobenzene, TCLP Leach	100	U		100	100	1.00000	ug/L	151188		06/06/05 1647	dpk
	Pentachlorophenol, TCLP Leach	500	U		500	500	1.00000	ug/L	151188		06/06/05 1647	dpk
8260B	Volatile Organics											
	Vinyl chloride, TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn
	1,1-Dichloroethene, TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn
	2-Butanone (MEK), TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn
	Chloroform, TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn
	Carbon tetrachloride, TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn
	Benzene, TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn
	1,2-Dichloroethane, TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn
	Trichloroethene, TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn
	Tetrachloroethene, TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn
	Chlorobenzene, TCLP Leach	100	U		25	100	1.0000	ug/L	151446		06/08/05 2008	jdn

* In Description = Dry Wgt.

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L A B O R A T O R Y C H R O N I C L E

Job Number: 237037 Date: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Lab ID: 237037-1 Client ID: CGMN SBC FTA02 00150 Date Recvd: 05/27/2005 Sample Date: 05/23/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
EDD	Electronic Data Deliverable	1					
Lloyd Kahn	Total Organic Carbon (Soils)	1	151124	151124	06/02/2005	1144	

Lab ID: 237037-2 Client ID: CGMN SBC D101 00200 Date Recvd: 05/27/2005 Sample Date: 05/24/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	151124	151124	06/02/2005	1209	

Lab ID: 237037-3 Client ID: CGMN SBC WPA01 00150 Date Recvd: 05/27/2005 Sample Date: 05/25/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	151124	151124	06/02/2005	1234	

Lab ID: 237037-4 Client ID: CGMN SBC BKG01 00000 Date Recvd: 05/27/2005 Sample Date: 05/25/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	151124	151124	06/02/2005	1259	

Lab ID: 237037-5 Client ID: CGMN SBC B1501 00100 Date Recvd: 05/27/2005 Sample Date: 05/25/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
Lloyd Kahn	Total Organic Carbon (Soils)	1	151124	151124	06/02/2005	1324	

Lab ID: 237037-6 Client ID: CGMN WASTE #2 Date Recvd: 05/27/2005 Sample Date: 05/26/2005

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030CP TCLP/SPLP Prep	1	151445		06/08/2005	2008	
3010A	Acid Dig. Leachates (ICAP)	1	150654	150489	06/01/2005	1800	
9014/9010B	Cyanide (Colorimetric)	1	150918	150918	06/03/2005	1339	
3510C	Extraction for TCLP (SVOC)	1	150847	150489	06/03/2005	0700	
1010	Ignitability (Pensky-Martens Closed-Cup)	1	150769	150769	06/02/2005	1100	
7470A	Leachable, Mercury (CVAA)	1	150805	150803-150489	06/02/2005	1357	
6010B	Leachable, Metals Analysis (ICAP)	1	150790	150654-150489	06/02/2005	1047	
7.3.4.2/9034	Reactivity, Sulfide	1	150811	150811	06/02/2005	1438	
7470	SW846 Dig. Leachates (Hg)	1	150803		06/02/2005	1030	
8270C	Semivolatile Organics	1	151188	150847-150489	06/06/2005	1647	1.00000
1311	TCLP Extraction	1	150489		05/31/2005	1400	
1311	TCLP Zero Headspace Extraction	1	150487		05/31/2005	1400	
8260B	Volatile Organics	1	151446	151445-150487	06/08/2005	2008	1.0000
9045C	pH (Soil)	1	151137	151137	06/07/2005	1035	

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SURROGATE RECOVERIES REPORT

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Method........: Volatile Organics
Method Code...: 8260B

Test Matrix...: TCLP Leach
Batch(s)......: 151446

Prep Batch..: 151445

Lab ID	DT	Sample ID	Date	12DCED	BRFLBE	DBRFLM	TOLD8
LCS			06/08/2005	103	99	94	96
MB			06/08/2005	108	95	97	95
236865--21 EB1			06/08/2005	107	90	97	93
236966--21 EB1			06/08/2005	102	83	94	90
237037--21 EB1			06/08/2005	107	89	95	92
237037- 6		CGMN WASTE #2	06/08/2005	109	90	100	95

Test	Test Description	Limits
12DCED	1,2-Dichloroethane-d4 (surr)	62 - 127
BRFLBE	4-Bromofluorobenzene (surr)	67 - 132
DBRFLM	Dibromofluoromethane (surr)	77 - 119
TOLD8	Toluene-d8 (surr)	81 - 126

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S U R R O G A T E   R E C O V E R I E S   R E P O R T

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: 483648 PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Method........: Semivolatile Organics
Method Code...: 8270

Test Matrix...: TCLP Leach
Batch(s)......: 151188

Prep Batch..: 150847

Lab ID	DT	Sample ID	Date	246TBP	2FLUBP	2FLUPH	NITRD5	PHEND5	TERD14
EB1			06/06/2005	57	71	56	81	36	78
EB1			06/06/2005	57	68	53	79	35	80
EB2			06/06/2005	62	67	53	81	36	85
LCS			06/06/2005	63	82	57	87	38	94
MB			06/06/2005	59	75	62	85	40	88
237037- 6		CGMN WASTE #2	06/06/2005	45	72	48	81	31	75
237037- 6	MS	CGMN WASTE #2	06/06/2005	59	73	53	82	35	75

Test	Test Description	Limits
246TBP	2,4,6-Tribromophenol (surr)	29 - 126
2FLUBP	2-Fluorobiphenyl (surr)	34 - 112
2FLUPH	2-Fluorophenol (surr)	21 - 100
NITRD5	Nitrobenzene-d5 (surr)	38 - 113
PHEND5	Phenol-d5 (surr)	18 - 100
TERD14	Terphenyl-d14 (surr)	10 - 119

Q U A L I T Y   C O N T R O L   R E S U L T S

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8270C
Method Description.: Semivolatile Organics
Equipment Code....: GCL10
Batch.............: 151188
Analyst...: dpk

EB1	Extraction Blank 1		150847-003		05/06/2005	1438

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	200.000 U							
1,4-Dichlorobenzene, TCLP Leach	ug/L	100.000 U							
2-Methylphenol (o-cresol), TCLP Leach	ug/L	100.000 U							
Hexachloroethane, TCLP Leach	ug/L	100.000 U							
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	100.000 U							
Nitrobenzene, TCLP Leach	ug/L	100.000 U							
Hexachlorobutadiene, TCLP Leach	ug/L	100.000 U							
2,4,6-Trichlorophenol, TCLP Leach	ug/L	100.000 U							
2,4,5-Trichlorophenol, TCLP Leach	ug/L	500.000 U							
2,4-Dinitrotoluene, TCLP Leach	ug/L	100.000 U							
Hexachlorobenzene, TCLP Leach	ug/L	100.000 U							
Pentachlorophenol, TCLP Leach	ug/L	500.000 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.		PROJECT: CONFIDENTIAL CLIENT		ATTN:	
QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date Time

Test Method........: 8270C
Method Description.: Semivolatile Organics

Equipment Code....: GCL10
Batch.............: 151188

Analyst...: dpk

EB1	Extraction Blank 1		150847-003		06/06/2005 1510

Parameter/Test Description	Units	QC Result		QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	200.000	U							
1,4-Dichlorobenzene, TCLP Leach	ug/L	100.000	U							
2-Methylphenol (o-cresol), TCLP Leach	ug/L	100.000	U							
Hexachloroethane, TCLP Leach	ug/L	100.000	U							
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	100.000	U							
Nitrobenzene, TCLP Leach	ug/L	100.000	U							
Hexachlorobutadiene, TCLP Leach	ug/L	100.000	U							
2,4,6-Trichlorophenol, TCLP Leach	ug/L	100.000	U							
2,4,5-Trichlorophenol, TCLP Leach	ug/L	500.000	U							
2,4-Dinitrotoluene, TCLP Leach	ug/L	100.000	U							
Hexachlorobenzene, TCLP Leach	ug/L	100.000	U							
Pentachlorophenol, TCLP Leach	ug/L	500.000	U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS					
Job Number.: 237037				Report Date.: 06/13/2005	
CUSTOMER: Weston Solutions, Inc.		PROJECT: CONFIDENTIAL CLIENT		ATTN:	
QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date Time

Test Method........: 8270C
Method Description.: Semivolatile Organics
Equipment Code....: GCL10
Batch.............: 151188
Analyst...: dpk

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
EB2	Extraction Blank 2		150847-005		06/06/2005	1542

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	200.000 U							
1,4-Dichlorobenzene, TCLP Leach	ug/L	100.000 U							
2-Methylphenol (o-cresol), TCLP Leach	ug/L	100.000 U							
Hexachloroethane, TCLP Leach	ug/L	100.000 U							
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	100.000 U							
Nitrobenzene, TCLP Leach	ug/L	100.000 U							
Hexachlorobutadiene, TCLP Leach	ug/L	100.000 U							
2,4,6-Trichlorophenol, TCLP Leach	ug/L	100.000 U							
2,4,5-Trichlorophenol, TCLP Leach	ug/L	500.000 U							
2,4-Dinitrotoluene, TCLP Leach	ug/L	100.000 U							
Hexachlorobenzene, TCLP Leach	ug/L	100.000 U							
Pentachlorophenol, TCLP Leach	ug/L	500.000 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS		
Job Number.: 237037		Report Date.: 06/13/2005
CUSTOMER: Weston Solutions, Inc.	PROJECT: CONFIDENTIAL CLIENT	ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8270C
Method Description.: Semivolatile Organics
Equipment Code....: GCL10
Batch.............: 151188
Analyst...: dpk

LCS	Laboratory Control Sample	05EWLMPCA	150847-002		06/06/2005	1406

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	63.016		100.000	20.000 U	63	%	16-100	
1,4-Dichlorobenzene, TCLP Leach	ug/L	78.093		100.000	10.000 U	78	%	38-100	
2-Methylphenol (o-cresol), TCLP Leach	ug/L	76.857		100.000	10.000 U	77	%	37-100	
Hexachloroethane, TCLP Leach	ug/L	72.158		100.000	10.000 U	72	%	34-100	
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	74.011		100.000	10.000 U	74	%	35-106	
Nitrobenzene, TCLP Leach	ug/L	79.886		100.000	10.000 U	80	%	41-105	
Hexachlorobutadiene, TCLP Leach	ug/L	62.966		100.000	10.000 U	63	%	41-100	
2,4,6-Trichlorophenol, TCLP Leach	ug/L	85.824		100.000	10.000 U	86	%	51-101	
2,4,5-Trichlorophenol, TCLP Leach	ug/L	82.419		100.000	50.000 U	82	%	54-107	
2,4-Dinitrotoluene, TCLP Leach	ug/L	85.191		100.000	10.000 U	85	%	56-115	
Hexachlorobenzene, TCLP Leach	ug/L	75.485		100.000	10.000 U	75	%	50-113	
Pentachlorophenol, TCLP Leach	ug/L	67.542		100.000	50.000 U	68	%	50-112	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8270C
Method Description.: Semivolatile Organics
Equipment Code....: GCL10
Batch.............: 151188
Analyst...: dpk

MB	Method Blank		150847-001		06/06/2005	1335

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	20.000 U							
1,4-Dichlorobenzene, TCLP Leach	ug/L	10.000 U							
2-Methylphenol (o-cresol), TCLP Leach	ug/L	10.000 U							
Hexachloroethane, TCLP Leach	ug/L	10.000 U							
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	10.000 U							
Nitrobenzene, TCLP Leach	ug/L	10.000 U							
Hexachlorobutadiene, TCLP Leach	ug/L	10.000 U							
2,4,6-Trichlorophenol, TCLP Leach	ug/L	10.000 U							
2,4,5-Trichlorophenol, TCLP Leach	ug/L	50.000 U							
2,4-Dinitrotoluene, TCLP Leach	ug/L	10.000 U							
Hexachlorobenzene, TCLP Leach	ug/L	10.000 U							
Pentachlorophenol, TCLP Leach	ug/L	50.000 U							

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

3MA01552350

QUALITY CONTROL RESULTS

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.		PROJECT: CONFIDENTIAL CLIENT		ATTN:	
QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date Time

Test Method........: 8270C
Method Description.: Semivolatile Organics
Equipment Code....: GCL10
Batch.............: 151188
Analyst...: dpk

MS	Matrix Spike	05EWLMPCA	237037-6		06/06/2005 1719

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Pyridine, TCLP Leach	ug/L	412.457		1000.000	200.000 U	41	%	16-100	
1,4-Dichlorobenzene, TCLP Leach	ug/L	694.205		1000.000	100.000 U	69	%	38-100	
2-Methylphenol (o-cresol), TCLP Leach	ug/L	753.849		1000.000	100.000 U	75	%	37-100	
Hexachloroethane, TCLP Leach	ug/L	621.828		1000.000	100.000 U	62	%	34-100	
4-Methylphenol (m/p-cresol), TCLP Leac	ug/L	735.371		1000.000	100.000 U	74	%	35-106	
Nitrobenzene, TCLP Leach	ug/L	785.401		1000.000	100.000 U	79	%	41-105	
Hexachlorobutadiene, TCLP Leach	ug/L	559.664		1000.000	100.000 U	56	%	41-100	
2,4,6-Trichlorophenol, TCLP Leach	ug/L	812.893		1000.000	100.000 U	81	%	51-101	
2,4,5-Trichlorophenol, TCLP Leach	ug/L	831.182		1000.000	500.000 U	83	%	54-107	
2,4-Dinitrotoluene, TCLP Leach	ug/L	889.368		1000.000	100.000 U	89	%	56-115	
Hexachlorobenzene, TCLP Leach	ug/L	709.603		1000.000	100.000 U	71	%	50-113	
Pentachlorophenol, TCLP Leach	ug/L	687.933		1000.000	500.000 U	69	%	50-112	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037 | Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. | PROJECT: CONFIDENTIAL CLIENT | ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8260B | Equipment Code....: GCL16 | Analyst...: jdn

Method Description.: Volatile Organics | Batch.............: 151446

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
EB1	Extraction Blank 1	6966	151445-003		06/08/2005	1832

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Vinyl chloride, TCLP Leach	ug/L	100.000 U							
1,1-Dichloroethene, TCLP Leach	ug/L	100.000 U							
2-Butanone (MEK), TCLP Leach	ug/L	100.000 U							
Chloroform, TCLP Leach	ug/L	100.000 U							
Carbon tetrachloride, TCLP Leach	ug/L	100.000 U							
Benzene, TCLP Leach	ug/L	100.000 U							
1,2-Dichloroethane, TCLP Leach	ug/L	100.000 U							
Trichloroethene, TCLP Leach	ug/L	100.000 U							
Tetrachloroethene, TCLP Leach	ug/L	100.000 U							
Chlorobenzene, TCLP Leach	ug/L	100.000 U							

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.	PROJECT: CONFIDENTIAL CLIENT	ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date Time
EB1	Extraction Blank 1	7037	151445-004		06/08/2005 1856

Test Method........: 8260B
Method Description.: Volatile Organics

Equipment Code....: GCL16
Batch.............: 151446

Analyst...: jdn

Parameter/Test Description	Units	QC Result		QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Vinyl chloride, TCLP Leach	ug/L	100.000	U							
1,1-Dichloroethene, TCLP Leach	ug/L	100.000	U							
2-Butanone (MEK), TCLP Leach	ug/L	100.000	U							
Chloroform, TCLP Leach	ug/L	100.000	U							
Carbon tetrachloride, TCLP Leach	ug/L	100.000	U							
Benzene, TCLP Leach	ug/L	100.000	U							
1,2-Dichloroethane, TCLP Leach	ug/L	100.000	U							
Trichloroethene, TCLP Leach	ug/L	100.000	U							
Tetrachloroethene, TCLP Leach	ug/L	100.000	U							
Chlorobenzene, TCLP Leach	ug/L	100.000	U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.		PROJECT: CONFIDENTIAL CLIENT		ATTN:	
QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date Time

Test Method........: 8260B
Method Description.: Volatile Organics

Equipment Code....: GCL16
Batch.............: 151446

Analyst...: jdn

EB1	Extraction Blank 1	6865	151445-005		06/08/2005 1920

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Vinyl chloride, TCLP Leach	ug/L	100.000 U							
1,1-Dichloroethene, TCLP Leach	ug/L	100.000 U							
2-Butanone (MEK), TCLP Leach	ug/L	100.000 U							
Chloroform, TCLP Leach	ug/L	100.000 U							
Carbon tetrachloride, TCLP Leach	ug/L	100.000 U							
Benzene, TCLP Leach	ug/L	100.000 U							
1,2-Dichloroethane, TCLP Leach	ug/L	100.000 U							
Trichloroethene, TCLP Leach	ug/L	100.000 U							
Tetrachloroethene, TCLP Leach	ug/L	100.000 U							
Chlorobenzene, TCLP Leach	ug/L	100.000 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037 Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.	PROJECT: CONFIDENTIAL CLIENT	ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8260B
Method Description.: Volatile Organics
Equipment Code....: GCL16
Batch.............: 151446
Analyst...: jdn

LCS	Laboratory Control Sample	V05F08DSA	151445-002		06/08/2005	1100

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Vinyl chloride, TCLP Leach	ug/L	419.756		500.000	100.000	U 84	%	52-134	
1,1-Dichloroethene, TCLP Leach	ug/L	568.760		500.000	100.000	U 114	%	51-136	
2-Butanone (MEK), TCLP Leach	ug/L	450.964		500.000	100.000	U 90	%	29-139	
Chloroform, TCLP Leach	ug/L	483.812		500.000	100.000	U 97	%	75-122	
Carbon tetrachloride, TCLP Leach	ug/L	524.058		500.000	100.000	U 105	%	64-132	
Benzene, TCLP Leach	ug/L	446.642		500.000	100.000	U 89	%	75-122	
1,2-Dichloroethane, TCLP Leach	ug/L	510.630		500.000	100.000	U 102	%	67-120	
Trichloroethene, TCLP Leach	ug/L	453.156		500.000	100.000	U 91	%	75-124	
Tetrachloroethene, TCLP Leach	ug/L	456.820		500.000	100.000	U 91	%	70-125	
Chlorobenzene, TCLP Leach	ug/L	443.474		500.000	100.000	U 89	%	76-116	

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

Job Number.: 237037

QUALITY CONTROL RESULTS

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 8260B
Method Description.: Volatile Organics

Equipment Code....: GCL16
Batch.............: 151446

Analyst...: jdn

MB	Method Blank		151445-001		06/08/2005	1036

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Vinyl chloride, TCLP Leach	ug/L	100.000 U							
1,1-Dichloroethene, TCLP Leach	ug/L	100.000 U							
2-Butanone (MEK), TCLP Leach	ug/L	100.000 U							
Chloroform, TCLP Leach	ug/L	100.000 U							
Carbon tetrachloride, TCLP Leach	ug/L	100.000 U							
Benzene, TCLP Leach	ug/L	100.000 U							
1,2-Dichloroethane, TCLP Leach	ug/L	100.000 U							
Trichloroethene, TCLP Leach	ug/L	100.000 U							
Tetrachloroethene, TCLP Leach	ug/L	100.000 U							
Chlorobenzene, TCLP Leach	ug/L	100.000 U							

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

	QUALITY CONTROL RESULTS	
Job Number.: 237037		Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP5
Batch............: 150790
Analyst...: tds

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
EB1	Extraction Blank 1	150489	150654-001		06/02/2005	1004

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Arsenic, TCLP Leach	mg/L	0.01000 U							
Barium, TCLP Leach	mg/L	0.01000 U							
Cadmium, TCLP Leach	mg/L	0.00200 U							
Chromium, TCLP Leach	mg/L	0.01000 U							
Lead, TCLP Leach	mg/L	0.00500 U							
Selenium, TCLP Leach	mg/L	0.01000 U							
Silver, TCLP Leach	mg/L	0.00500 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method........: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP5
Batch.............: 150790
Analyst...: tds

EB2	Extraction Blank 2		150654-002		06/02/2005	1009

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Arsenic, TCLP Leach	mg/L	0.01000 U							
Barium, TCLP Leach	mg/L	0.01000 U							
Cadmium, TCLP Leach	mg/L	0.00200 U							
Chromium, TCLP Leach	mg/L	0.01000 U							
Lead, TCLP Leach	mg/L	0.00500 U							
Selenium, TCLP Leach	mg/L	0.01000 U							
Silver, TCLP Leach	mg/L	0.00500 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.		PROJECT: CONFIDENTIAL CLIENT		ATTN:	
QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date Time

Test Method........: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP5
Batch.............: 150790
Analyst...: tds

EB3	DI Blank		150654-012		06/02/2005 1015

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Arsenic, TCLP Leach	mg/L	0.01000 U							
Barium, TCLP Leach	mg/L	0.01000 U							
Cadmium, TCLP Leach	mg/L	0.00200 U							
Chromium, TCLP Leach	mg/L	0.01000 U							
Lead, TCLP Leach	mg/L	0.00500 U							
Selenium, TCLP Leach	mg/L	0.01000 U							
Silver, TCLP Leach	mg/L	0.00500 U							

EB3	DI Blank		150654-014		06/02/2005 1019

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Arsenic, TCLP Leach	mg/L	0.01000 U							
Barium, TCLP Leach	mg/L	0.01000 U							
Cadmium, TCLP Leach	mg/L	0.00200 U							
Chromium, TCLP Leach	mg/L	0.01000 U							
Lead, TCLP Leach	mg/L	0.00500 U							
Selenium, TCLP Leach	mg/L	0.01000 U							
Silver, TCLP Leach	mg/L	0.00500 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037 | Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc.	PROJECT: CONFIDENTIAL CLIENT	ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
LCS	Laboratory Control Sample	M05ESPK002	150654-003		06/02/2005	1024

Test Method........: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP5
Batch.............: 150790
Analyst...: tds

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Arsenic, TCLP Leach	mg/L	0.09857 B		0.10000	0.01000 U	99	%	80-120	
Barium, TCLP Leach	mg/L	1.99410		2.00000	0.01000 U	100	%	80-120	
Cadmium, TCLP Leach	mg/L	0.04931 B		0.05000	0.00200 U	99	%	80-120	
Chromium, TCLP Leach	mg/L	0.19911		0.20000	0.01000 U	100	%	80-120	
Lead, TCLP Leach	mg/L	0.10460		0.10000	0.00500 U	105	%	80-120	
Selenium, TCLP Leach	mg/L	0.09794 B		0.10000	0.01000 U	98	%	80-120	
Silver, TCLP Leach	mg/L	0.04770 B		0.05000	0.00500 U	95	%	80-120	

 * %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037

Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Test Method........: 9014/9010B
Method Description.: Cyanide (Colorimetric)
Parameter..........: Cyanide, Total
Batch.............: 150918
Equipment Code....: SPEC4
Analyst...: mtb
Test Code.: CN

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
MB	150918-004		mg/L	0.00260 B								06/03/2005	1331
LCS	150918-005	I05BSTCN2	mg/L	0.08780		0.10000	0.00260 B	88		%	80-120	06/03/2005	1332

Test Method........: Lloyd Kahn
Method Description.: Total Organic Carbon (Soils)
Parameter..........: Organic Carbon, Tot. (TOC)
Batch.............: 151124
Equipment Code....: TOC4
Analyst...: cls
Test Code.: TOC

)C	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
4B	151124-003		mg/Kg	29.00 U								06/02/2005	0849

Test Method........: Lloyd Kahn
Method Description.: Total Organic Carbon (Soils)
Parameter..........: TOC Average Duplicates
Batch.............: 151124
Equipment Code....: TOC4
Analyst...: cls
Test Code.: TOCAV2

C	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
CS	151124-004	I00FSTLK3	mg/Kg	5059.77		4780.00		106		%	53-140	06/02/2005	0914

Test Method........: 9045C
Method Description.: pH (Soil)
Parameter..........: pH
Batch.............: 151137
Equipment Code....:
Analyst...: pmf
Test Code.: PH

:	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
;P	151137-002	I05EPH7B	pH Units	6.97000		7.00000		0.03000		A	0.20000	06/07/2005	1031
'P	151137-003	I05EPH7B	pH Units	6.95000		7.00000		0.05000		A	0.20000	06/07/2005	1031

Test Method........: 7.3.4.2/9034
Method Description.: Reactivity, Sulfide
Parameter..........: Reactivity, Sulfide
Batch.............: 150811
Equipment Code....:
Analyst...: mtb
Test Code.: REACS

	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
	150811-001		mg/Kg	8.80 U								06/02/2005	1425
;	150811-002	I05BSTSF1A	mg/Kg	134.34 B		185.60	8.80 U	72		%	25-116	06/02/2005	1429
	237037-6	I05BSTSF1	mg/Kg	38.19 B		185.70	8.51 U	21	N	%	25-116	06/02/2005	1442
)	237037-6	I05BSTSF1A	mg/Kg	40.60 B	38.19 B	180.00	8.54 U	23	N	%	25-116	06/02/2005	1446
								9		R	50		

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 237037 Report Date.: 06/13/2005

CUSTOMER: Weston Solutions, Inc. PROJECT: CONFIDENTIAL CLIENT ATTN: Jai Kesari

Test Method........: 7470A
Method Description.: Leachable, Mercury (CVAA)
Parameter.........: Mercury
Batch.............: 150805
Equipment Code....: HG4
Analyst...: gok
Test Code.: HG

QC	Lab ID	Reagent	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	F	*	Limits	Date	Time
MB	150803-007		ug/L	0.20 U								06/02/2005	1331
LCS	150803-008	M04LSTK010	ug/L	2.12		2.00	0.20 U	106		%	80-120	06/02/2005	1334
EB3	150803-009	788	mg/L	0.00200 U								06/02/2005	1336
EB1	150803-013	792	mg/L	0.00200 U								06/02/2005	1345
EB2	150803-014	792	mg/L	0.00200 U								06/02/2005	1351
EB1	150803-023	793	mg/L	0.00200 U								06/02/2005	1410

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

REPORT COMMENTS

1) All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.
2) Soil, sediment and sludge sample results are reported on a "dry weight" basis except when analyzed for landfill disposal or incineration parameters. All other solid matrix samples are reported on an "as received" basis unless noted differently.
3) Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.
4) The test results for the noted analytical method(s) meet the requirements of NELAC. Lab Cert. ID# 100201
5) According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH Field) they were not analyzed immediately, but as soon as possible on laboratory receipt.

Glossary of flags, qualifiers and abbreviations (any number of which may appear in the report)

Inorganic Qualifiers (Q-Column)

U	Analyte was not detected at or above the stated limit.
<	Not detected at or above the reporting limit.
J	Result is less than the RL, but greater than or equal to the method detection limit.
B	Result is less than the CRDL/RL, but greater than or equal to the IDL/MDL.
S	Result was determined by the Method of Standard Additions.
F	AFCEE: Result is less than the RL, but greater than or equal to the method detection limit.

Inorganic Flags (Flag Column)

^	ICV,CCV,ICB,CCB,ISA,ISB,CRI,CRA,MRL: Instrument related QC exceed the upper or lower control limits.
*	LCS, LCD, MD: Batch QC exceeds the upper or lower control limits.
+	MSA correlation coefficient is less than 0.995.
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
E	SD: Serial dilution exceeds the control limits.
H	MB, EB1, EB2, EB3: Batch QC is greater than reporting limit or had a negative instrument reading lower than the absolute value of the reporting limit.
N	MS, MSD: Spike recovery exceeds the upper or lower control limits.
W	AS(GFAA) Post-digestion spike was outside 85-115% control limits.

Organic Qualifiers (Q - Column)

U	Analyte was not detected at or above the stated limit.
ND	Compound not detected.
J	Result is an estimated value below the reporting limit or a tentatively identified compound (TIC).
Q	Result was qualitatively confirmed, but not quantified.
C	Pesticide identification was confirmed by GC/MS.
Y	The chromatographic response resembles a typical fuel pattern.
Z	The chromatographic response does not resemble a typical fuel pattern.
E	Result exceeded calibration range, secondary dilution required.
F	AFCEE:Result is an estimated value below the reporting limit or a tentatively identified compound (TIC)

Organic Flags (Flags Column)

B	MB: Batch QC is greater than reporting limit.
*	LCS, LCD, ELC, ELD, CV, MS, MSD, Surrogate: Batch QC exceeds the upper or lower control limits.
^	EB1, EB2, EB3, MLE: Batch QC is greater than reporting limit
A	Concentration exceeds the instrument calibration range
a	Concentration is below the method Reporting Limit (RL)
B	Compound was found in the blank and sample.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution will be flagged with a D.
H	Alternate peak selection upon analytical review
I	Indicates the presence of an interfence, recovery is not calculated.
M	Manually integrated compound.
P	The lower of the two values is reported when the % difference between the results of two GC columns is

greater than 25%.

Abbreviations

AS	Post Digestion Spike (GFAA Samples - See Note 1 below)
Batch	Designation given to identify a specific extraction, digestion, preparation set, or analysis set
CAP	Capillary Column CCB Continuing Calibration Blank
CCV	Continuing Calibration Verification
CF	Confirmation analysis of original
C1	Confirmation analysis of A1 or D1
C2	Confirmation analysis of A2 or D2
C3	Confirmation analysis of A3 or D3
CRA	Low Level Standard Check - GFAA; Mercury
CRI	Low Level Standard Check - ICP
CV	Calilbration Verification Standard
Dil Fac	Dilution Factor - Secondary dilution analysis
D1	Dilution 1
D2	Dilution 2
D3	Dilution 3
DLFac	Detection Limit Factor
DSH	Distilled Standard - High Level
DSL	Distilled Standard - Low Level
DSM	Distilled Standard - Medium Level
EB1	Extraction Blank 1
EB2	Extraction Blank 2
EB3	DI Blank
ELC	Method Extracted LCS
ELD	Method Extracted LCD
ICAL	Initial calibration
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
IDL	Instrument Detection Limit
ISA	Interference Check Sample A - ICAP
ISB	Interference Check Sample B - ICAP
Job No.	The first six digits of the sample ID which refers to a specific client, project and sample group
	Lab ID An 8 number unique laboratory identification
LCD	Laboratory Control Standard Duplicate
LCS	Laboratory Control Standard with reagent grade water or a matrix free from the analyte of interest
MB	Method Blank or (PB) Preparation Blank
MD	Method Duplicate
MDL	Method Detection Limit
MLE	Medium Level Extraction Blank
MRL	Method Reporting Limit Standard
MSA	Method of Standard Additions
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ND	Not Detected
PREPF	Preparation factor used by the Laboratory's Information Management System (LIMS)
PDS	Post Digestion Spike (ICAP)
RA	Re-analysis of original
A1	Re-analysis of D1
A2	Re-analysis of D2
A3	Re-analysis of D3
RD	Re-extraction of dilution
RE	Re-extraction of original
RC	Re-extraction Confirmation
RL	Reporting Limit
RPD	Relative Percent Difference of duplicate (unrounded) analyses
RRF	Relative Response Factor
RT	Retention Time

RTW	Retention Time Window Sample ID A 9 digit number unique for each sample, the first six digits are referred as the job number
SCB	Seeded Control Blank
SD	Serial Dilution (Calculated when sample concentration exceeds 50 times the MDL)
UCB	Unseeded Control Blank
SSV	Second Source Verification Standard
SLCS	Solid Laboratory Control Standard(LCS)
PHC	pH Calibration Check LCSP pH Laboratory Control Sample
LCDP	pH Laboratory Control Sample Duplicate
MDPH	pH Sample Duplicate
MDFP	Flashpoint Sample Duplicate
LCFP	Flashpoint LCS
G1	Gelex Check Standard Range 0-1
G2	Gelex Check Standard Range 1-10
G3	Gelex Check Standard Range 10-100
G4	Gelex Check Standard Range 100-1000

Note 1: The Post Spike Designation on Batch QC for GFAA is designated with an "S" added to the current abbreviation used. EX. LCS S=LCS Post Spike (GFAA); MSS=MS Post Spike (GFAA)

Note 2: The MD calculates an absolute difference (A) when the sample concentration is less than 5 times the reporting limit. The control limit is represented as +/- the RL.

Shaded Areas For Internal Use Only 1 of 1

SEVERN TRENT **STL**

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2417 Bond Street
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E-Mail: T.FRINAK@WESTONSOLUTIONS.COM

Bill To:
Contact: PATTI ZONETTI
Company: WESTON SOLUTIONS
Address: 1400 WESTON WAY 5-2
WESTCHESTER PA 19380
Phone: 610-701-4524
Fax: 610-701-7401
PO#: Quote:

Lab Lot# 237037

Package Sealed: Yes No — Yes
Samples Sealed: Yes No — No
Received on Ice: Yes No — Yes
Samples Intact: Yes No — Yes
Temperature °C of Cooler: 4
Within Hold Time: Yes No — Yes
Preserv. Indicated: Yes No NA — Yes
pH Check OK: Yes No NA — NA
Res Cl- Check OK: Yes No NA — NA
Sample Labels and COC Agree: Yes No — Yes
COC not present

Sampler Name: ETHAN CALDWELL
Signature:
Project Name: COTTAGE GROVE
Project Number: 02181.002.010.0001
Project Location:
Date Required
Hard Copy: __/__/__
Fax: __/__/__
Lab PM:

Refrig #
/ Cont.
Volume
Preserv.

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	TOC	WASTE	Additional Analyses / Remarks
1		CGMN SBC FTA02 0 0150	5/23	1340	S	C	X		
2		CGMN SBC DB1 0 0200	5/24	1340	S	C	X		
3		CGMN SBC WPA01 0 0150	5/25	0940	S	C	X		
4		CGMN SBC BKG01 0 0000	5/25	1040	S	C	X		
5		CGMN SBC B1501 0 0100	5/25	1250	S	C	X		
6		CGMN WASTE #2	5/26	1030	S	C		X	

RELINQUISHED BY	COMPANY WESTON	DATE 5/26/05	TIME 1200	RECEIVED BY	FEDEX	COMPANY		DATE	TIME
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY		COMPANY	SR	DATE 5/27/05	TIME 0845

COMMENTS

Date Received 5 / 27 / 05
Courier: FX Hand Delivered ☐
Bill of Lading See attach

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O =

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

3MA01552366

TTL

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Albany . Valdosta GEORGIA

TRANSMITTAL

TO: Weston Solutions, Inc.
1625 Pumphrey Ave
Auburn, AL 36832

DATE: August 5, 2005
TTL JOB NUMBER: 020504-041
ATTN: Mr. Tim Frinak

PROJECT: Reference No. 02181-129-081-0001
Decatur, AL

WE ARE SENDING YOU:

- [x] **HEREWITH**
- [ ] **UNDER SEPARATE COVER**

9 Grain Size Distributions and 3 Grain Size Distribution with Hydrometers for samples listed on Weston Solutions Chain of Custody / Analysis Request Form dated 06/08/05 (copy attached)

REMARKS:

TTL, Inc.

Oscar M. Gay, P.E.

F:\2004\020504\041 - Weston - Lab Testing\June 2005 - Labwork\08-05-05 TRN - T.Frinak.wpd

3MA01552367

3M Environmental Laboratory

Form 38778 - PWO

Shipping Address:
3M Bldg. 2-3E-09
935 Bush Avenue
St. Paul, MN 55106

Telephone:
Sample Receiving: (651) 778-4948
Alternate: (651) 778-6783
FAX: (651) 778-6176

Chain of Custody /Request for Laboratory Analytical

09347

3M Env. Lab Project # For Internal Use Only

Project ID/Project Name			
Template #		Final Report Due Date	
Project Lead		Internal Due Date	
Dept. # (main)		Class/Job/Project #	

Report Results to:

Contact Name	TIM FRINAK	Date Available	
Company	WESTON SOLUTIONS		
Mailing Address	1625 PUMPHREY AVE.	Date Due	
City, State, Zip	AUBURN, AL		
Telephone #	334 466 5600 FAX # 334 466 5660	Contract Lab	

Special Instructions and/or Specific Regulatory Requirements:
(method, limit of detection, reporting units, etc.)

Preservatives: Enter the number of containers of each

Analysis Requested: Complete below. Attach any associated information. (Enter an 'X' in the box below to indicate request)

Item #	Client Sample Identification	3M LIMS#	Date Sampled	Time Sampled	Matrix/ Media	HNO₃	H_2SO_4	VOCs	None	Other	Total Number of Containers	CGMN Size w/ Hydrometer
1.	CGMN SBC D201 0 0200		5/17	1130	S						1	X
2.	CGMN SBC D104 0 0100		5/18	0945	S						1	X
3.	CGMN SBC D104 0 0450		5/18	1120	S						1	X
4.	CGMN SBC D103 0 0350		5/19	0835	S						1	X
5.	CGMN SBC D103 0 0500		5/19	0930	S						1	X
6.	CGMN SBC D501 0 0150		5/20	1000	S						1	X
7.	CGMN SBC D801 0 0050		5/20	1105	S						1	X
8.	CGMN SBC FTA02 0 0150		5/23	1340	S						1	X
9.	CGMN SBC D101 0 0200		5/24	1340	S						1	X
10.	CGMN SBC WPA01 0 0150		5/25	0940	S						1	X

Collected by (print):

Collector's signature:

Chain of Custody

Item #	Relinquished by/Affiliation	Time	Date	Shipped Via	Received by/Affiliation	Time	Date
		1300	6/8/05		TTL	1300	6/8/05

Sample Condition Upon Receipt: O Acceptable O Other:

Temperature: °C O Received on Ice

Other Associated CoCs:

Copies to:

Comments:

Page ____ Of ____ Original - Accompanying Samples Last Page - Originator See Reverse Side for Instructions

2095.0591

3MA01552368

3M Environmental Laboratory

Form 38778 - PWO

Shipping Address:
3M Bldg. 2-3E-09
935 Bush Avenue
St. Paul, MN 55106

Telephone:
Sample Receiving: (651) 778-4946
Alternate: (651) 778-6753
FAX: (651) 778-6176

Chain of Custody /Request for Laboratory Analytical

09372

3M Env. Lab Project # For Internal Use Only:

Project ID/Project Name:
Template #
Project Lead
Dept. # (main)
Final Report Due Date
Internal Due Date
Class/Job/Project #

Report Results to:

Contact Name: TIM FRINAK
Company: WESTON SOLUTIONS
Mailing Address:
City, State, Zip:
Telephone #: 334-466-5600 FAX #

Date Available
Date Due
Contract Lab

Special Instructions and/or Specific Regulatory Requirements: (method, limit of detection, reporting units, etc.)

Preservatives: (Enter the number of containers of each)

Analysis Requested: Complete below. Attach any associated information. (Enter an 'X' in the box below to indicate request)

Item #	Client Sample Identification	3M LIMS#	Date Sampled	Time Sampled	Matrix/ Media	HNO3	H2SO4	VOCs	None	Other	Total Number of Containers	Gammasizer W/ Hydrometer									
1.	CGMN SBC BKG01 0 0000		5/25	1040	S						1	X									
2.	CGMN SBC B1501 0 0100		5/25	1250	S						1	X									
3.																					
4.																					
5.																					
6.																					
7.																					
8.																					
9.																					
10.																					

Chain of Custody

Collected by (print):
Collector's signature:

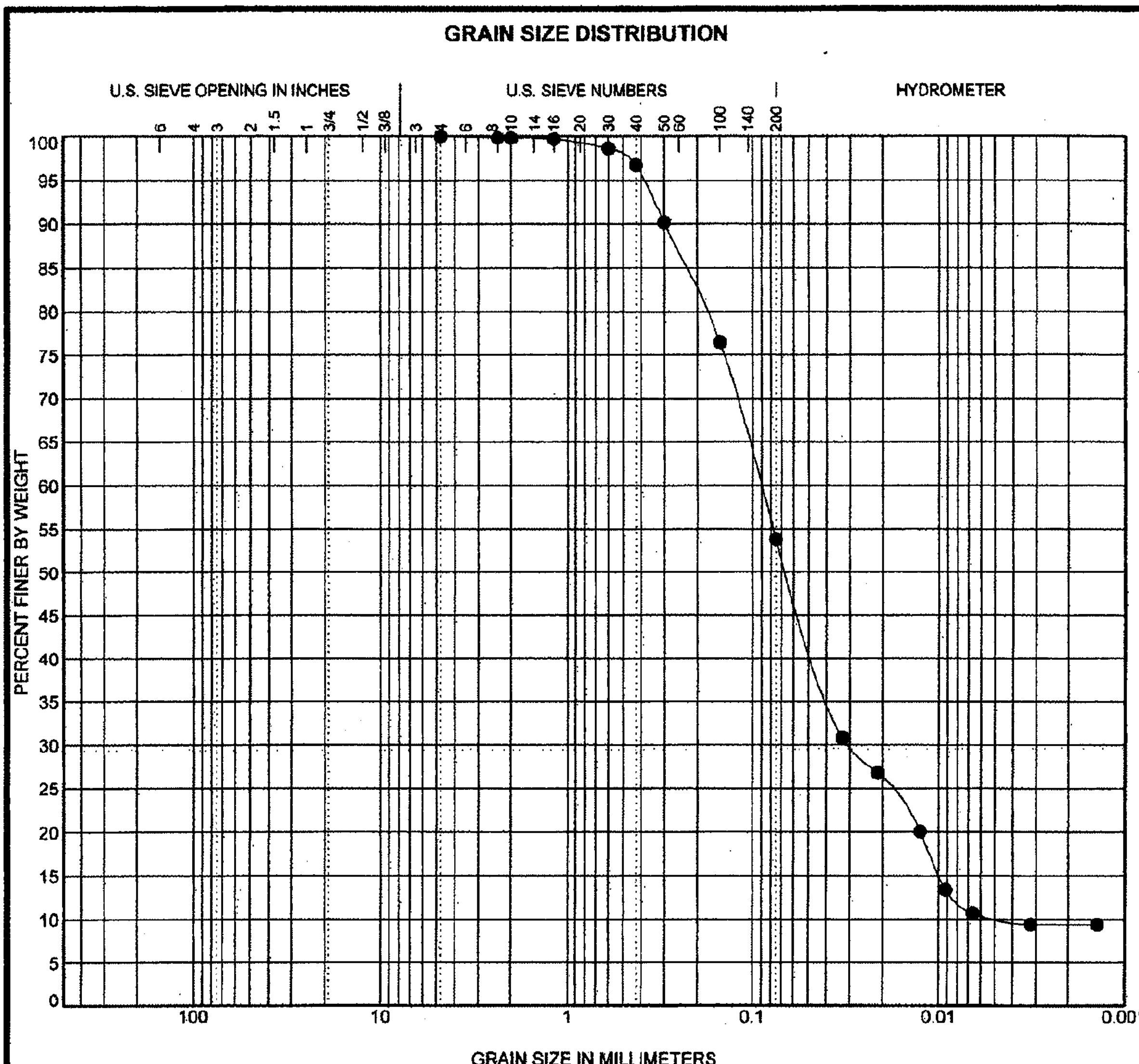
Item #	Relinquished by/Affiliation	Time	Date	Shipped Via	Received by/Affiliation	Time	Date
	[signature]	1300	6/8/05	FTL	[signature]	1300	6/8/05

Sample Condition Upon Receipt: O Acceptable O Other:
Temperature: °C O Received on Ice
Other Associated CoCs:
Copies to:
Comments:

Page ____ Of ____ Original - Accompanying Samples Last Page - Originator See Reverse Side for Instructions

2095.0592

3MA01552369



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-D201-0-0200
Description	% Silt - 43.8 % Clay - 10.0
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/17/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				2.24	20.27	4.7	0.1	0	0	0.0	46.2	53.8	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
Location: Decatur, AL
Project Number: 020504-041

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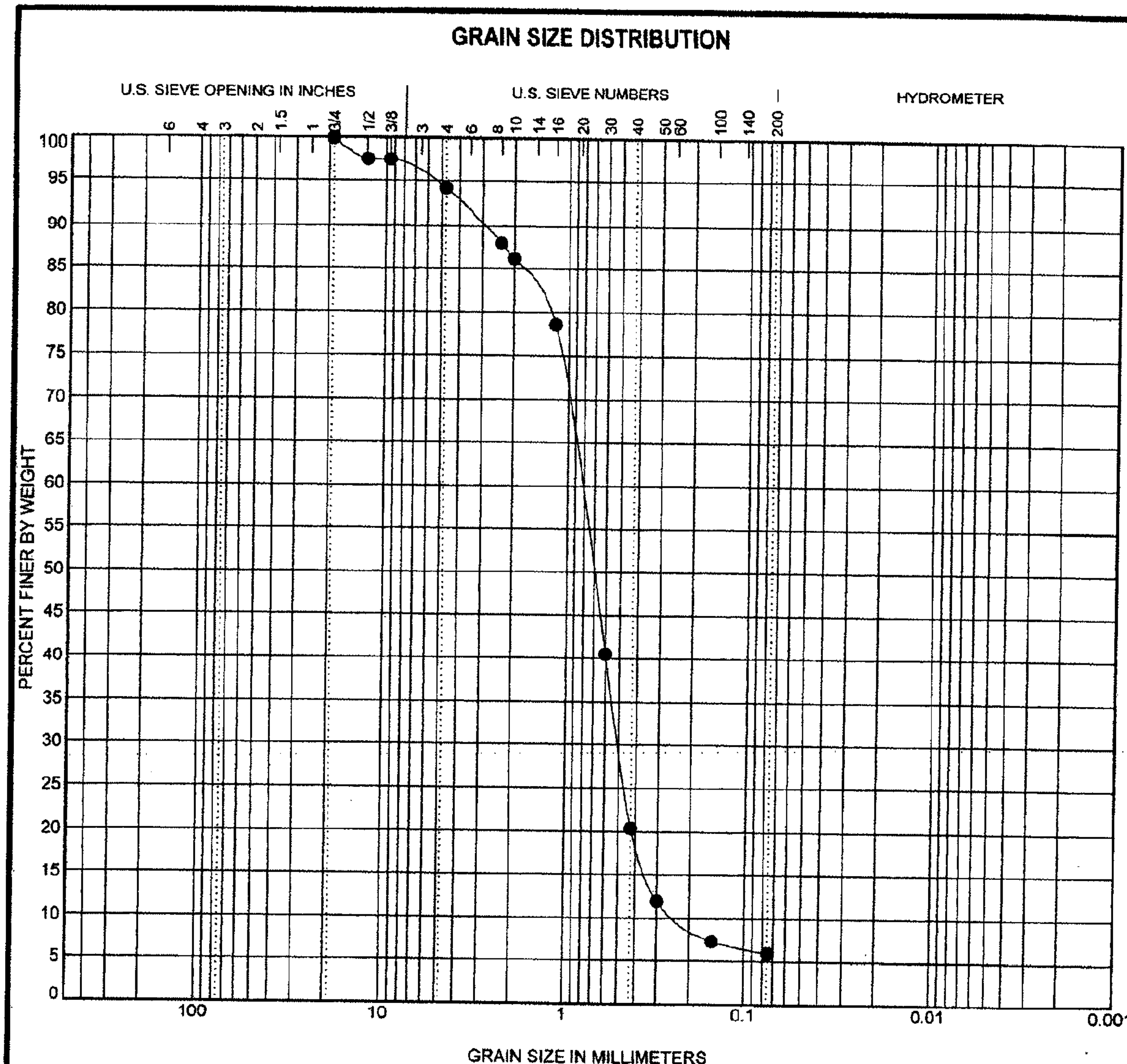
3MA01552370



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-D104-0-0100
Description	POORLY GRADED SAND (SP)
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/18/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				1.32	3.78	19	0.8	0.5	0.2	5.8	88.3	5.9	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
Location: Decatur, AL
Project Number: 020504-041

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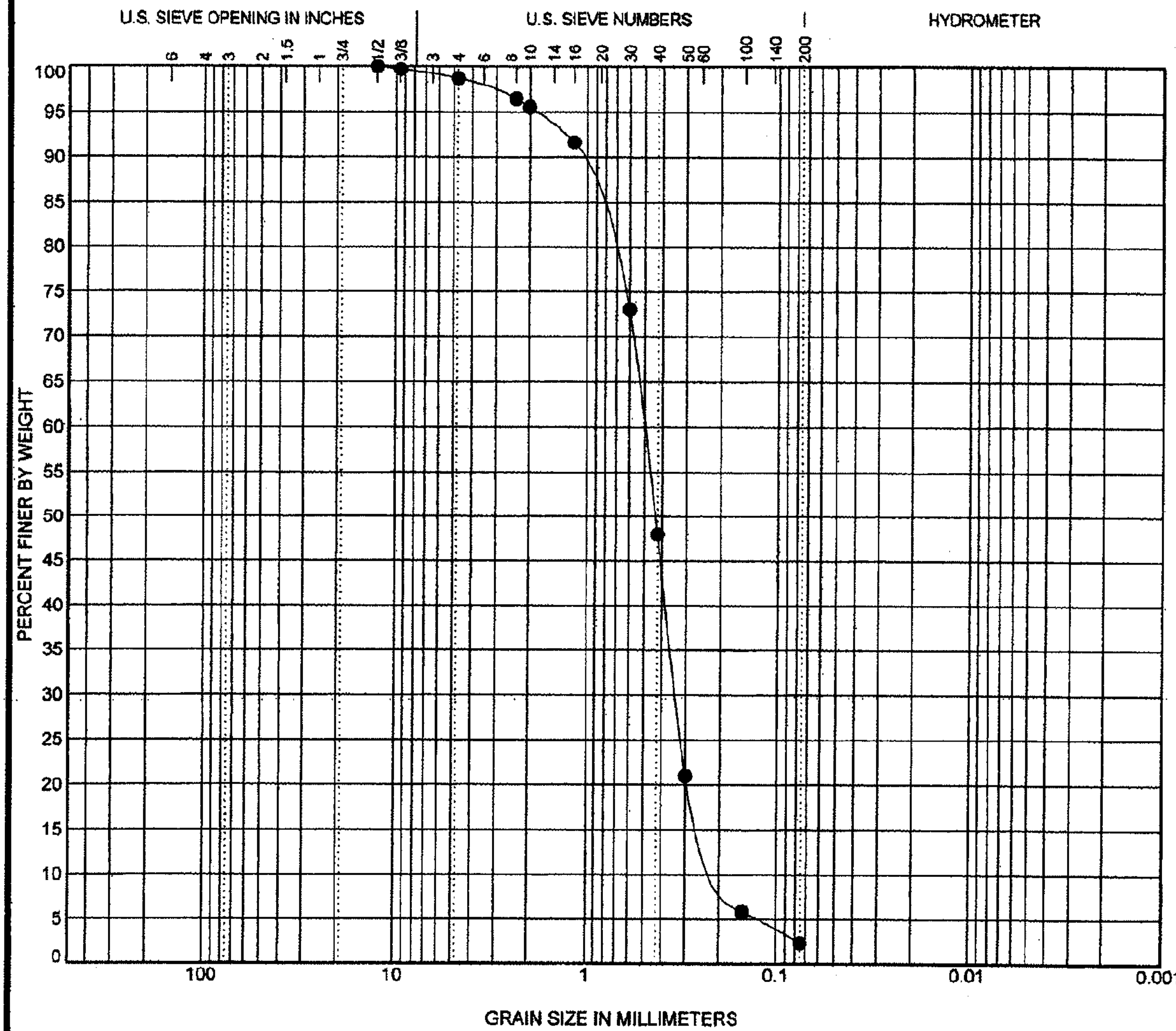
3MA01552371

GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-D104-0-0450
Description	POORLY GRADED SAND (SP)
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/18/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				1.26	2.76	12.5	0.5	0.3	0.2	1.3	96.3	2.4	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
Location: Decatur, AL
Project Number: 020504-041

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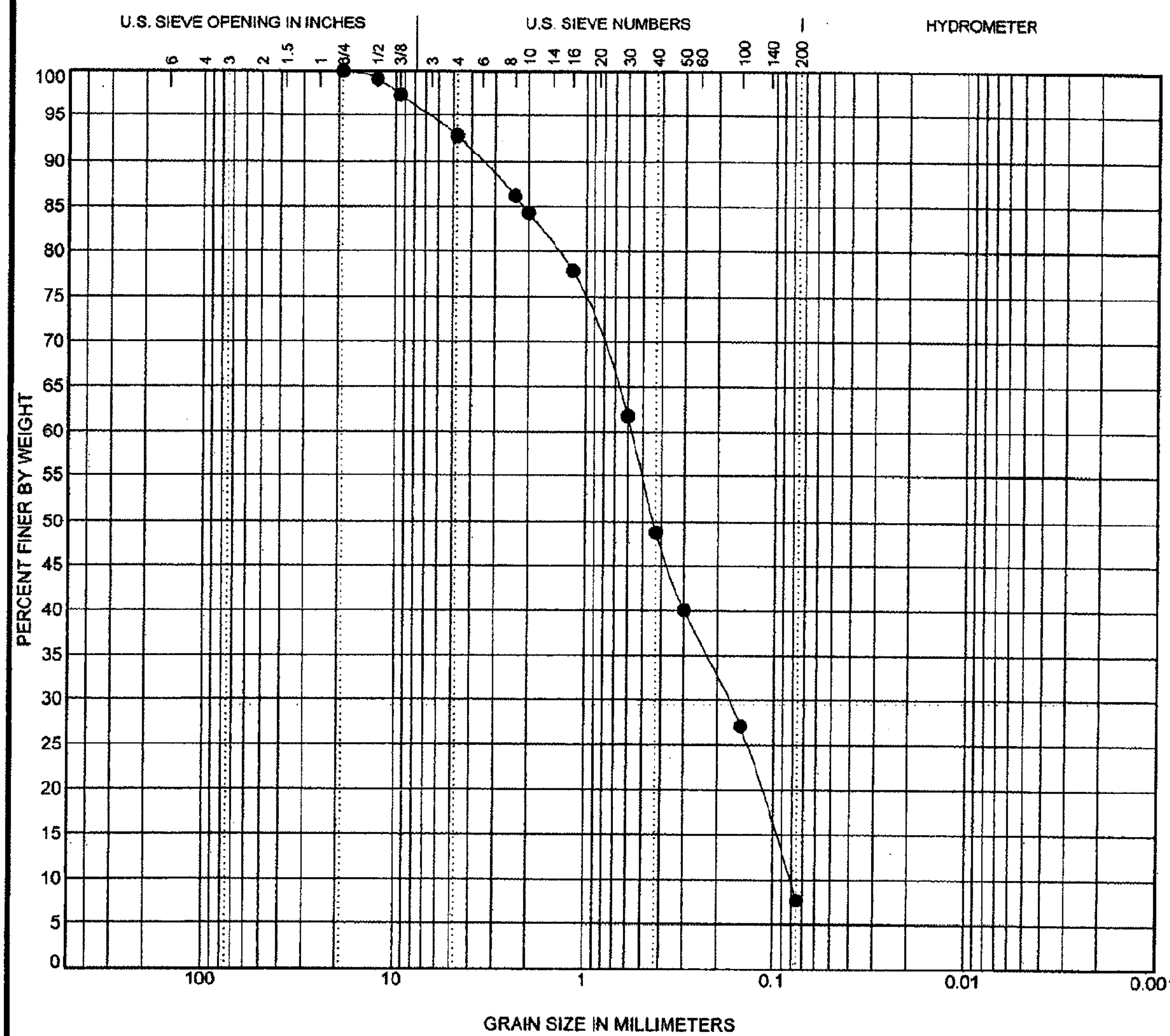
GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-D103-0-0350
Description	POORLY GRADED SAND (SP)
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/19/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				0.66	7.01	19	0.6	0.2	0.1	7.3	85.1	7.6	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
Location: Decatur, AL
Project Number: 020504-041

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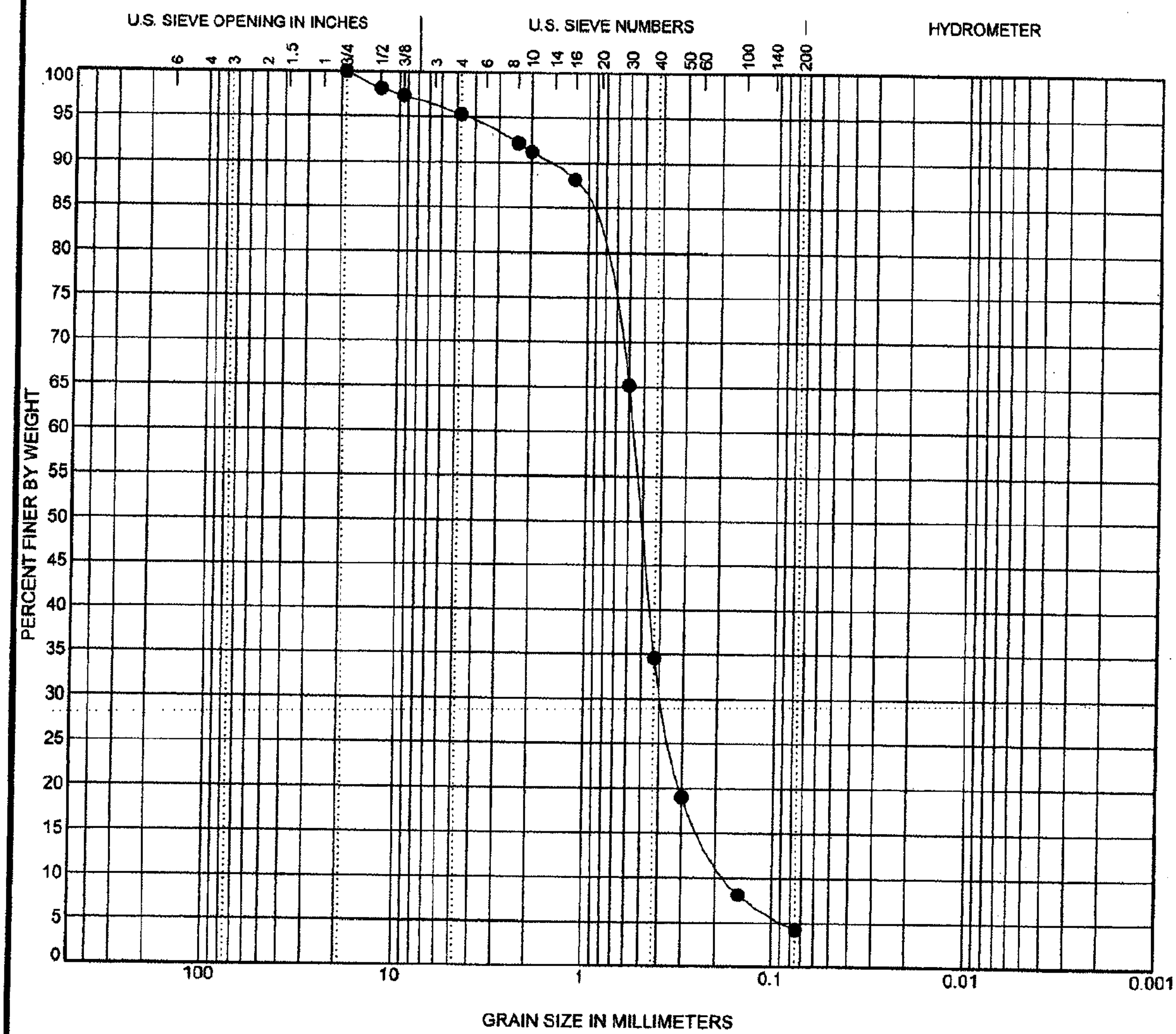
3MA01552373

GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-D103-0-0500
Description	POORLY GRADED SAND (SP)
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/19/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				1.54	3.34	19	0.6	0.4	0.2	4.7	91.0	4.3	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
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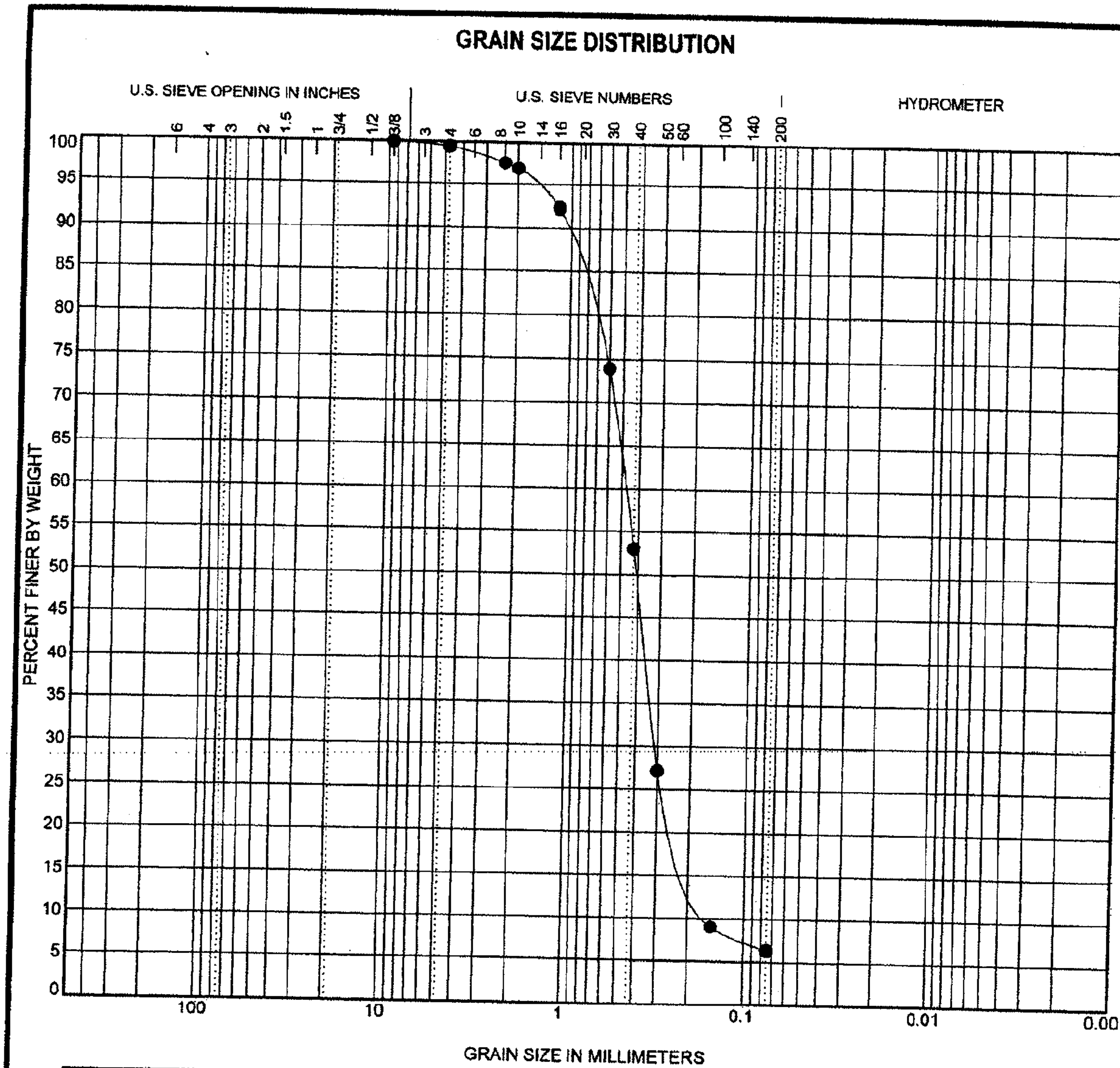
3MA01552374



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-D501-0-0150
Description	POORLY GRADED SAND (SP)
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/20/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				1.31	3.06	9.5	0.5	0.3	0.2	0.5	93.2	6.2	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
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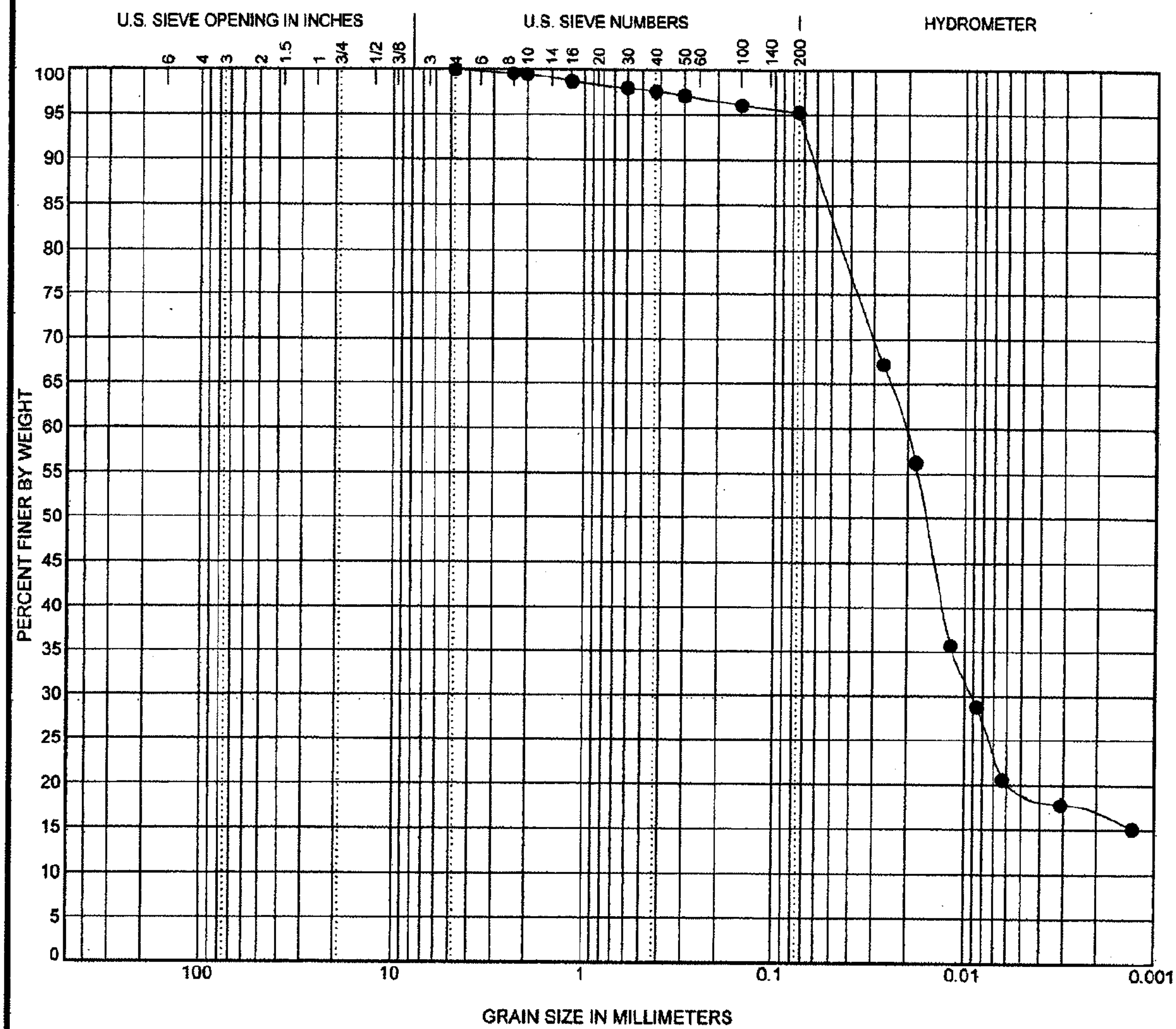
3MA01552375

GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-D801-0-0050
Description	% Silt - 76.3 % Clay - 19.0
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/20/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
						4.7	0	0		0.0	4.7	95.3	

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SIEVE ANALYSIS RESULTS

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Project: 3M - Borings
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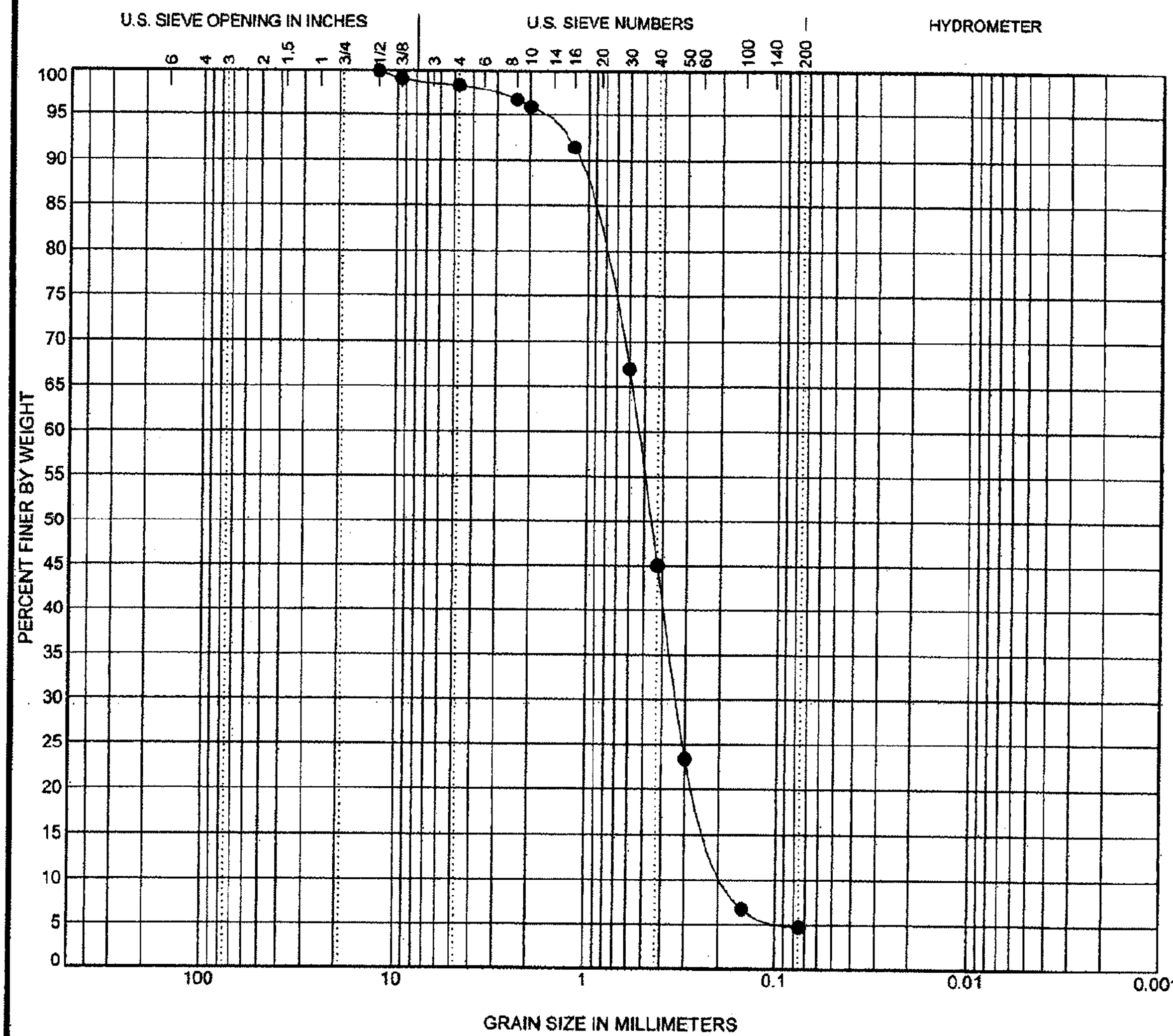
3MA01552376

GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-FTA02-0-0150
Description	POORLY GRADED SAND (SP)
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/23/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				1.21	3.12	12.5	0.5	0.3	0.2	1.7	93.6	4.8	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
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Project Number: 020504-041

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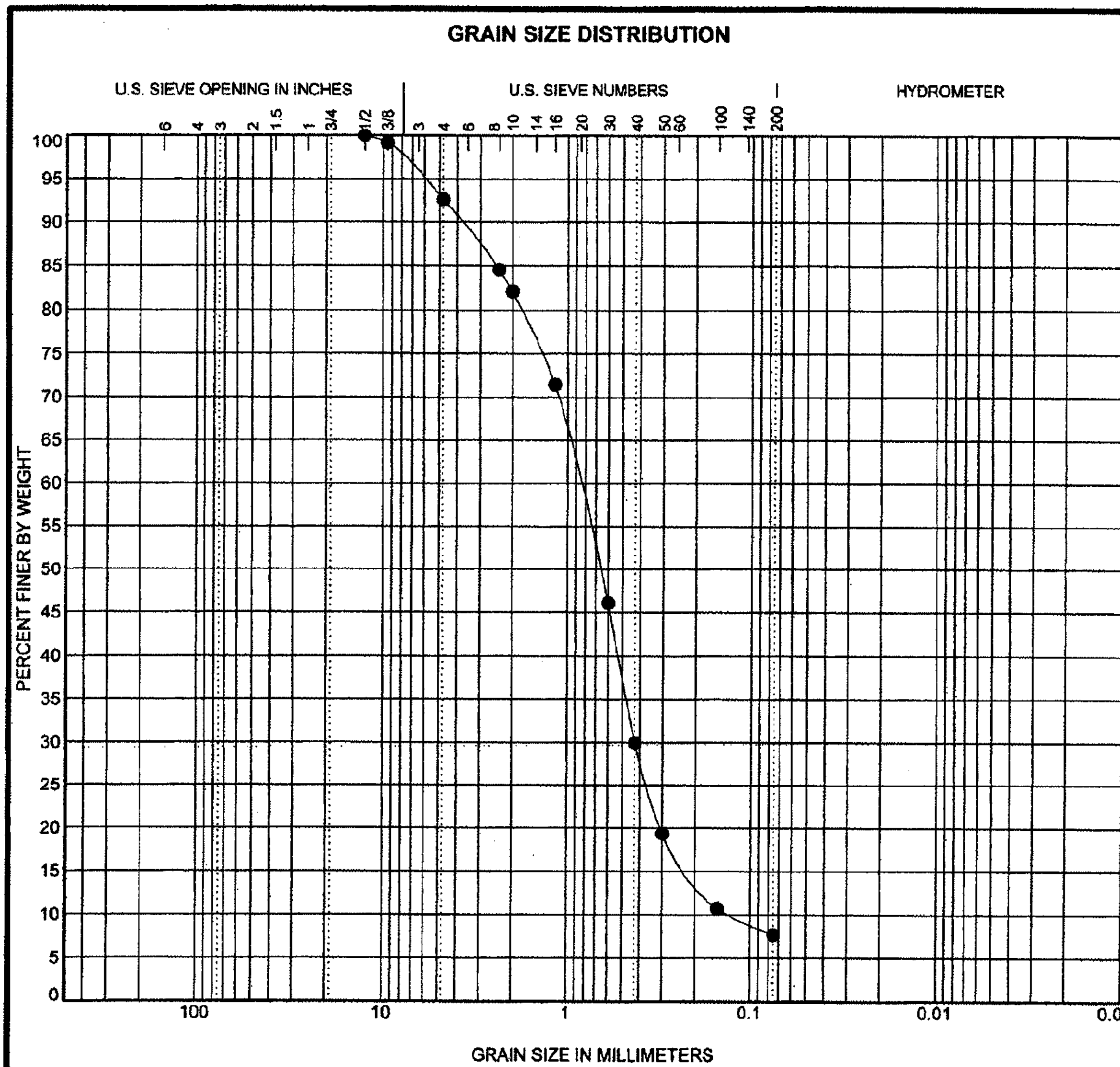

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-D101-0-0200
Description	POORLY GRADED SAND (SP)
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/24/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				1.63	6.83	12.5	0.9	0.4	0.1	7.3	85.0	7.6	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
Location: Decatur, AL
Project Number: 020504-041

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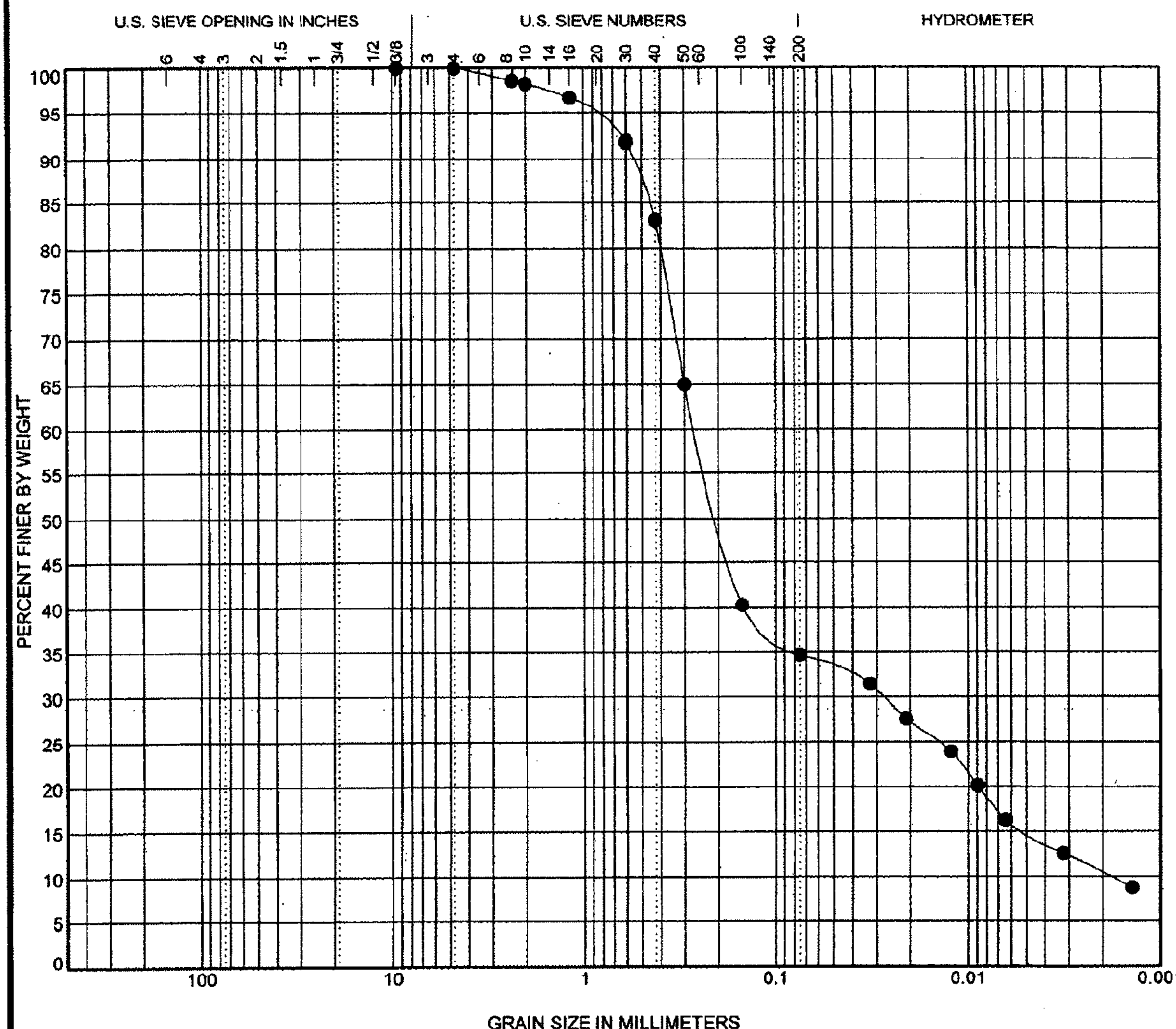
GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-WPA01-0-0150
Description	% Silt - 20.6 % Clay - 14.0
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/25/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				1.62	143.41	9.5	0.3	0	0	0.0	65.4	34.6	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
Location: Decatur, AL
Project Number: 020504-041

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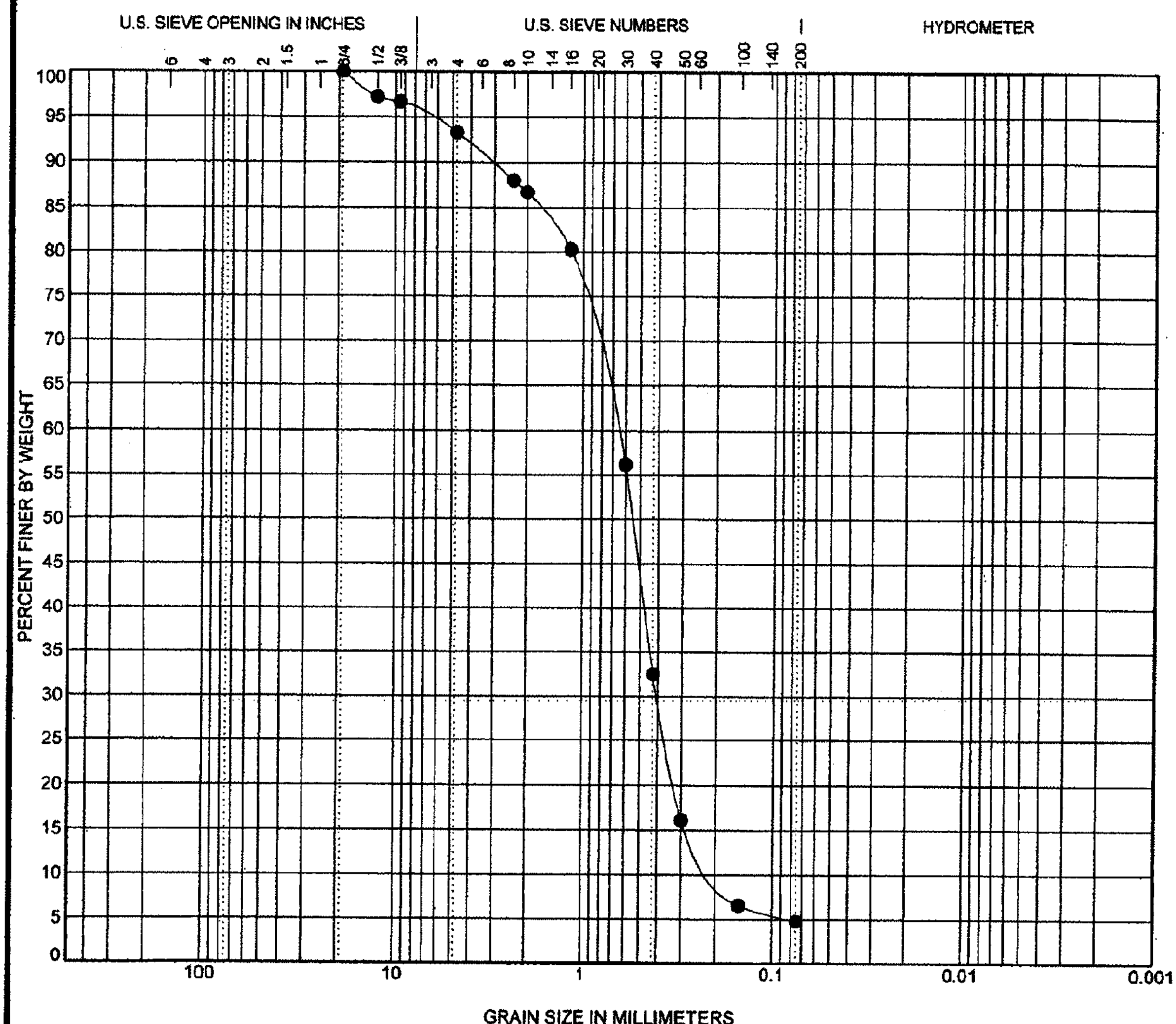
3MA01552379

GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-BKG01-0-0000
Description	POORLY GRADED SAND (SP)
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/25/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				1.26	3.47	19	0.7	0.4	0.2	6.6	88.6	4.8	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
Location: Decatur, AL
Project Number: 020504-041

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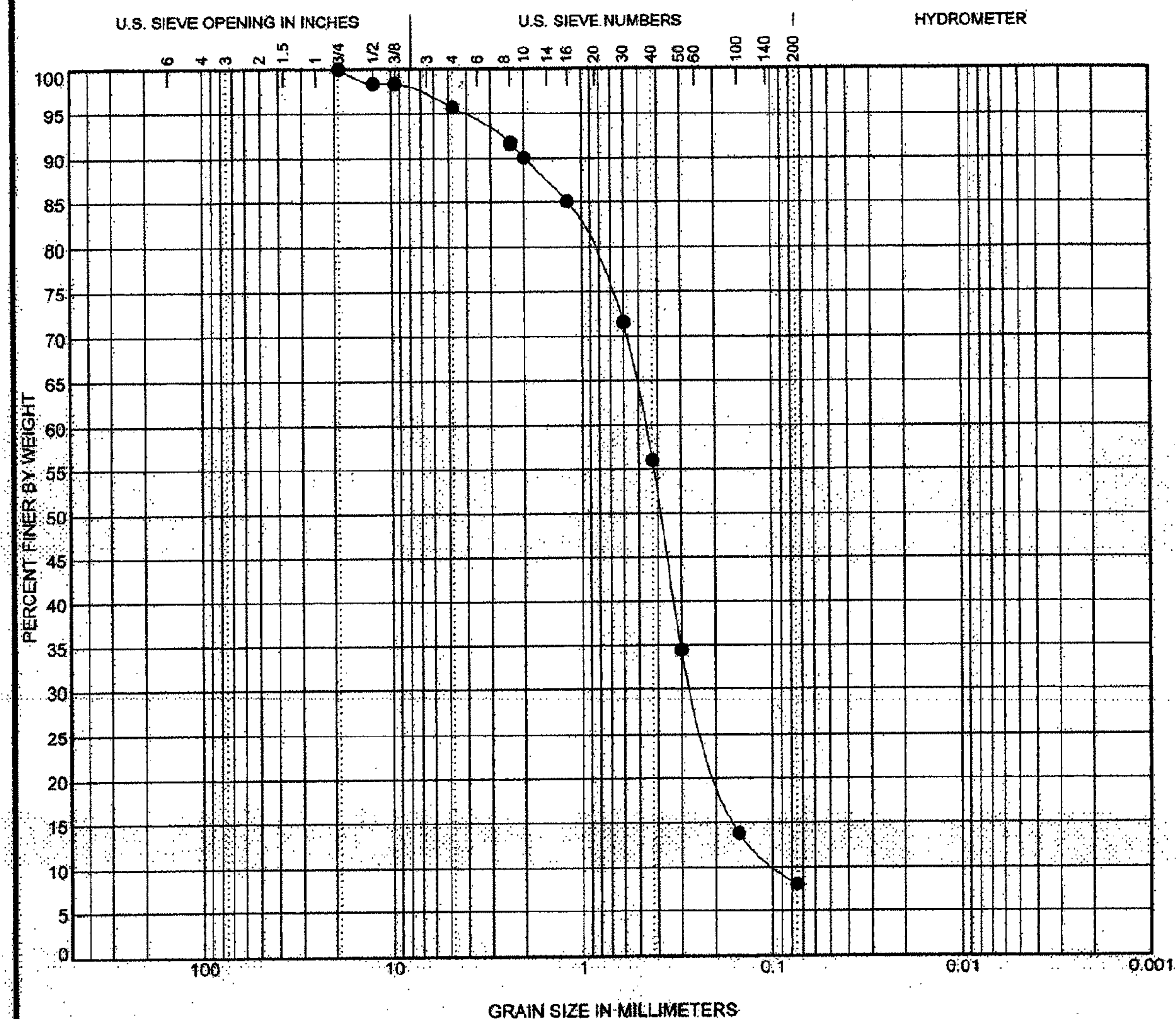
3MA01552380

GRAIN SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	CGMN-SBC-B1501-0-0100
Description	POORLY GRADED SAND (SP)
Sampled by:	Client
Sample Location:	onsite
Date Sampled:	5/25/2005

wc (%)	LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
				1.51	4.90	19	0.5	0.3	0.1	4.2	87.7	8.1	

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SIEVE ANALYSIS RESULTS

Client: Weston Solutions
Project: 3M - Borings
Location: Decatur, AL
Project Number: 020504-041

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