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Analytical Report

3M Company

Analysis of PFOA and PFOS In Water Samples from Hastings Municipality

E05-0186

Oxygen Report No. L0004709

Testing Laboratory

Oxygen Research
3058 Research Drive
State College, PA 16801

Requester

Gary A. Hohenstein
Manager, Environmental Operations
EHS Operations
3M Company
Building 42-2E-27
St. Paul, MN 55106

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1 Introduction

Results are reported for the analysis of perfluorooctanoate (PFOA) and perfluorooctanesulfonate (PFOS) in water samples received at Exygen as requested by Gary Hohenstein of 3M Company.

The Exygen project number assigned to the samples is L0004708. Table I lists the target analytes quantitated for the samples.

Table I. Target Analytes for Quantitation

<u>Parameter</u>	<u>Acronym</u>	<u>Formula</u>
Perfluorooctanoate	PFOA or C8 acid	$C_7F_{15}COO^-$
Perfluorooctanesulfonate	PFOS or C8 sulfonate	$C_8F_{17}SO_3^-$

2 Sample Receipt

Four samples were received at Exygen in 500 mL white plastic narrow-mouth bottles. At the request of 3M, all samples were analyzed. A copy of all sample log-in information is presented in Attachment A.

The samples were received on 03/01/05. The samples were shipped ambient via UPS. The samples were stored refrigerated from time of receipt until analysis.

3 Methods - Analytical and Preparatory

The Exygen method entitled, "Method of Analysis for the Determination of Perfluorooctane sulfonate (PFOS), Perfluorooctane sulfonylamide (PFOSA), and Perfluorooctanoate (POAA) in Water," modified for isomer separation, was used to prepare and analyze the samples. A summary of the sample preparation can be found in Section 3.1 and the modified analysis conditions for isomer separation can be found in Section 3.2.

3.1 Water Sample Preparation

Solid phase extraction (SPE) was used to prepare the water samples for LC/MS/MS analysis. Forty milliliters of the water sample was transferred to a C_{18} SPE cartridge. The cartridge was washed with 5 mL of a 40% methanol: 60% water wash. The cartridge was eluted with 5 mL of 100% methanol. A portion of the extract was transferred to autosampler vials and analyzed using electrospray LC/MS/MS.

3.2 Sample Analysis by LC/MS/MS

In High Pressure Liquid Chromatography (HPLC), an aliquot of extract is injected and passed through a liquid-phase chromatographic column. Based on the affinity of the analyte for the stationary phase in the column relative to the liquid mobile phase, the analyte is retained for a characteristic amount of time. Following HPLC separation, mass spectrometry provides a rapid and accurate means for analyzing a wide range of organic compounds. Molecules are ionized, fragmented, and detected. The ions characteristic of the compounds are observed and quantitated against extracted standards.

An HP1100 system interfaced to an Applied Biosystems API 4000 was used to analyze the sample extracts for quantitation.

Isomer separation was obtained using a gradient elution through a Thermo Flucophase RP, 50 x 2.1 mm x 5µm column. The sum of the isomers is reported as a single value for each of the analytes.

The following gradient was performed:

Mobile Phase (A): 2mM Ammonium Acetate in Water
Mobile Phase (B): Methanol

Time	%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

The following parameters were used for operation of the mass spectrometer:

Parameter	Setting
Ionization Mode	Electrospray
Polarity	Negative
Transitions Monitored	413->369 (PFOA), 499->80 (PFOS), 415->370 (¹³ C-PFOA, surrogate spike)
Gas Temperature	350°C
Drying Gas (N2)	7.0 L/min

4 Analysis

4.1 Calibration

A 7-point calibration curve was analyzed initially and throughout the analytical sequence for PFOA, PFOS and ¹³C PFOA. The calibration points were prepared at 0, 25, 50, 100, 250, 500, and 1000 ng/L (ppt) for LC/MS/MS analysis. Calibration standards are prepared using the same SPE procedure used for samples. The instrument response versus the concentration was plotted for each point. Using linear regression with 1/x weighting, the slope, y-intercept

and coefficient of determination (r^2) were determined. A calibration curve is acceptable if $r^2 \geq 0.985$.

For the results reported here, calibration criteria were met. The calibration curves are included in the raw data in Attachment C.

4.2 Surrogates

^{13}C PFOA ($\text{C}_8\text{F}_{15}[^{13}\text{C}]\text{F}_2[^{13}\text{C}]\text{OOH}$) is used as a surrogate for the water samples. ^{13}C PFOA was added to the empty sample containers before the bottles were sent to the field for sampling. In the field, all sample and quality control bottles were filled to a volumetric fill line with the sample.

^{13}C PFOA recoveries can be found in Attachment B.

4.3 Laboratory Control Spikes

Laboratory control spikes in the analytical set were prepared by adding a known concentration of PFOA, ^{13}C PFOA, and PFOS to laboratory reagents. Laboratory control spikes are used to assess method accuracy. The laboratory control spikes must show recoveries between 70-130% or the data is rejected. For the results reported here, the laboratory control spikes were within the acceptable range.

4.4 Field Matrix Spikes

A low and a high matrix spike were prepared with the sample and sample duplicate in the field. Compounds were added to the empty sample containers before the bottles were sent to the field for sampling. Matrix spikes are used to assess method accuracy in the matrix. The matrix spikes should show recoveries between 70-130%. For the results reported here, the matrix spikes were within the acceptable range.

4.5 Sample Related Comments

The water samples were collected in duplicate. Duplicate sample results are reported in Attachment B.

5 Data Summary

Please see Attachment B for a detailed listing of the analytical results. The results are reported in parts per billion (ng/mL) for PFOA and PFOS.

6 Statement of Accuracy

Based on results of laboratory control spikes, field matrix spikes, and surrogate spikes, the analytical accuracy for PFOS and PFOA results is $\pm 30\%$. Laboratory control spikes, surrogate spikes, and field matrix spikes showed recoveries within this range.

Specific sample recoveries are given in Attachment B.

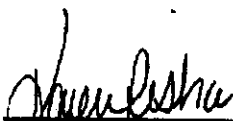
7 Data/Sample Retention

Samples will be returned to 3M 60 days after final reporting. All electronic data is archived on retrievable media and hard copy reports are stored in data folders maintained by Exygen. Hardcopy data is stored for a minimum of five years. The client will be notified 30 days prior to the disposal of hardcopy data.

8 Attachments

- 7.1 Attachment A: Analytical Results
- 7.2 Attachment B: Spike Recovery Data
- 7.3 Attachment C: Chain of Custody Forms
- 7.4 Attachment D: Raw Analytical Data

9 Signatures


Karen Risha, Principal Investigator

03/14/05
Date


John M. Flaherty, Vice President

3/14/05
Date

SECTION A

Summary of PFOA and PFOS in Water Samples E05-0186

Oxygen ID	Sample ID	Analyte Found (ng/mL)	
		C8 Acid PFOA Perfluorooctanoate	C8 Sulfonate PFOS Perfluorooctanesulfonate
L4709-1	H-W6-207643	ND	ND
L4709-2	H-W6-207643 Dup	ND	ND

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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SECTION B

Field Matrix Spike Recovery Summary for PFOA and PFOS in Water E05-0186

Sample Description	Amount Spiked (ng/mL)	C8 Acid PFOA			C8 Sulfonate PFOS		
		Amt Found in Sample (ng/mL)	Amount Recovered (ng/mL)	Recovery (%)	Amt Found in Sample (ng/mL)	Amount Recovered (ng/mL)	Recovery (%)
H-W6-207643 Low Spike (L4146-3, 0.1 ppb Spike)	0.1	ND	0.128	128	ND	0.117	117
H-W6-207643 High Spike (L4146-4, 1 ppb Spike)	1	ND	1.04	104	ND	1.03	103

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.

Surrogate Spike Recovery Summary for ¹³C-PFOA In Water E05-0186

Exygen ID	Sample Description	¹³ C-PFOA		
		Amount Spiked (ng/mL)	Amount Recovered (ng/mL)	Recovery (%)
L4709-1	H-W6-207643	0.5	0.491	98
L4709-2	H-W6-207643 Dup	0.5	0.522	104
L4709-3	H-W6-207643 Low Spk	0.5	0.546	109
L4709-4	H-W6-207643 High Spk	0.5	0.540	108

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SECTION C



3058 Research Drive
State College, PA 16801

Phone: 814-272-1039
Fax: 814-231-1580

Login

Login Group: L0004709

Login #: 4819
Project: P0001275
Company Name: 3M
Submitted By: KENT LINDSTROM
Login Type: Immediate Receipt of Samples
Started: True
Date Start: 03/01/2005
Due Date: 03/11/2005
Received Date: 03/01/2005
Received By: Ammerman, Mark
Spread Sample:
Label:
Exygen SD/PI: Risha, Karen
Project Title/Type: Cottage Grove Residential Water Sampling / ROUTINE
Login Notes:
Conform Notes:

Conform COC Sample: True
Conform COC: True
Conform Sample: True
Conform Request: True

Packages / Containers

<u>Package</u>	<u>Carton</u>	<u>Date / Condition</u>	<u>Shipper / ID</u>	<u>Temp. Control/Temp.</u>	<u>Direction / Handled By</u>	
PK0005560		Login Date: 3/1/2005 11:31:46AM Package & Contents Uncompromised	UPS 1Z57955E0142913994	None 22.3	RECEIVED Ammernan, Mark	
<u>Container #</u>	<u>Gross Weight</u>	<u>pH</u>	<u>Container Type</u>	<u>Preservative</u>	<u>Mfg. Lot</u>	<u>Mfg. ID</u>
C0063087	253.90 g		500 ml Clear Plastic Narrow	NONE		
C0063088	259.00 g		500 ml Clear Plastic Narrow	NONE		
PK0005561		Login Date: 3/1/2005 11:34:38AM Package & Contents Uncompromised	UPS 1Z57955E0140875806	None 22.3	RECEIVED Ammernan, Mark	
<u>Container #</u>	<u>Gross Weight</u>	<u>pH</u>	<u>Container Type</u>	<u>Preservative</u>	<u>Mfg. Lot</u>	<u>Mfg. ID</u>
C0063089	252.90 g		500 ml Clear Plastic Narrow	NONE		
C0063090	244.40 g		500 ml Clear Plastic Narrow	NONE		

Samples

Sample ID	Container	Matrix	Fraction	Sample	Date Sampled	Date Loaded In	Date Due
L0004709-0001	C0063087	LIQUID	Water	HW6-207643	02/28/2005	03/01/2005	03/11/2005
L0004709-0002	C0063089	LIQUID	Water	HW6-207643 Dup	02/28/2005	03/01/2005	03/11/2005
L0004709-0003	C0063088	LIQUID	Water	HW6-207643 Low Spike	02/28/2005	03/01/2005	03/11/2005
L0004709-0004	C0063090	LIQUID	Water	HW6-207643 High Spike	02/28/2005	03/01/2005	03/11/2005

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Instance: R0149340

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 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1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2

Login

Login Reviewed By:

96

Date/Time:

3-1-05

1155

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3/1/2005
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Instance:

R0149340



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3M Environmental Laboratory

Form 38776 - PWS

Shipping Address:
3M Bldg. 2-35-09
330 Bush Avenue
St. Paul, MN 55108
Telephone:
Sample Receiving: (651) 779-4848
Alternate: (651) 779-4753
FAX: (651) 779-6178

Chain of Custody / Request for Laboratory Analytical

08547

Project ID/Project Name: Hastings Municipal Well Field
Template #: FE-3.11
Project Lead: Kent Lindstrom
Dept. # (main): 530711
Class/Job/Project #: 002267449

EOS-0186

Contact Name: Gary Hohenstein
Company: 3M

Mailing Address

City, State, Zip

Telephone #

FAX #

Date Available

Date Due

Contract Lab

7/1

7/3

Exyjen

Special instructions and/or Specific Regulatory Requirements:
(method, limit of detection, reporting units, etc.)

* Note: Reference Trip Blank on EOS-0184
EOS 2/24/05

Analysis Requested:

Complete below. Attach any associated information.

Total Number of Containers

Preservatives:

HNO₃ H₂SO₄ VOA None Other

Enter the number of containers of each

(Enter an 'X' in the box below to indicate request)

Matrix/
Media

Time
Sampled

Date
Sampled

3M
LIMS#

Client Sample Identification

Item #

1.

HW6-207643

77868

2/28/05

1124

OC

1

1

1

1

1

1

2.

HW6-207643 dup

77869

1124

OC

1

1

1

1

1

1

1

1

3.

HW6-207643 Low Spike

OC

1124

OC

1

1

1

1

1

1

1

1

4.

HW6-207643 High Spike

OC

1124

OC

1

1

1

1

1

1

1

1

5.

6.

7.

8.

9.

10.

Collected by (print): Brad Jacobson

Item #

1-4

1252

2/28/05

Self

1320

2/28/05

UPS AM

1320

2/28/05

1320

2/28/05

1320

2/28/05

Sample Condition Upon Receipt: ☒ Acceptable ☐ Other:

Temperature: 1 °C

Other Associated CoCs: None

Comments: * TO EXYGEN

Collector's signature: Brad Jacobson

Stopped by: Self

Date: 2/28/05

Time: 1320

Signature: Exyjen

Date: 2/28/05

Time: 1320

Signature: Exyjen

Date: 2/28/05

2/28/2005

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3M ENVIRONMENTAL LABORATORY
CONTRACT LABORATORY WORK ORDER BY SAMPLE

Project: E05-0186

Contract Lab(s): EXYGEN

Requester: Hohenstein, Gary A (0042-02E-27)

Department: 530711

Project Number: 0022674449

Date Received: 2/25/2005

Project Description: Hastings Municipal Well FC's 11

Completion Date:

Project Lead: Kent Lindstrom

Phone Number: 651-778-5352

Email Address: krlindstrom@mmm.com

Ship Date:

2/28/05

Comments:

Pace field sampling.

Note: Reference trip blank on E05-0184. BGJ 2/28/05

E05-0186 samples traveled with E05-0184 samples. AC, PLF, 2/28/2005.

3M Sample Number	Sampled Date	Sample Description	
E05-0186-79868	2/28/2005	H-W6-207643	
<u>Analysis Code</u>	<u>Analytical Method</u>	<u>Components</u>	<u>Analysis Due Date</u>
PFOA	PFOA	PFOA	3/15/2005
PFOS	PFOS by ESMS	PFOS	3/15/2005
E05-0186-79869	2/28/2005	H-W6-207643 Dup	
<u>Analysis Code</u>	<u>Analytical Method</u>	<u>Components</u>	<u>Analysis Due Date</u>
PFOA	PFOA	PFOA	3/15/2005
PFOS	PFOS by ESMS	PFOS	3/15/2005

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