



**Off-Base Drinking Water Sample Results,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Figure, SDG 320-45882-1**

*Naval Air Station Willow Grove
Willow Grove, Pennsylvania*

August 2019

"WGNA-120518-RW-0263", "537", "RES", "320-45882-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "14.1", "ng/L", "", "0.943", "DL", "", "TRG", "", "", "4.96", "LOQ", "YES", "-99", "", "251.9", "10.00", "1.98", ""

"WGNA-120518-RW-0263", "537", "RES", "320-45882-1", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "14.2", "ng/L", "M", "2.68", "DL", "", "TRG", "", "", "6.95", "LOQ", "YES", "-99", "", "251.9", "10.00", "5.95", ""

"WGNA-120518-RW-0263", "537", "RES", "320-45882-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "6.95", "ng/L", "", "0.635", "DL", "", "TRG", "", "", "4.96", "LOQ", "YES", "-99", "", "251.9", "10.00", "1.98", ""

"WGNA-120518-RW-0263", "537", "RES", "320-45882-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "14.7", "ng/L", "", "0.794", "DL", "", "TRG", "", "", "4.96", "LOQ", "YES", "-99", "", "251.9", "10.00", "1.98", ""

"WGNA-120518-RW-0263", "537", "RES", "320-45882-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "3.19", "ng/L", "J", "1.29", "DL", "", "TRG", "", "", "4.96", "LOQ", "YES", "-99", "", "251.9", "10.00", "2.98", ""

"WGNA-120518-RW-0263", "537", "RES", "320-45882-1", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "0.817", "ng/L", "J", "0.466", "DL", "", "TRG", "", "", "4.96", "LOQ", "YES", "-99", "", "251.9", "10.00", "0.992", ""

"WGNA-120518-RW-0263", "537", "RES", "320-45882-1", "TALSAC", "STL00993", "13C2 PFHxA", "95.1", "ng/L", "", "-99", "DL", "", "SURR", "96", "", "-99", "LOQ", "YES", "99.2", "", "251.9", "10.00", "0", ""

"WGNA-120518-RW-0263", "537", "RES", "320-45882-1", "TALSAC", "STL00996", "13C2 PFDA", "81.7", "ng/L", "", "-99", "DL", "", "SURR", "82", "", "-99", "LOQ", "YES", "99.2", "", "251.9", "10.00", "0", ""

"NAWC-120518-FRB-082", "537", "RES", "320-45882-10", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "1.74", "ng/L", "U", "0.828", "DL", "", "TRG", "", "", "4.36", "LOQ", "YES", "-99", "", "286.7", "10.00", "1.74", ""

"NAWC-120518-FRB-082", "537", "RES", "320-45882-10", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "5.23", "ng/L", "U M", "2.35", "DL", "", "TRG", "", "", "6.10", "LOQ", "YES", "-99", "", "286.7", "10.00", "5.23", ""

"NAWC-120518-FRB-082", "537", "RES", "320-45882-10", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "1.74", "ng/L", "U", "0.558", "DL", "", "TRG", "", "", "4.36", "LOQ", "YES", "-99", "", "286.7", "10.00", "1.74", ""

"NAWC-120518-FRB-082", "537", "RES", "320-45882-10", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "1.74", "ng/L", "U", "0.698", "DL", "", "TRG", "", "", "4.36", "LOQ", "YES", "-99", "", "286.7", "10.00", "1.74", ""

"NAWC-120518-FRB-082", "537", "RES", "320-45882-10", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "2.62", "ng/L", "U", "1.13", "DL", "", "TRG", "", "", "4.36", "LOQ", "YES", "-99", "", "286.7", "10.00", "2.62", ""

"NAWC-120518-FRB-082", "537", "RES", "320-45882-10", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "0.872", "ng/L", "U", "0.410", "DL", "", "TRG", "", "", "4.36", "LOQ", "YES", "-99", "", "286.7", "10.00", "0.872", ""

"NAWC-120518-FRB-082", "537", "RES", "320-45882-10", "TALSAC", "STL00993", "13C2 PFHxA", "85.0", "ng/L", "", "-99", "DL", "", "SURR", "98", "", "-99", "LOQ", "YES", "87.2", "", "286.7", "10.00", "0", ""

"NAWC-120518-FRB-082", "537", "RES", "320-45882-10", "TALSAC", "STL00996", "13C2 PFDA", "81.4", "ng/L", "", "-99", "DL", "", "SURR", "93", "", "-99", "LOQ", "YES", "87.2", "", "286.7", "10.00", "0", ""

"WGNA-120518-RW-0413", "537", "RES", "320-45882-11", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "22.0", "ng/L", "", "0.808", "DL", "", "TRG", "", "", "4.25", "LOQ", "YES", "-99", "", "293.8", "10.00", "1.70", ""

"WGNA-120518-RW-0413", "537", "RES", "320-45882-11", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "20.1", "ng/L", "M", "2.30", "DL", "", "TRG", "", "", "5.96", "LOQ", "YES", "-99", "", "293.8", "10.00", "5.11", ""

"WGNA-120518-RW-0413", "537", "RES", "320-45882-11", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "6.56", "ng/L", "", "0.545", "DL", "", "TRG", "", "", "4.25", "LOQ", "YES", "-99", "", "293.8", "10.00", "1.70", ""

"WGNA-120518-RW-0413", "537", "RES", "320-45882-11", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "7.78", "ng/L", "", "0.681", "DL", "", "TRG", "", "", "4.25", "LOQ", "YES", "-99", "", "293.8", "10.00", "1.70", ""

"WGNA-120518-RW-0413", "537", "RES", "320-45882-11", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "5.90", "ng/L", "", "1.11", "DL", "", "TRG", "", "", "4.25", "LOQ", "YES", "-99", "", "293.8", "10.00", "2.55", ""

"WGNA-120518-RW-0413", "537", "RES", "320-45882-11", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "2.82", "ng/L", "J", "0.400", "DL", "", "TRG", "", "", "4.25", "LOQ", "YES", "-99", "", "293.8", "10.00", "0.851", ""

"WGNA-120518-RW-0413", "537", "RES", "320-45882-11", "TALSAC", "STL00993", "13C2 PFHxA", "80.3", "ng/L", "", "-99", "DL", "", "SURR", "94", "", "-99", "LOQ", "YES", "85.1", "", "293.8", "10.00", "0", ""

"WGNA-120518-RW-0413", "537", "RES", "320-45882-11", "TALSAC", "STL00996", "13C2 PFDA", "78.5", "ng/L", "", "-99", "DL", "", "SURR", "92", "", "-99", "LOQ", "YES", "85.1", "", "293.8", "10.00", "0", ""

"WGNA-120518-FRB-0413", "537", "RES", "320-45882-12", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "1.76", "ng/L", "U", "0.837", "DL", "", "TRG", "", "", "4.40", "LOQ", "YES", "-99", "", "283.9", "10.00", "1.76", ""

"WGNA-120518-FRB-0413", "537", "RES", "320-45882-12", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "5.28", "ng/L", "U M", "2.38", "DL", "", "TRG", "", "", "6.16", "LOQ", "YES", "-99", "", "283.9", "10.00", "5.28", ""

"WGNA-120518-FRB-0413", "537", "RES", "320-45882-12", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid

(PFHxS),"1.76","ng/L","U","0.564","DL","","TRG","","","4.40","LOQ","YES","-99","","283.9","10.00","1.76",""
"WGNA-120518-FRB-0413","537","RES","320-45882-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"1.76","ng/L","U","0.704","DL","","TRG","","","4.40","LOQ","YES","-99","","283.9","10.00","1.76",""
"WGNA-120518-FRB-0413","537","RES","320-45882-12","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"2.64","ng/L","U M","1.14","DL","","TRG","","","4.40","LOQ","YES","-99","","283.9","10.00","2.64",""
"WGNA-120518-FRB-0413","537","RES","320-45882-12","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"0.881","ng/L","U","0.414","DL","","TRG","","","4.40","LOQ","YES","-99","","283.9","10.00","0.881",""
"WGNA-120518-FRB-0413","537","RES","320-45882-12","TALSAC","STL00993","13C2
PFHxA","78.2","ng/L","","-99","DL","","SURR","89","","-99","LOQ","YES","88.1","","283.9","10.00","0",""
"WGNA-120518-FRB-0413","537","RES","320-45882-12","TALSAC","STL00996","13C2
PFDA","73.3","ng/L","","-99","DL","","SURR","83","","-99","LOQ","YES","88.1","","283.9","10.00","0",""
"WGNA-120518-DUP-53","537","RES","320-45882-13","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"13.4","ng/L","","0.923","DL","","TRG","","","4.86","LOQ","YES","-99","","257.4","10.00","1.94",""
"WGNA-120518-DUP-53","537","RES","320-45882-13","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"14.4","ng/L","M","2.62","DL","","TRG","","","6.80","LOQ","YES","-99","","257.4","10.00","5.83",""
"WGNA-120518-DUP-53","537","RES","320-45882-13","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"7.41","ng/L","","0.622","DL","","TRG","","","4.86","LOQ","YES","-99","","257.4","10.00","1.94",""
"WGNA-120518-DUP-53","537","RES","320-45882-13","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"15.0","ng/L","","0.777","DL","","TRG","","","4.86","LOQ","YES","-99","","257.4","10.00","1.94",""
"WGNA-120518-DUP-53","537","RES","320-45882-13","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"3.40","ng/L","J","1.26","DL","","TRG","","","4.86","LOQ","YES","-99","","257.4","10.00","2.91",""
"WGNA-120518-DUP-53","537","RES","320-45882-13","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"0.923","ng/L","J","0.456","DL","","TRG","","","4.86","LOQ","YES","-99","","257.4","10.00","0.971",""
"WGNA-120518-DUP-53","537","RES","320-45882-13","TALSAC","STL00993","13C2
PFHxA","91.4","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","97.1","","257.4","10.00","0",""
"WGNA-120518-DUP-53","537","RES","320-45882-13","TALSAC","STL00996","13C2
PFDA","81.1","ng/L","","-99","DL","","SURR","84","","-99","LOQ","YES","97.1","","257.4","10.00","0",""
"WGNA-120518-FRB-0263","537","RES","320-45882-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"1.76","ng/L","U","0.837","DL","","TRG","","","4.40","LOQ","YES","-99","","283.9","10.00","1.76",""
"WGNA-120518-FRB-0263","537","RES","320-45882-2","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"5.28","ng/L","U M","2.38","DL","","TRG","","","6.16","LOQ","YES","-99","","283.9","10.00","5.28",""
"WGNA-120518-FRB-0263","537","RES","320-45882-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"1.76","ng/L","U","0.564","DL","","TRG","","","4.40","LOQ","YES","-99","","283.9","10.00","1.76",""
"WGNA-120518-FRB-0263","537","RES","320-45882-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"1.76","ng/L","U","0.704","DL","","TRG","","","4.40","LOQ","YES","-99","","283.9","10.00","1.76",""
"WGNA-120518-FRB-0263","537","RES","320-45882-2","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"2.64","ng/L","U","1.14","DL","","TRG","","","4.40","LOQ","YES","-99","","283.9","10.00","2.64",""
"WGNA-120518-FRB-0263","537","RES","320-45882-2","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"0.881","ng/L","U","0.414","DL","","TRG","","","4.40","LOQ","YES","-99","","283.9","10.00","0.881",""
"WGNA-120518-FRB-0263","537","RES","320-45882-2","TALSAC","STL00993","13C2
PFHxA","89.5","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","88.1","","283.9","10.00","0",""
"WGNA-120518-FRB-0263","537","RES","320-45882-2","TALSAC","STL00996","13C2
PFDA","86.4","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","88.1","","283.9","10.00","0",""
"NAWC-120518-RW-154","537","RES","320-45882-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"16.0","ng/L","","0.887","DL","","TRG","","","4.67","LOQ","YES","-99","","267.7","10.00","1.87",""
"NAWC-120518-RW-154","537","RES","320-45882-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"23.6","ng/L","M","2.52","DL","","TRG","","","6.54","LOQ","YES","-99","","267.7","10.00","5.60",""
"NAWC-120518-RW-154","537","RES","320-45882-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"4.63","ng/L","J","0.598","DL","","TRG","","","4.67","LOQ","YES","-99","","267.7","10.00","1.87",""
"NAWC-120518-RW-154","537","RES","320-45882-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"9.03","ng/L","","0.747","DL","","TRG","","","4.67","LOQ","YES","-99","","267.7","10.00","1.87",""
"NAWC-120518-RW-154","537","RES","320-45882-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"8.00","ng/L","","1.21","DL","","TRG","","","4.67","LOQ","YES","-99","","267.7","10.00","2.80",""
"NAWC-120518-RW-154","537","RES","320-45882-3","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA),"1.86","ng/L","J","0.439","DL","","TRG","","","4.67","LOQ","YES","-99","","267.7","10.00","0.934","","
"NAWC-120518-RW-154","537","RES","320-45882-3","TALSAC","STL00993","13C2
PFHxA","89.9","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","93.4","","267.7","10.00","0","","
"NAWC-120518-RW-154","537","RES","320-45882-3","TALSAC","STL00996","13C2
PFDA","92.5","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","93.4","","267.7","10.00","0","","
"NAWC-120518-FRB-154","537","RES","320-45882-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","1.74","ng/L","U","0.826","DL","","TRG","","","4.34","LOQ","YES","-99","","287.7","10.00","1.74","","
"NAWC-120518-FRB-154","537","RES","320-45882-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","5.21","ng/L","U M","2.35","DL","","TRG","","","6.08","LOQ","YES","-99","","287.7","10.00","5.21","","
"NAWC-120518-FRB-154","537","RES","320-45882-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","1.74","ng/L","U","0.556","DL","","TRG","","","4.34","LOQ","YES","-99","","287.7","10.00","1.74","","
"NAWC-120518-FRB-154","537","RES","320-45882-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","1.74","ng/L","U","0.695","DL","","TRG","","","4.34","LOQ","YES","-99","","287.7","10.00","1.74","","
"NAWC-120518-FRB-154","537","RES","320-45882-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","2.61","ng/L","U","1.13","DL","","TRG","","","4.34","LOQ","YES","-99","","287.7","10.00","2.61","","
"NAWC-120518-FRB-154","537","RES","320-45882-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.869","ng/L","U","0.408","DL","","TRG","","","4.34","LOQ","YES","-99","","287.7","10.00","0.869","","
"NAWC-120518-FRB-154","537","RES","320-45882-4","TALSAC","STL00993","13C2
PFHxA","82.5","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","86.9","","287.7","10.00","0","","
"NAWC-120518-FRB-154","537","RES","320-45882-4","TALSAC","STL00996","13C2
PFDA","78.1","ng/L","","-99","DL","","SURR","90","","-99","LOQ","YES","86.9","","287.7","10.00","0","","
"WGNA-120518-RW-0533","537","RES","320-45882-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","21.1","ng/L","","0.795","DL","","TRG","","","4.18","LOQ","YES","-99","","298.8","10.00","1.67","","
"WGNA-120518-RW-0533","537","RES","320-45882-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","23.3","ng/L","M","2.26","DL","","TRG","","","5.86","LOQ","YES","-99","","298.8","10.00","5.02","","
"WGNA-120518-RW-0533","537","RES","320-45882-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","10.1","ng/L","","0.535","DL","","TRG","","","4.18","LOQ","YES","-99","","298.8","10.00","1.67","","
"WGNA-120518-RW-0533","537","RES","320-45882-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","9.08","ng/L","","0.669","DL","","TRG","","","4.18","LOQ","YES","-99","","298.8","10.00","1.67","","
"WGNA-120518-RW-0533","537","RES","320-45882-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","5.00","ng/L","","1.09","DL","","TRG","","","4.18","LOQ","YES","-99","","298.8","10.00","2.51","","
"WGNA-120518-RW-0533","537","RES","320-45882-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","2.53","ng/L","J","0.393","DL","","TRG","","","4.18","LOQ","YES","-99","","298.8","10.00","0.837","","
"WGNA-120518-RW-0533","537","RES","320-45882-5","TALSAC","STL00993","13C2
PFHxA","78.4","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","83.7","","298.8","10.00","0","","
"WGNA-120518-RW-0533","537","RES","320-45882-5","TALSAC","STL00996","13C2
PFDA","71.8","ng/L","","-99","DL","","SURR","86","","-99","LOQ","YES","83.7","","298.8","10.00","0","","
"WGNA-120518-FRB-0533","537","RES","320-45882-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","1.81","ng/L","U","0.859","DL","","TRG","","","4.52","LOQ","YES","-99","","276.4","10.00","1.81","","
"WGNA-120518-FRB-0533","537","RES","320-45882-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","5.43","ng/L","U M","2.44","DL","","TRG","","","6.33","LOQ","YES","-99","","276.4","10.00","5.43","","
"WGNA-120518-FRB-0533","537","RES","320-45882-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","1.81","ng/L","U","0.579","DL","","TRG","","","4.52","LOQ","YES","-99","","276.4","10.00","1.81","","
"WGNA-120518-FRB-0533","537","RES","320-45882-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","1.81","ng/L","U","0.724","DL","","TRG","","","4.52","LOQ","YES","-99","","276.4","10.00","1.81","","
"WGNA-120518-FRB-0533","537","RES","320-45882-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","2.71","ng/L","U","1.18","DL","","TRG","","","4.52","LOQ","YES","-99","","276.4","10.00","2.71","","
"WGNA-120518-FRB-0533","537","RES","320-45882-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.904","ng/L","U","0.425","DL","","TRG","","","4.52","LOQ","YES","-99","","276.4","10.00","0.904","","
"WGNA-120518-FRB-0533","537","RES","320-45882-6","TALSAC","STL00993","13C2
PFHxA","95.4","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","90.4","","276.4","10.00","0","","
"WGNA-120518-FRB-0533","537","RES","320-45882-6","TALSAC","STL00996","13C2
PFDA","88.4","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","90.4","","276.4","10.00","0","","
"NAWC-120518-RW-081","537","RES","320-45882-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid

(PFOS),"18.8","ng/L",,"0.815","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.3","10.00","1.72",""
"NAWC-120518-RW-081","537","RES","320-45882-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"14.4","ng/L","M","2.32","DL",,"TRG",,"","6.01","LOQ","YES",-99,"291.3","10.00","5.15",""
"NAWC-120518-RW-081","537","RES","320-45882-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"10.9","ng/L",,"0.549","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.3","10.00","1.72",""
"NAWC-120518-RW-081","537","RES","320-45882-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"4.68","ng/L",,"0.687","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.3","10.00","1.72",""
"NAWC-120518-RW-081","537","RES","320-45882-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.64","ng/L",,"1.12","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.3","10.00","2.57",""
"NAWC-120518-RW-081","537","RES","320-45882-7","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"1.64","ng/L","J","0.403","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.3","10.00","0.858",""
"NAWC-120518-RW-081","537","RES","320-45882-7","TALSAC","STL00993","13C2
PFHxA","74.5","ng/L",,"-99","DL",,"SURR","87",,"-99","LOQ","YES","85.8",,"291.3","10.00","0",,""
"NAWC-120518-RW-081","537","RES","320-45882-7","TALSAC","STL00996","13C2
PFDA","77.5","ng/L",,"-99","DL",,"SURR","90",,"-99","LOQ","YES","85.8",,"291.3","10.00","0",,""
"NAWC-120518-FRB-081","537","RES","320-45882-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"1.72","ng/L","U","0.816","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.1","10.00","1.72",""
"NAWC-120518-FRB-081","537","RES","320-45882-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"5.15","ng/L","U M","2.32","DL",,"TRG",,"","6.01","LOQ","YES",-99,"291.1","10.00","5.15",""
"NAWC-120518-FRB-081","537","RES","320-45882-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"1.72","ng/L","U","0.550","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.1","10.00","1.72",""
"NAWC-120518-FRB-081","537","RES","320-45882-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"1.72","ng/L","U","0.687","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.1","10.00","1.72",""
"NAWC-120518-FRB-081","537","RES","320-45882-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"2.58","ng/L","U","1.12","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.1","10.00","2.58",""
"NAWC-120518-FRB-081","537","RES","320-45882-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"0.859","ng/L","U","0.404","DL",,"TRG",,"","4.29","LOQ","YES",-99,"291.1","10.00","0.859",""
"NAWC-120518-FRB-081","537","RES","320-45882-8","TALSAC","STL00993","13C2
PFHxA","89.1","ng/L",,"-99","DL",,"SURR","104",,"-99","LOQ","YES","85.9",,"291.1","10.00","0",,""
"NAWC-120518-FRB-081","537","RES","320-45882-8","TALSAC","STL00996","13C2
PFDA","78.6","ng/L",,"-99","DL",,"SURR","92",,"-99","LOQ","YES","85.9",,"291.1","10.00","0",,""
"NAWC-120518-RW-082","537","RES","320-45882-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"43.7","ng/L",,"0.860","DL",,"TRG",,"","4.52","LOQ","YES",-99,"276.3","10.00","1.81",""
"NAWC-120518-RW-082","537","RES","320-45882-9","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"23.8","ng/L","M","2.44","DL",,"TRG",,"","6.33","LOQ","YES",-99,"276.3","10.00","5.43",""
"NAWC-120518-RW-082","537","RES","320-45882-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"5.21","ng/L",,"0.579","DL",,"TRG",,"","4.52","LOQ","YES",-99,"276.3","10.00","1.81",""
"NAWC-120518-RW-082","537","RES","320-45882-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"3.69","ng/L","J","0.724","DL",,"TRG",,"","4.52","LOQ","YES",-99,"276.3","10.00","1.81",""
"NAWC-120518-RW-082","537","RES","320-45882-9","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"7.73","ng/L",,"1.18","DL",,"TRG",,"","4.52","LOQ","YES",-99,"276.3","10.00","2.71",""
"NAWC-120518-RW-082","537","RES","320-45882-9","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"8.82","ng/L",,"0.425","DL",,"TRG",,"","4.52","LOQ","YES",-99,"276.3","10.00","0.905",""
"NAWC-120518-RW-082","537","RES","320-45882-9","TALSAC","STL00993","13C2
PFHxA","87.2","ng/L",,"-99","DL",,"SURR","96",,"-99","LOQ","YES","90.5",,"276.3","10.00","0",,""
"NAWC-120518-RW-082","537","RES","320-45882-9","TALSAC","STL00996","13C2
PFDA","84.0","ng/L",,"-99","DL",,"SURR","93",,"-99","LOQ","YES","90.5",,"276.3","10.00","0",,""
"LCS 320-264464/2-A","537","RES","LCS 320-264464/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"82.21","ng/L",,"0.950","DL",,"SPK","89",,"5.00","LOQ","YES","92.8",,"250","10.00","2.00",""
"LCS 320-264464/2-A","537","RES","LCS 320-264464/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"93.64","ng/L",,"2.70","DL",,"SPK","94",,"7.00","LOQ","YES","100",,"250","10.00","6.00",""
"LCS 320-264464/2-A","537","RES","LCS 320-264464/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"87.50","ng/L",,"0.640","DL",,"SPK","96",,"5.00","LOQ","YES","91.0",,"250","10.00","2.00",""
"LCS 320-264464/2-A","537","RES","LCS 320-264464/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)", "89.14", "ng/L", "", "0.800", "DL", "", "SPK", "101", "", "5.00", "LOQ", "YES", "88.4", "", "250", "10.00", "2.00", ""
"LCS 320-264464/2-A", "537", "RES", "LCS 320-264464/2-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "91.44", "ng/L", "", "1.30", "DL", "", "SPK", "91", "", "5.00", "LOQ", "YES", "100", "", "250", "10.00", "3.00", ""
"LCS 320-264464/2-A", "537", "RES", "LCS 320-264464/2-A", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "88.85", "ng/L", "", "0.470", "DL", "", "SPK", "89", "", "5.00", "LOQ", "YES", "100", "", "250", "10.00", "1.00", ""
"LCS 320-264464/2-A", "537", "RES", "LCS 320-264464/2-A", "TALSAC", "STL00993", "13C2
PFHxA", "100.6", "ng/L", "", "-99", "DL", "", "SURR", "101", "", "-99", "LOQ", "YES", "100", "", "250", "10.00", "0", ""
"LCS 320-264464/2-A", "537", "RES", "LCS 320-264464/2-A", "TALSAC", "STL00996", "13C2
PFDA", "91.45", "ng/L", "", "-99", "DL", "", "SURR", "91", "", "-99", "LOQ", "YES", "100", "", "250", "10.00", "0", ""
"LCSD 320-264464/3-A", "537", "RES", "LCSD 320-264464/3-A", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic
acid (PFOS)", "86.94", "ng/L", "", "0.950", "DL", "", "SPK", "94", "6", "5.00", "LOQ", "YES", "92.8", "LCS 320-264464/2-
A", "250", "10.00", "2.00", ""
"LCSD 320-264464/3-A", "537", "RES", "LCSD 320-264464/3-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "90.24", "ng/L", "", "2.70", "DL", "", "SPK", "90", "4", "7.00", "LOQ", "YES", "100", "LCS 320-264464/2-
A", "250", "10.00", "6.00", ""
"LCSD 320-264464/3-A", "537", "RES", "LCSD 320-264464/3-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic
acid (PFHxS)", "93.58", "ng/L", "", "0.640", "DL", "", "SPK", "103", "7", "5.00", "LOQ", "YES", "91.0", "LCS 320-264464/2-
A", "250", "10.00", "2.00", ""
"LCSD 320-264464/3-A", "537", "RES", "LCSD 320-264464/3-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "88.28", "ng/L", "", "0.800", "DL", "", "SPK", "100", "1", "5.00", "LOQ", "YES", "88.4", "LCS 320-264464/2-
A", "250", "10.00", "2.00", ""
"LCSD 320-264464/3-A", "537", "RES", "LCSD 320-264464/3-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "95.06", "ng/L", "", "1.30", "DL", "", "SPK", "95", "4", "5.00", "LOQ", "YES", "100", "LCS 320-264464/2-
A", "250", "10.00", "3.00", ""
"LCSD 320-264464/3-A", "537", "RES", "LCSD 320-264464/3-A", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "85.73", "ng/L", "", "0.470", "DL", "", "SPK", "86", "4", "5.00", "LOQ", "YES", "100", "LCS 320-264464/2-
A", "250", "10.00", "1.00", ""
"LCSD 320-264464/3-A", "537", "RES", "LCSD 320-264464/3-A", "TALSAC", "STL00993", "13C2
PFHxA", "89.45", "ng/L", "", "-99", "DL", "", "SURR", "89", "", "-99", "LOQ", "YES", "100", "LCS 320-264464/2-
A", "250", "10.00", "0", ""
"LCSD 320-264464/3-A", "537", "RES", "LCSD 320-264464/3-A", "TALSAC", "STL00996", "13C2
PFDA", "91.57", "ng/L", "", "-99", "DL", "", "SURR", "92", "", "-99", "LOQ", "YES", "100", "LCS 320-264464/2-
A", "250", "10.00", "0", ""
"MB 320-264464/1-A", "537", "RES", "MB 320-264464/1-A", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)", "2.00", "ng/L", "U", "0.950", "DL", "", "TRG", "", "", "5.00", "LOQ", "YES", "-99", "", "250", "10.00", "2.00", ""
"MB 320-264464/1-A", "537", "RES", "MB 320-264464/1-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "6.00", "ng/L", "U M", "2.70", "DL", "", "TRG", "", "", "7.00", "LOQ", "YES", "-99", "", "250", "10.00", "6.00", ""
"MB 320-264464/1-A", "537", "RES", "MB 320-264464/1-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)", "2.00", "ng/L", "U", "0.640", "DL", "", "TRG", "", "", "5.00", "LOQ", "YES", "-99", "", "250", "10.00", "2.00", ""
"MB 320-264464/1-A", "537", "RES", "MB 320-264464/1-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "2.00", "ng/L", "U", "0.800", "DL", "", "TRG", "", "", "5.00", "LOQ", "YES", "-99", "", "250", "10.00", "2.00", ""
"MB 320-264464/1-A", "537", "RES", "MB 320-264464/1-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "3.00", "ng/L", "U M", "1.30", "DL", "", "TRG", "", "", "5.00", "LOQ", "YES", "-99", "", "250", "10.00", "3.00", ""
"MB 320-264464/1-A", "537", "RES", "MB 320-264464/1-A", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "1.00", "ng/L", "U", "0.470", "DL", "", "TRG", "", "", "5.00", "LOQ", "YES", "-99", "", "250", "10.00", "1.00", ""
"MB 320-264464/1-A", "537", "RES", "MB 320-264464/1-A", "TALSAC", "STL00993", "13C2
PFHxA", "76.02", "ng/L", "", "-99", "DL", "", "SURR", "76", "", "-99", "LOQ", "YES", "100", "", "250", "10.00", "0", ""
"MB 320-264464/1-A", "537", "RES", "MB 320-264464/1-A", "TALSAC", "STL00996", "13C2
PFDA", "73.56", "ng/L", "", "-99", "DL", "", "SURR", "74", "", "-99", "LOQ", "YES", "100", "", "250", "10.00", "0", ""
"Unknown", "Unknown", "WGNA-120518-RW-0263", "12/05/2018 07:40", "AQ", "320-45882-
1", "NM", "", "4.70", "537", "METHOD", "RES", "12/11/2018 10:06", "12/13/2018
00:55", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-264464", "320-264464", "NA", "320-
264881", "320-45882-1", "12/06/2018 15:34", "12/09/2018 12:25", ""
"Unknown", "Unknown", "NAWC-120518-FRB-082", "12/05/2018 10:35", "AQ", "320-45882-

10","FB",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
02:17","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264883","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","WGNA-120518-RW-0413","12/05/2018 13:40","AQ","320-45882-
11","NM",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
02:24","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264883","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","WGNA-120518-FRB-0413","12/05/2018 13:35","AQ","320-45882-
12","FB",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
02:32","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264883","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","WGNA-120518-DUP-53","12/05/2018 07:00","AQ","320-45882-
13","FD",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
02:39","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264883","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","WGNA-120518-FRB-0263","12/05/2018 07:35","AQ","320-45882-
2","FB",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
01:02","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264881","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","NAWC-120518-RW-154","12/05/2018 08:10","AQ","320-45882-
3","NM",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
01:09","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264881","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","NAWC-120518-FRB-154","12/05/2018 08:05","AQ","320-45882-
4","FB",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
01:17","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264881","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","WGNA-120518-RW-0533","12/05/2018 08:40","AQ","320-45882-
5","NM",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
01:24","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264881","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","WGNA-120518-FRB-0533","12/05/2018 08:35","AQ","320-45882-
6","FB",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
01:47","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264883","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","NAWC-120518-RW-081","12/05/2018 10:10","AQ","320-45882-
7","NM",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
01:54","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264883","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","NAWC-120518-FRB-081","12/05/2018 10:05","AQ","320-45882-
8","FB",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
02:02","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264883","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","NAWC-120518-RW-082","12/05/2018 10:40","AQ","320-45882-
9","NM",,"4.70","537","METHOD","RES","12/11/2018 10:06","12/13/2018
02:09","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264883","320-45882-1","12/06/2018 15:34","12/09/2018 12:25",,"
"Unknown","Unknown","LCS 320-264464/2-A",,"AQ","LCS 320-264464/2-
A","LCS",,"-99","537","METHOD","RES","12/11/2018 10:06","12/13/2018
00:25","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-
264881","320-45882-1","12/11/2018 10:06","12/09/2018 12:25",,"
"Unknown","Unknown","LCSD 320-264464/3-A",,"AQ","LCSD 320-264464/3-
A","LCSD",,"-99","537","METHOD","RES","12/11/2018 10:06","12/13/2018
00:32","TALSAC","COA","WET","NA","1","NA","NA",,"100","320-264464","320-264464","NA","320-

264881","320-45882-1","12/11/2018 10:06","12/09/2018 12:25",""
"Unknown","Unknown","MB 320-264464/1-A","","AQ","MB 320-264464/1-
A","MB","","-99","537","METHOD","RES","12/11/2018 10:06","12/13/2018
00:17","TALSAC","COA","WET","NA","1","NA","NA","","100","320-264464","320-264464","NA","320-
264881","320-45882-1","12/11/2018 10:06","12/09/2018 12:25",""



TO: A. FREBOWITZ **DATE:** JANUARY 2, 2018
FROM: TERRI L. SOLOMON **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-45882-1

SAMPLES: 6/Field Reagent Blank (FRB)
NAWC-120518-FRB-081 NAWC-120518-FRB-082
NAWC-120518-FRB-154 WGNA-120518-FRB-0263
WGNA-120518-FRB-0413 WGNA-120518-FRB-0533

7/Drinking Water
NAWC-120518-RW-081 NAWC-120518-RW-082
NAWC-120518-RW-154 WGNA-120518-DUP-53
WGNA-120518-RW-0263 WGNA-120518-RW-0413
WGNA-120518-RW-0533

Overview

The sample set for NAS JRB Willow Grove, SDG 320-45882-1, consisted of seven (7) drinking water samples and six (6) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). One (1) field duplicate pair, WGNA-120518-RW-0263 / WGNA-120518-DUP-53 was included in this SDG.

The samples were collected by Tetra Tech on December 5, 2018 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, mass calibration, mass spectral acquisition rate, instrument sensitivity check, peak asymmetry factor, initial/continuing calibrations, ion transitions, laboratory method/FRB results, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, injected internal standard areas and recoveries, field duplicate results, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major

No issues.

Minor

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

Notes

It was noted that a preservative was indicated on the chain of custody. However, Trizma was not listed as the preservative.

TO: A. FREBOWITZ
SDG: 320-45882-1

PAGE 2

It was noted by the laboratory that the container label did not match the chain of custody for sample NAWC-120518-FRB-154. The container date sample date was 11/01/2018. The chain of custody date was 12/05/2018. No action was taken regarding this labeling anomaly.

Samples with detections and their associated FRBs are summarized below. No positive results were detected in the FRB samples.

<u>Sample</u>	<u>Associated FRB</u>
NAWC-120518-RW-081	NAWC-120518-FRB-081
NAWC-120518-RW-082	NAWC-120518-FRB-082
NAWC-120518-RW-154	NAWC-120518-FRB-154
WGNA-120518-DUP-53	WGNA-120518-FRB-0263
WGNA-120518-RW-0263	WGNA-120518-FRB-0263
WGNA-120518-RW-0413	WGNA-120518-FRB-0413
WGNA-120518-RW-0533	WGNA-120518-FRB-0533

Non-detected results were reported to the Limit of Detection (LOD).


The buffering agent Trizma was added to all drinking water samples.

Executive Summary

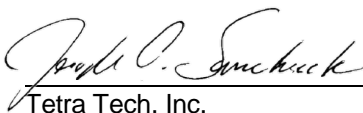
Laboratory Performance: No issues.

Other Factors Affecting Data Quality: Results below the RL were estimated.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009), US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013) as applicable. The text of this report has been formulated to address only those areas affecting data quality.



Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator



Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

TO: A. FREBOWITZ
SDG: 320-45882-1

PAGE 3

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

Appendix A

Qualified Analytical Results

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors $>40\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $<30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04 SDG: 320-45882-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-120518-FRB-081			NAWC-120518-FRB-082			NAWC-120518-FRB-154			NAWC-120518-RW-081		
	LAB_ID	320-45882-8			320-45882-10			320-45882-4			320-45882-7		
	SAMP_DATE	12/5/2018			12/5/2018			12/5/2018			12/5/2018		
	QC_TYPE	FB			FB			FB			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	5.15	U		5.23	U		5.21	U		14.4			
PERFLUOROBUTANESULFONIC ACID (PFBS)	1.72	U		1.74	U		1.74	U		4.68			
PERFLUOROHEPTANOIC ACID (PFHPA)	2.58	U		2.62	U		2.61	U		4.64			
PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.72	U		1.74	U		1.74	U		10.9			
PERFLUORONONANOIC ACID (PFNA)	0.859	U		0.872	U		0.869	U		1.64	J	P	
PERFLUOROOCTANESULFONIC ACID (PFOS)	1.72	U		1.74	U		1.74	U		18.8			

PROJ_NO: 08005-WE04 SDG: 320-45882-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-120518-RW-082			NAWC-120518-RW-154			WGNA-120518-DUP-53			WGNA-120518-FRB-0263		
	LAB_ID	320-45882-9			320-45882-3			320-45882-13			320-45882-2		
	SAMP_DATE	12/5/2018			12/5/2018			12/5/2018			12/5/2018		
	QC_TYPE	NM			NM			FD			FB		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF							WGNA-120518-RW-0263					
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	23.8			23.6			14.4			5.28	U		
PERFLUOROBUTANESULFONIC ACID (PFBS)	3.69	J	P	9.03			15			1.76	U		
PERFLUOROHEPTANOIC ACID (PFHPA)	7.73			8			3.4	J	P	2.64	U		
PERFLUOROHEXANESULFONIC ACID (PFHXS)	5.21			4.63	J	P	7.41			1.76	U		
PERFLUORONONANOIC ACID (PFNA)	8.82			1.86	J	P	0.923	J	P	0.881	U		
PERFLUOROOCTANESULFONIC ACID (PFOS)	43.7			16			13.4			1.76	U		

PROJ_NO: 08005-WE04 SDG: 320-45882-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-120518-FRB-0413			WGNA-120518-FRB-0533			WGNA-120518-RW-0263			WGNA-120518-RW-0413		
	LAB_ID	320-45882-12			320-45882-6			320-45882-1			320-45882-11		
	SAMP_DATE	12/5/2018			12/5/2018			12/5/2018			12/5/2018		
	QC_TYPE	FB			FB			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	5.28	U		5.43	U		14.2			20.1			
PERFLUOROBUTANESULFONIC ACID (PFBS)	1.76	U		1.81	U		14.7			7.78			
PERFLUOROHEPTANOIC ACID (PFHPA)	2.64	U		2.71	U		3.19	J	P	5.9			
PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.76	U		1.81	U		6.95			6.56			
PERFLUORONONANOIC ACID (PFNA)	0.881	U		0.904	U		0.817	J	P	2.82	J	P	
PERFLUOROOCTANESULFONIC ACID (PFOS)	1.76	U		1.81	U		14.1			22			

PROJ_NO: 08005-WE04 SDG: 320-45882-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-120518-RW-0533		
	LAB_ID	320-45882-5		
	SAMP_DATE	12/5/2018		
	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	23.3			
PERFLUOROBUTANESULFONIC ACID (PFBS)	9.08			
PERFLUOROHEPTANOIC ACID (PFHPA)	5			
PERFLUOROHEXANESULFONIC ACID (PFHXS)	10.1			
PERFLUORONONANOIC ACID (PFNA)	2.53	J	P	
PERFLUOROOCTANESULFONIC ACID (PFOS)	21.1			

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-RW-0263 Lab Sample ID: 320-45882-1
 Matrix: Water Lab File ID: 2018.12.12_537A_049.d
 Analysis Method: 537 Date Collected: 12/05/2018 07:40
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 251.9(mL) Date Analyzed: 12/13/2018 00:55
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14.1		4.96	1.98	0.943
335-67-1	Perfluorooctanoic acid (PFOA)	14.2	M	6.95	5.95	2.68
375-95-1	Perfluorononanoic acid (PFNA)	0.817	J	4.96	0.992	0.466
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.95		4.96	1.98	0.635
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.19	J	4.96	2.98	1.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	14.7		4.96	1.98	0.794

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	82		70-130

Maria L. Selman
01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-FRB-0263 Lab Sample ID: 320-45882-2
 Matrix: Water Lab File ID: 2018.12.12_537A_050.d
 Analysis Method: 537 Date Collected: 12/05/2018 07:35
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 283.9(mL) Date Analyzed: 12/13/2018 01:02
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.76	U	4.40	1.76	0.837
335-67-1	Perfluorooctanoic acid (PFOA)	5.28	U M	6.16	5.28	2.38
375-95-1	Perfluorononanoic acid (PFNA)	0.881	U	4.40	0.881	0.414
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.76	U	4.40	1.76	0.564
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.64	U	4.40	2.64	1.14
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.76	U	4.40	1.76	0.704

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	98		70-130

Wesley L. Salzman

01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-RW-154 Lab Sample ID: 320-45882-3
 Matrix: Water Lab File ID: 2018.12.12_537A_051.d
 Analysis Method: 537 Date Collected: 12/05/2018 08:10
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 267.7(mL) Date Analyzed: 12/13/2018 01:09
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16.0		4.67	1.87	0.887
335-67-1	Perfluorooctanoic acid (PFOA)	23.6	M	6.54	5.60	2.52
375-95-1	Perfluorononanoic acid (PFNA)	1.86	J	4.67	0.934	0.439
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	4.63	J	4.67	1.87	0.598
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.00		4.67	2.80	1.21
375-73-5	Perfluorobutanesulfonic acid (PFBS)	9.03		4.67	1.87	0.747

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	99		70-130

Mari L. Selman
01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-FRB-154 Lab Sample ID: 320-45882-4
 Matrix: Water Lab File ID: 2018.12.12_537A_052.d
 Analysis Method: 537 Date Collected: 12/05/2018 08:05
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 287.7(mL) Date Analyzed: 12/13/2018 01:17
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.74	U	4.34	1.74	0.826
335-67-1	Perfluorooctanoic acid (PFOA)	5.21	U M	6.08	5.21	2.35
375-95-1	Perfluorononanoic acid (PFNA)	0.869	U	4.34	0.869	0.408
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.74	U	4.34	1.74	0.556
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.61	U	4.34	2.61	1.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.74	U	4.34	1.74	0.695

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	90		70-130

Wesley L. Selman

01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-RW-0533 Lab Sample ID: 320-45882-5
 Matrix: Water Lab File ID: 2018.12.12_537A_053.d
 Analysis Method: 537 Date Collected: 12/05/2018 08:40
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 298.8 (mL) Date Analyzed: 12/13/2018 01:24
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21.1		4.18	1.67	0.795
335-67-1	Perfluorooctanoic acid (PFOA)	23.3	M	5.86	5.02	2.26
375-95-1	Perfluorononanoic acid (PFNA)	2.53	J	4.18	0.837	0.393
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10.1		4.18	1.67	0.535
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.00		4.18	2.51	1.09
375-73-5	Perfluorobutanesulfonic acid (PFBS)	9.08		4.18	1.67	0.669

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	86		70-130

Maria L. Salmeron
01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-FRB-0533 Lab Sample ID: 320-45882-6
 Matrix: Water Lab File ID: 2018.12.12_537A_056.d
 Analysis Method: 537 Date Collected: 12/05/2018 08:35
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 276.4 (mL) Date Analyzed: 12/13/2018 01:47
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.81	U	4.52	1.81	0.859
335-67-1	Perfluorooctanoic acid (PFOA)	5.43	U M	6.33	5.43	2.44
375-95-1	Perfluorononanoic acid (PFNA)	0.904	U	4.52	0.904	0.425
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.81	U	4.52	1.81	0.579
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.71	U	4.52	2.71	1.18
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.81	U	4.52	1.81	0.724

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	98		70-130

Steve L. Selman

01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-RW-081 Lab Sample ID: 320-45882-7
 Matrix: Water Lab File ID: 2018.12.12_537A_057.d
 Analysis Method: 537 Date Collected: 12/05/2018 10:10
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 291.3(mL) Date Analyzed: 12/13/2018 01:54
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18.8		4.29	1.72	0.815
335-67-1	Perfluorooctanoic acid (PFOA)	14.4	M	6.01	5.15	2.32
375-95-1	Perfluorononanoic acid (PFNA)	1.64	J	4.29	0.858	0.403
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10.9		4.29	1.72	0.549
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.64		4.29	2.57	1.12
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.68		4.29	1.72	0.687

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	90		70-130

Steve L. Selman

01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-FRB-081 Lab Sample ID: 320-45882-8
 Matrix: Water Lab File ID: 2018.12.12_537A_058.d
 Analysis Method: 537 Date Collected: 12/05/2018 10:05
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 291.1(mL) Date Analyzed: 12/13/2018 02:02
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.72	U	4.29	1.72	0.816
335-67-1	Perfluorooctanoic acid (PFOA)	5.15	U M	6.01	5.15	2.32
375-95-1	Perfluorononanoic acid (PFNA)	0.859	U	4.29	0.859	0.404
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.72	U	4.29	1.72	0.550
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.58	U	4.29	2.58	1.12
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.72	U	4.29	1.72	0.687

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	104		70-130
STL00996	13C2 PFDA	92		70-130

Wesley L. Selman
01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-RW-082 Lab Sample ID: 320-45882-9
 Matrix: Water Lab File ID: 2018.12.12_537A_059.d
 Analysis Method: 537 Date Collected: 12/05/2018 10:40
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 276.3(mL) Date Analyzed: 12/13/2018 02:09
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	43.7		4.52	1.81	0.860
335-67-1	Perfluorooctanoic acid (PFOA)	23.8	M	6.33	5.43	2.44
375-95-1	Perfluorononanoic acid (PFNA)	8.82		4.52	0.905	0.425
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	5.21		4.52	1.81	0.579
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.73		4.52	2.71	1.18
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.69	J	4.52	1.81	0.724

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	93		70-130

Ali L. Selman

01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-FRB-082 Lab Sample ID: 320-45882-10
 Matrix: Water Lab File ID: 2018.12.12_537A_060.d
 Analysis Method: 537 Date Collected: 12/05/2018 10:35
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 286.7(mL) Date Analyzed: 12/13/2018 02:17
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.74	U	4.36	1.74	0.828
335-67-1	Perfluorooctanoic acid (PFOA)	5.23	U M	6.10	5.23	2.35
375-95-1	Perfluorononanoic acid (PFNA)	0.872	U	4.36	0.872	0.410
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.74	U	4.36	1.74	0.558
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.62	U	4.36	2.62	1.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.74	U	4.36	1.74	0.698

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	93		70-130

Wesley L. Selman

01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-RW-0413 Lab Sample ID: 320-45882-11
 Matrix: Water Lab File ID: 2018.12.12_537A_061.d
 Analysis Method: 537 Date Collected: 12/05/2018 13:40
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 293.8 (mL) Date Analyzed: 12/13/2018 02:24
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	22.0		4.25	1.70	0.808
335-67-1	Perfluorooctanoic acid (PFOA)	20.1	M	5.96	5.11	2.30
375-95-1	Perfluorononanoic acid (PFNA)	2.82	J	4.25	0.851	0.400
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.56		4.25	1.70	0.545
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.90		4.25	2.55	1.11
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.78		4.25	1.70	0.681

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	92		70-130

Wesley L. Salzman
01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-FRB-0413 Lab Sample ID: 320-45882-12
 Matrix: Water Lab File ID: 2018.12.12_537A_062.d
 Analysis Method: 537 Date Collected: 12/05/2018 13:35
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 283.9(mL) Date Analyzed: 12/13/2018 02:32
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.76	U	4.40	1.76	0.837
335-67-1	Perfluorooctanoic acid (PFOA)	5.28	U M	6.16	5.28	2.38
375-95-1	Perfluorononanoic acid (PFNA)	0.881	U	4.40	0.881	0.414
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.76	U	4.40	1.76	0.564
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.64	U M	4.40	2.64	1.14
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.76	U	4.40	1.76	0.704

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	83		70-130

Wesley L. Selman

01/02/2019

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-DUP-53 Lab Sample ID: 320-45882-13
 Matrix: Water Lab File ID: 2018.12.12_537A_063.d
 Analysis Method: 537 Date Collected: 12/05/2018 07:00
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 257.4 (mL) Date Analyzed: 12/13/2018 02:39
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13.4		4.86	1.94	0.923
335-67-1	Perfluorooctanoic acid (PFOA)	14.4	M	6.80	5.83	2.62
375-95-1	Perfluorononanoic acid (PFNA)	0.923	J	4.86	0.971	0.456
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.41		4.86	1.94	0.622
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.40	J	4.86	2.91	1.26
375-73-5	Perfluorobutanesulfonic acid (PFBS)	15.0		4.86	1.94	0.777

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	84		70-130

Steve L. Selman

01/02/2019

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-RW-0263 Lab Sample ID: 320-45882-1
 Matrix: Water Lab File ID: 2018.12.12_537A_049.d
 Analysis Method: 537 Date Collected: 12/05/2018 07:40
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 251.9(mL) Date Analyzed: 12/13/2018 00:55
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14.1		4.96	1.98	0.943
335-67-1	Perfluorooctanoic acid (PFOA)	14.2	M	6.95	5.95	2.68
375-95-1	Perfluorononanoic acid (PFNA)	0.817	J	4.96	0.992	0.466
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.95		4.96	1.98	0.635
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.19	J	4.96	2.98	1.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	14.7		4.96	1.98	0.794

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	82		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-FRB-0263 Lab Sample ID: 320-45882-2
 Matrix: Water Lab File ID: 2018.12.12_537A_050.d
 Analysis Method: 537 Date Collected: 12/05/2018 07:35
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 283.9(mL) Date Analyzed: 12/13/2018 01:02
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.76	U	4.40	1.76	0.837
335-67-1	Perfluorooctanoic acid (PFOA)	5.28	U M	6.16	5.28	2.38
375-95-1	Perfluorononanoic acid (PFNA)	0.881	U	4.40	0.881	0.414
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.76	U	4.40	1.76	0.564
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.64	U	4.40	2.64	1.14
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.76	U	4.40	1.76	0.704

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	98		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-RW-154 Lab Sample ID: 320-45882-3
 Matrix: Water Lab File ID: 2018.12.12_537A_051.d
 Analysis Method: 537 Date Collected: 12/05/2018 08:10
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 267.7(mL) Date Analyzed: 12/13/2018 01:09
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16.0		4.67	1.87	0.887
335-67-1	Perfluorooctanoic acid (PFOA)	23.6	M	6.54	5.60	2.52
375-95-1	Perfluorononanoic acid (PFNA)	1.86	J	4.67	0.934	0.439
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	4.63	J	4.67	1.87	0.598
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.00		4.67	2.80	1.21
375-73-5	Perfluorobutanesulfonic acid (PFBS)	9.03		4.67	1.87	0.747

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-FRB-154 Lab Sample ID: 320-45882-4
 Matrix: Water Lab File ID: 2018.12.12_537A_052.d
 Analysis Method: 537 Date Collected: 12/05/2018 08:05
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 287.7(mL) Date Analyzed: 12/13/2018 01:17
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.74	U	4.34	1.74	0.826
335-67-1	Perfluorooctanoic acid (PFOA)	5.21	U M	6.08	5.21	2.35
375-95-1	Perfluorononanoic acid (PFNA)	0.869	U	4.34	0.869	0.408
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.74	U	4.34	1.74	0.556
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.61	U	4.34	2.61	1.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.74	U	4.34	1.74	0.695

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	90		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-RW-0533 Lab Sample ID: 320-45882-5
 Matrix: Water Lab File ID: 2018.12.12_537A_053.d
 Analysis Method: 537 Date Collected: 12/05/2018 08:40
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 298.8 (mL) Date Analyzed: 12/13/2018 01:24
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21.1		4.18	1.67	0.795
335-67-1	Perfluorooctanoic acid (PFOA)	23.3	M	5.86	5.02	2.26
375-95-1	Perfluorononanoic acid (PFNA)	2.53	J	4.18	0.837	0.393
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10.1		4.18	1.67	0.535
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.00		4.18	2.51	1.09
375-73-5	Perfluorobutanesulfonic acid (PFBS)	9.08		4.18	1.67	0.669

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	86		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-FRB-0533 Lab Sample ID: 320-45882-6
 Matrix: Water Lab File ID: 2018.12.12_537A_056.d
 Analysis Method: 537 Date Collected: 12/05/2018 08:35
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 276.4 (mL) Date Analyzed: 12/13/2018 01:47
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.81	U	4.52	1.81	0.859
335-67-1	Perfluorooctanoic acid (PFOA)	5.43	U M	6.33	5.43	2.44
375-95-1	Perfluorononanoic acid (PFNA)	0.904	U	4.52	0.904	0.425
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.81	U	4.52	1.81	0.579
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.71	U	4.52	2.71	1.18
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.81	U	4.52	1.81	0.724

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	98		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-RW-081 Lab Sample ID: 320-45882-7
 Matrix: Water Lab File ID: 2018.12.12_537A_057.d
 Analysis Method: 537 Date Collected: 12/05/2018 10:10
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 291.3(mL) Date Analyzed: 12/13/2018 01:54
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18.8		4.29	1.72	0.815
335-67-1	Perfluorooctanoic acid (PFOA)	14.4	M	6.01	5.15	2.32
375-95-1	Perfluorononanoic acid (PFNA)	1.64	J	4.29	0.858	0.403
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	10.9		4.29	1.72	0.549
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.64		4.29	2.57	1.12
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.68		4.29	1.72	0.687

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	90		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-FRB-081 Lab Sample ID: 320-45882-8
 Matrix: Water Lab File ID: 2018.12.12_537A_058.d
 Analysis Method: 537 Date Collected: 12/05/2018 10:05
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 291.1(mL) Date Analyzed: 12/13/2018 02:02
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.72	U	4.29	1.72	0.816
335-67-1	Perfluorooctanoic acid (PFOA)	5.15	U M	6.01	5.15	2.32
375-95-1	Perfluorononanoic acid (PFNA)	0.859	U	4.29	0.859	0.404
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.72	U	4.29	1.72	0.550
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.58	U	4.29	2.58	1.12
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.72	U	4.29	1.72	0.687

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	104		70-130
STL00996	13C2 PFDA	92		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-RW-082 Lab Sample ID: 320-45882-9
 Matrix: Water Lab File ID: 2018.12.12_537A_059.d
 Analysis Method: 537 Date Collected: 12/05/2018 10:40
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 276.3(mL) Date Analyzed: 12/13/2018 02:09
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	43.7		4.52	1.81	0.860
335-67-1	Perfluorooctanoic acid (PFOA)	23.8	M	6.33	5.43	2.44
375-95-1	Perfluorononanoic acid (PFNA)	8.82		4.52	0.905	0.425
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	5.21		4.52	1.81	0.579
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.73		4.52	2.71	1.18
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.69	J	4.52	1.81	0.724

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	93		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: NAWC-120518-FRB-082 Lab Sample ID: 320-45882-10
 Matrix: Water Lab File ID: 2018.12.12_537A_060.d
 Analysis Method: 537 Date Collected: 12/05/2018 10:35
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 286.7(mL) Date Analyzed: 12/13/2018 02:17
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.74	U	4.36	1.74	0.828
335-67-1	Perfluorooctanoic acid (PFOA)	5.23	U M	6.10	5.23	2.35
375-95-1	Perfluorononanoic acid (PFNA)	0.872	U	4.36	0.872	0.410
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.74	U	4.36	1.74	0.558
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.62	U	4.36	2.62	1.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.74	U	4.36	1.74	0.698

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	93		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-RW-0413 Lab Sample ID: 320-45882-11
 Matrix: Water Lab File ID: 2018.12.12_537A_061.d
 Analysis Method: 537 Date Collected: 12/05/2018 13:40
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 293.8 (mL) Date Analyzed: 12/13/2018 02:24
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	22.0		4.25	1.70	0.808
335-67-1	Perfluorooctanoic acid (PFOA)	20.1	M	5.96	5.11	2.30
375-95-1	Perfluorononanoic acid (PFNA)	2.82	J	4.25	0.851	0.400
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.56		4.25	1.70	0.545
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.90		4.25	2.55	1.11
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.78		4.25	1.70	0.681

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	92		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-FRB-0413 Lab Sample ID: 320-45882-12
 Matrix: Water Lab File ID: 2018.12.12_537A_062.d
 Analysis Method: 537 Date Collected: 12/05/2018 13:35
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 283.9(mL) Date Analyzed: 12/13/2018 02:32
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.76	U	4.40	1.76	0.837
335-67-1	Perfluorooctanoic acid (PFOA)	5.28	U M	6.16	5.28	2.38
375-95-1	Perfluorononanoic acid (PFNA)	0.881	U	4.40	0.881	0.414
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.76	U	4.40	1.76	0.564
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.64	U M	4.40	2.64	1.14
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.76	U	4.40	1.76	0.704

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	89		70-130
STL00996	13C2 PFDA	83		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: WGNA-120518-DUP-53 Lab Sample ID: 320-45882-13
 Matrix: Water Lab File ID: 2018.12.12_537A_063.d
 Analysis Method: 537 Date Collected: 12/05/2018 07:00
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 257.4 (mL) Date Analyzed: 12/13/2018 02:39
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264883 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13.4		4.86	1.94	0.923
335-67-1	Perfluorooctanoic acid (PFOA)	14.4	M	6.80	5.83	2.62
375-95-1	Perfluorononanoic acid (PFNA)	0.923	J	4.86	0.971	0.456
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.41		4.86	1.94	0.622
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.40	J	4.86	2.91	1.26
375-73-5	Perfluorobutanesulfonic acid (PFBS)	15.0		4.86	1.94	0.777

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	84		70-130

Appendix C

Support Documentation

ANALYTE	ORIGINAL	DUPLICATE		RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE	DUPLICATE	DIFFERENCE >2XRL
	WGNA-120518- RW-0263	DUP-53	CONC >2xRL				SAMPLE CONC >2xRL		
PENTADEC AFLUORO OCTANOIC ACID (PFOA)	14.2	14.4	6.95	1.40	FALSE	TRUE	TRUE	FALSE	
PERFLUOROBUTANESULFONIC ACID (PFBS)	14.7	15	4.96	2.02	FALSE	TRUE	TRUE	FALSE	
PERFLUOROHEPTANOIC ACID (PFHPA)	3.19	3.4	4.96	6.37	FALSE	FALSE	FALSE	FALSE	
PERFLUOROHEXANESULFONIC ACID (PFHXS)	6.95	7.41	4.96	6.41	FALSE	FALSE	FALSE	FALSE	
PERFLUORONONANOIC ACID (PFNA)	0.817	0.923	4.96	12.18	FALSE	FALSE	FALSE	FALSE	
PERFLUORO OCTANESULFONIC ACID (PFOS)	14.1	13.4	4.96	5.09	FALSE	TRUE	TRUE	FALSE	

TestAmerica Sacramento
 880 Riverside Parkway
 West Sacramento, CA 95605-1500
 phone 916.373.5600 fax 303.467.7248

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: Andy Frebowitz				Site Contact: Mary Kay Bond				Date: 12/5/2018				COC No:									
TetraTech		Tel/Fax: 610.382.2920				Lab Contact: Dave Alltucker				Carrier: FedEx				1 of 1 COCs									
234 Mall Boulevard Suite 260		Analysis Turnaround Time																					
King of Prussia, PA 19406		<input type="checkbox"/> CALENDAR DAYS				<input type="checkbox"/> WORKING DAYS																	
610-382-2924		TAT if different from Below 21																					
610-491-9688		<input checked="" type="checkbox"/> 2 weeks																					
Project Name: WE04		<input type="checkbox"/> 1 week																					
Site: WE04		<input type="checkbox"/> 2 days																					
P O # 1132358 (through EarthToxics)		<input type="checkbox"/> 1 day																					
						Filtered Sample (Y/N) Perform MS / MSD (Y / N) EPA 537 UCMR3																	
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix			# of Cont.	Sample Specific Notes:														
WGNA-120518-RW-0263		12/5/2018	07:40	G	DW			2															
WGNA-120518-FRB-0263		12/5/2018	07:35	G	DW			2	Field Reagent Blank														
NAWC-120518-RW-154		12/5/2018	08:10	G	DW			2															
NAWC-120518-FRB-154		12/5/2018	08:05	G	DW			2	Field Reagent Blank														
WGNA-120518-RW-0533		12/5/2018	08:40	G	DW			2															
WGNA-120518-FRB-0533		12/5/2018	08:35	G	DW			2	Field Reagent Blank														
NAWC-120518-RW-081		12/5/2018	10:10	G	DW			2															
NAWC-120518-FRB-081		12/5/2018	10:05	G	DW			2	Field Reagent Blank														
NAWC-120518-RW-082		12/5/2018	10:40	G	DW			2															
NAWC-120518-FRB-082		12/5/2018	10:35	G	DW			2	Field Reagent Blank														
WGNA-120518-RW-0413		12/5/2018	13:40	G	DW			2															
WGNA-120518-FRB-0413		12/5/2018	13:35	G	DW			2	Field Reagent Blank														
WGNA-120518-DUP-53		12/5/2018	07:00	G	DW	2	DUPLICATE																
						6																	
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.										Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)													
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown										<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months													
Fed Ex Tracking: 7738 9083 8504																							
+ Client label date is 11/01/18 @ 12/3/18																							
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Custody Seal No.:				Cooler Temp. (°C): Obs'd: 47 Corr'd: 47				Therm ID No.: AK-2											
Relinquished by: <i>[Signature]</i>				Company: Tetra Tech				Date/Time: 12/5/2018 16:00				Received by: <i>[Signature]</i>											
												Company: TR-SAC											
												Date/Time: 12/16/18 0850											

Page 382 of 383



Sample Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-45882-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-45882-1	WGNA-120518-RW-0263	Water	12/05/18 07:40	12/06/18 15:34
320-45882-2	WGNA-120518-FRB-0263	Water	12/05/18 07:35	12/06/18 15:34
320-45882-3	NAWC-120518-RW-154	Water	12/05/18 08:10	12/06/18 15:34
320-45882-4	NAWC-120518-FRB-154	Water	12/05/18 08:05	12/06/18 15:34
320-45882-5	WGNA-120518-RW-0533	Water	12/05/18 08:40	12/06/18 15:34
320-45882-6	WGNA-120518-FRB-0533	Water	12/05/18 08:35	12/06/18 15:34
320-45882-7	NAWC-120518-RW-081	Water	12/05/18 10:10	12/06/18 15:34
320-45882-8	NAWC-120518-FRB-081	Water	12/05/18 10:05	12/06/18 15:34
320-45882-9	NAWC-120518-RW-082	Water	12/05/18 10:40	12/06/18 15:34
320-45882-10	NAWC-120518-FRB-082	Water	12/05/18 10:35	12/06/18 15:34
320-45882-11	WGNA-120518-RW-0413	Water	12/05/18 13:40	12/06/18 15:34
320-45882-12	WGNA-120518-FRB-0413	Water	12/05/18 13:35	12/06/18 15:34
320-45882-13	WGNA-120518-DUP-53	Water	12/05/18 07:00	12/06/18 15:34

Job Narrative
320-45882-1

Receipt

The samples were received on 12/6/2018 3:34 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.7° C.

Receipt Exceptions

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): NAWC-120518-FRB-154 (320-45882-4). The container date lists 11/01/18, while the COC lists 12/5/18 for 1 of 2 containers.

LCMS

Method(s) 537: The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-264464.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-45882-1

Qualifiers

LCMS

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-45882-1

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537	Extraction of Perfluorinated Alkyl Acids	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-45882-1

SDG No.: _____

Matrix: Water

Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-120518-RW-026 3	320-45882-1	96	82
WGNA-120518-FRB-02 63	320-45882-2	102	98
NAWC-120518-RW-154	320-45882-3	96	99
NAWC-120518-FRB-15 4	320-45882-4	95	90
WGNA-120518-RW-053 3	320-45882-5	94	86
WGNA-120518-FRB-05 33	320-45882-6	105	98
NAWC-120518-RW-081	320-45882-7	87	90
NAWC-120518-FRB-08 1	320-45882-8	104	92
NAWC-120518-RW-082	320-45882-9	96	93
NAWC-120518-FRB-08 2	320-45882-10	98	93
WGNA-120518-RW-041 3	320-45882-11	94	92
WGNA-120518-FRB-04 13	320-45882-12	89	83
WGNA-120518-DUP-53	320-45882-13	94	84
	MB 320-264464/1-A	76	74
	LCS 320-264464/2-A	101	91
	LCSD 320-264464/3-A	89	92

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.12.12_537A_045.d
 Lab ID: LCS 320-264464/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	92.8	82.21	89	70-130	
Perfluorooctanoic acid (PFOA)	100	93.64	94	70-130	
Perfluorononanoic acid (PFNA)	100	88.85	89	70-130	
Perfluorohexanesulfonic acid (PFHxS)	91.0	87.50	96	70-130	
Perfluoroheptanoic acid (PFHpA)	100	91.44	91	70-130	
Perfluorobutanesulfonic acid (PFBS)	88.4	89.14	101	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2018.12.12_537A_046.d

Lab ID: LCSD 320-264464/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	92.8	86.94	94	6	30	70-130	
Perfluorooctanoic acid (PFOA)	100	90.24	90	4	30	70-130	
Perfluorononanoic acid (PFNA)	100	85.73	86	4	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	91.0	93.58	103	7	30	70-130	
Perfluoroheptanoic acid (PFHpA)	100	95.06	95	4	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	88.4	88.28	100	1	30	70-130	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Lab File ID: 2018.12.12_537A_044.d Lab Sample ID: MB 320-264464/1-A
 Matrix: Water Date Extracted: 12/11/2018 10:06
 Instrument ID: A8_N Date Analyzed: 12/13/2018 00:17
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-264464/2-A	2018.12.12_537A_045.d	12/13/2018 00:25
	LCSD 320-264464/3-A	2018.12.12_537A_046.d	12/13/2018 00:32
WGNA-120518-RW-0263	320-45882-1	2018.12.12_537A_049.d	12/13/2018 00:55
WGNA-120518-FRB-0263	320-45882-2	2018.12.12_537A_050.d	12/13/2018 01:02
NAWC-120518-RW-154	320-45882-3	2018.12.12_537A_051.d	12/13/2018 01:09
NAWC-120518-FRB-154	320-45882-4	2018.12.12_537A_052.d	12/13/2018 01:17
WGNA-120518-RW-0533	320-45882-5	2018.12.12_537A_053.d	12/13/2018 01:24
WGNA-120518-FRB-0533	320-45882-6	2018.12.12_537A_056.d	12/13/2018 01:47
NAWC-120518-RW-081	320-45882-7	2018.12.12_537A_057.d	12/13/2018 01:54
NAWC-120518-FRB-081	320-45882-8	2018.12.12_537A_058.d	12/13/2018 02:02
NAWC-120518-RW-082	320-45882-9	2018.12.12_537A_059.d	12/13/2018 02:09
NAWC-120518-FRB-082	320-45882-10	2018.12.12_537A_060.d	12/13/2018 02:17
WGNA-120518-RW-0413	320-45882-11	2018.12.12_537A_061.d	12/13/2018 02:24
WGNA-120518-FRB-0413	320-45882-12	2018.12.12_537A_062.d	12/13/2018 02:32
WGNA-120518-DUP-53	320-45882-13	2018.12.12_537A_063.d	12/13/2018 02:39

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-264464/1-A
 Matrix: Water Lab File ID: 2018.12.12_537A_044.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/11/2018 10:06
 Sample wt/vol: 250 (mL) Date Analyzed: 12/13/2018 00:17
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 264881 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.00	U	5.00	2.00	0.950
335-67-1	Perfluorooctanoic acid (PFOA)	6.00	U	7.00	6.00	2.70
375-95-1	Perfluorononanoic acid (PFNA)	1.00	U	5.00	1.00	0.470
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.00	U	5.00	2.00	0.640
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.00	U	5.00	3.00	1.30
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.00	U	5.00	2.00	0.800

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	76		70-130
STL00996	13C2 PFDA	74		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 12/07/2018 15:06
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 12/07/2018 15:50
 Calibration ID: 42659

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	3528472	3.19	2654650	3.59		
UPPER LIMIT	5292708	3.69	3981975	4.09		
LOWER LIMIT	1764236	2.69	1327325	3.09		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-263818/10		3854163	3.20	2764360	3.59	
ICV 320-263818/12		3693184	3.19	2637299	3.57	
CCVL 320-264873/1		4054695	3.19	2861418	3.57	
CCV 320-264881/39 CCVIS		3533826	3.17	2640883	3.57	
MB 320-264464/1-A		4107455	3.17	2936150	3.56	
LCS 320-264464/2-A		3762705	3.17	2848346	3.56	
LCSD 320-264464/3-A		3920807	3.17	2767790	3.56	
320-45882-1	WGNA-120518-RW-0263	3805145	3.17	2896061	3.56	
320-45882-2	WGNA-120518-FRB-0263	3465338	3.17	2639748	3.54	
320-45882-3	NAWC-120518-RW-154	3587829	3.17	2746721	3.56	
320-45882-4	NAWC-120518-FRB-154	3756276	3.17	2701507	3.57	
320-45882-5	WGNA-120518-RW-0533	3769013	3.17	2829610	3.56	
CCV 320-264881/51 CCVIS		3493319	3.17	2638815	3.56	
CCV 320-264883/51 CCVIS		3493319	3.17	2638815	3.56	
320-45882-6	WGNA-120518-FRB-0533	3480235	3.17	2644529	3.56	
320-45882-7	NAWC-120518-RW-081	3667308	3.17	2744400	3.56	
320-45882-8	NAWC-120518-FRB-081	3598027	3.17	2695492	3.56	
320-45882-9	NAWC-120518-RW-082	3570067	3.17	2759542	3.56	
320-45882-10	NAWC-120518-FRB-082	3545344	3.17	2717467	3.56	
320-45882-11	WGNA-120518-RW-0413	3638104	3.17	2619429	3.56	
320-45882-12	WGNA-120518-FRB-0413	3417476	3.17	2745815	3.56	
320-45882-13	WGNA-120518-DUP-53	3472407	3.17	2597714	3.56	
CCV 320-264883/61 CCVIS		3154145	3.16	2403394	3.54	

13PFOA = 13C2 PFOA
 PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Sample No.: CCV 320-264881/39 Date Analyzed: 12/13/2018 00:02
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.12.12_537A_042 Heated Purge: (Y/N) N
 Calibration ID: 42659

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3533826	3.17	2640883	3.57		
UPPER LIMIT	4947356	3.67	3697236	4.07		
LOWER LIMIT	2473678	2.67	1848618	3.07		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-264464/1-A		4107455	3.17	2936150	3.56	
LCS 320-264464/2-A		3762705	3.17	2848346	3.56	
LCSD 320-264464/3-A		3920807	3.17	2767790	3.56	
320-45882-1	WGNA-120518-RW-0263	3805145	3.17	2896061	3.56	
320-45882-2	WGNA-120518-FRB-0263	3465338	3.17	2639748	3.54	
320-45882-3	NAWC-120518-RW-154	3587829	3.17	2746721	3.56	
320-45882-4	NAWC-120518-FRB-154	3756276	3.17	2701507	3.57	
320-45882-5	WGNA-120518-RW-0533	3769013	3.17	2829610	3.56	

13PFOA = 13C2 PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Sample No.: CCV 320-264881/51 Date Analyzed: 12/13/2018 01:32
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.12.12_537A_054 Heated Purge: (Y/N) N
 Calibration ID: 42659

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3493319	3.17	2638815	3.56		
UPPER LIMIT	4890647	3.67	3694341	4.06		
LOWER LIMIT	2445323	2.67	1847171	3.06		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-264464/1-A		4107455	3.17	2936150	3.56	
LCS 320-264464/2-A		3762705	3.17	2848346	3.56	
LCSD 320-264464/3-A		3920807	3.17	2767790	3.56	
320-45882-1	WGNA-120518-RW-0263	3805145	3.17	2896061	3.56	
320-45882-2	WGNA-120518-FRB-0263	3465338	3.17	2639748	3.54	
320-45882-3	NAWC-120518-RW-154	3587829	3.17	2746721	3.56	
320-45882-4	NAWC-120518-FRB-154	3756276	3.17	2701507	3.57	
320-45882-5	WGNA-120518-RW-0533	3769013	3.17	2829610	3.56	

13PFOA = 13C2 PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Sample No.: CCV 320-264883/51 Date Analyzed: 12/13/2018 01:32
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.12.12_537A_054 Heated Purge: (Y/N) N
 Calibration ID: 42659

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3493319	3.17	2638815	3.56		
UPPER LIMIT	4890647	3.67	3694341	4.06		
LOWER LIMIT	2445323	2.67	1847171	3.06		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-45882-6	WGNA-120518-FRB-0533	3480235	3.17	2644529	3.56	
320-45882-7	NAWC-120518-RW-081	3667308	3.17	2744400	3.56	
320-45882-8	NAWC-120518-FRB-081	3598027	3.17	2695492	3.56	
320-45882-9	NAWC-120518-RW-082	3570067	3.17	2759542	3.56	
320-45882-10	NAWC-120518-FRB-082	3545344	3.17	2717467	3.56	
320-45882-11	WGNA-120518-RW-0413	3638104	3.17	2619429	3.56	
320-45882-12	WGNA-120518-FRB-0413	3417476	3.17	2745815	3.56	
320-45882-13	WGNA-120518-DUP-53	3472407	3.17	2597714	3.56	

13PFOA = 13C2 PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Sample No.: CCV 320-264883/61 Date Analyzed: 12/13/2018 02:47
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.12.12_537A_064 Heated Purge: (Y/N) N
 Calibration ID: 42659

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3154145	3.16	2403394	3.54		
UPPER LIMIT	4415803	3.66	3364752	4.04		
LOWER LIMIT	2207902	2.66	1682376	3.04		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-45882-6	WGNA-120518-FRB-0533	3480235	3.17	2644529	3.56	
320-45882-7	NAWC-120518-RW-081	3667308	3.17	2744400	3.56	
320-45882-8	NAWC-120518-FRB-081	3598027	3.17	2695492	3.56	
320-45882-9	NAWC-120518-RW-082	3570067	3.17	2759542	3.56	
320-45882-10	NAWC-120518-FRB-082	3545344	3.17	2717467	3.56	
320-45882-11	WGNA-120518-RW-0413	3638104	3.17	2619429	3.56	
320-45882-12	WGNA-120518-FRB-0413	3417476	3.17	2745815	3.56	
320-45882-13	WGNA-120518-DUP-53	3472407	3.17	2597714	3.56	

13PFOA = 13C2 PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1 Analy Batch No.: 263818

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/07/2018 15:06 Calibration End Date: 12/07/2018 15:50 Calibration ID: 42659

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-263818/2	2018.12.07_537ICAL_003.d
Level 2	IC 320-263818/3	2018.12.07_537ICAL_004.d
Level 3	IC 320-263818/4	2018.12.07_537ICAL_005.d
Level 4	IC 320-263818/5	2018.12.07_537ICAL_006.d
Level 5	IC 320-263818/6	2018.12.07_537ICAL_007.d
Level 6	IC 320-263818/7	2018.12.07_537ICAL_008.d
Level 7	IC 320-263818/8	2018.12.07_537ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R ² OR COD	#	MIN R ² OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorobutanesulfonic acid (PFBS)	1.0988 1.1767	1.2086 1.1302	1.0474	1.1169	1.0674	Ave		1.1209			5.1		30.0				
Perfluoroheptanoic acid (PFHpA)	1.2239 1.0659	1.0707 1.0573	1.0359	1.0224	0.9766	Ave		1.0647			7.3		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.4212 1.5811	1.4959 1.4890	1.3853	1.5308	1.4287	Ave		1.4760			4.6		30.0				
Perfluorooctanoic acid (PFOA)	1.2538 1.0902	1.0919 1.0484	1.0827	1.0711	0.9868	Ave		1.0893			7.5		30.0				
Perfluorooctanesulfonic acid (PFOS)	1.2739 1.0826	1.1148 1.0827	1.0146	1.0841	1.0634	Ave		1.1023			7.4		30.0				
Perfluorononanoic acid (PFNA)	0.8864 0.8230	0.8400 0.8262	0.8111	0.8329	0.8003	Ave		0.8314			3.3		30.0				
13C2 PFHxA	0.9542 0.9684	0.9959 0.9973	0.9365	0.9604	0.8704	Ave		0.9547			4.5		30.0				
13C2 PFDA	0.7164 0.7292	0.7303 0.7164	0.7050	0.7335	0.6982	Ave		0.7184			1.9		30.0				

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
 LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
 RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1 Analy Batch No.: 263818

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/07/2018 15:06 Calibration End Date: 12/07/2018 15:50 Calibration ID: 42659

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-263818/2	2018.12.07_537ICAL_003.d
Level 2	IC 320-263818/3	2018.12.07_537ICAL_004.d
Level 3	IC 320-263818/4	2018.12.07_537ICAL_005.d
Level 4	IC 320-263818/5	2018.12.07_537ICAL_006.d
Level 5	IC 320-263818/6	2018.12.07_537ICAL_007.d
Level 6	IC 320-263818/7	2018.12.07_537ICAL_008.d
Level 7	IC 320-263818/8	2018.12.07_537ICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	27320 5447804	62153 10829607	265789	1062646	2667621	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	43264 7185923	80008 14333785	365716	1393593	3642688	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	36374 7535367	79188 14686493	361859	1499172	3675806	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	44364 7357085	81675 14227009	382620	1461416	3684632	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	33250 5261445	60183 10890349	270284	1082696	2790009	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanoic acid (PFNA)	13PF OA	Ave	31332 5548381	62765 11200160	286352	1135323	2985342	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C2 PFHxA	13PF OA	Ave	3372926 3264066	3720908 3379961	3306344	3272924	3246608	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDA	13PF OA	Ave	2532483 2457743	2728445 2428151	2488961	2499615	2604411	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD

FORM VI
 LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
 READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1 Analy Batch No.: 263818

SDG No.: _____

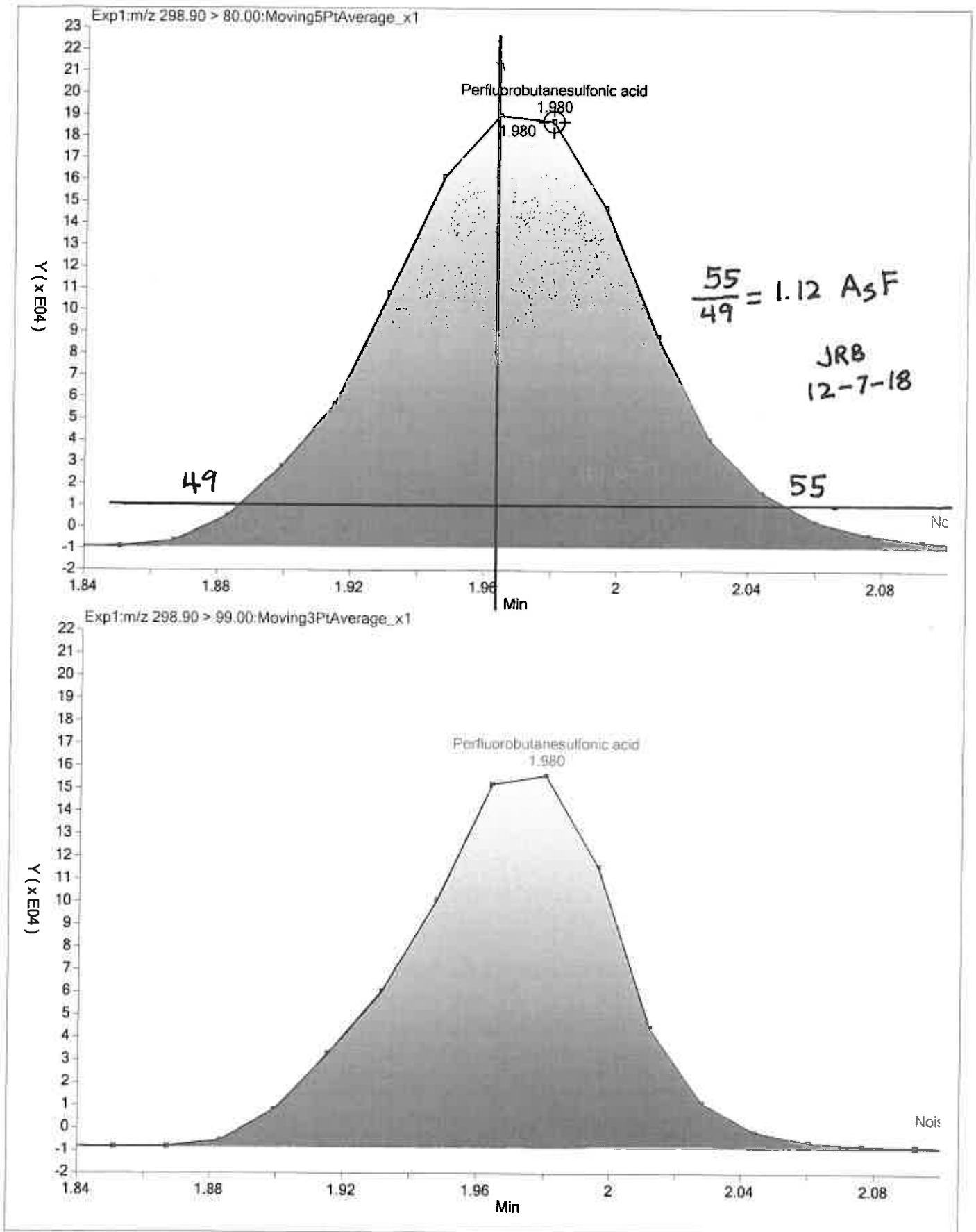
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

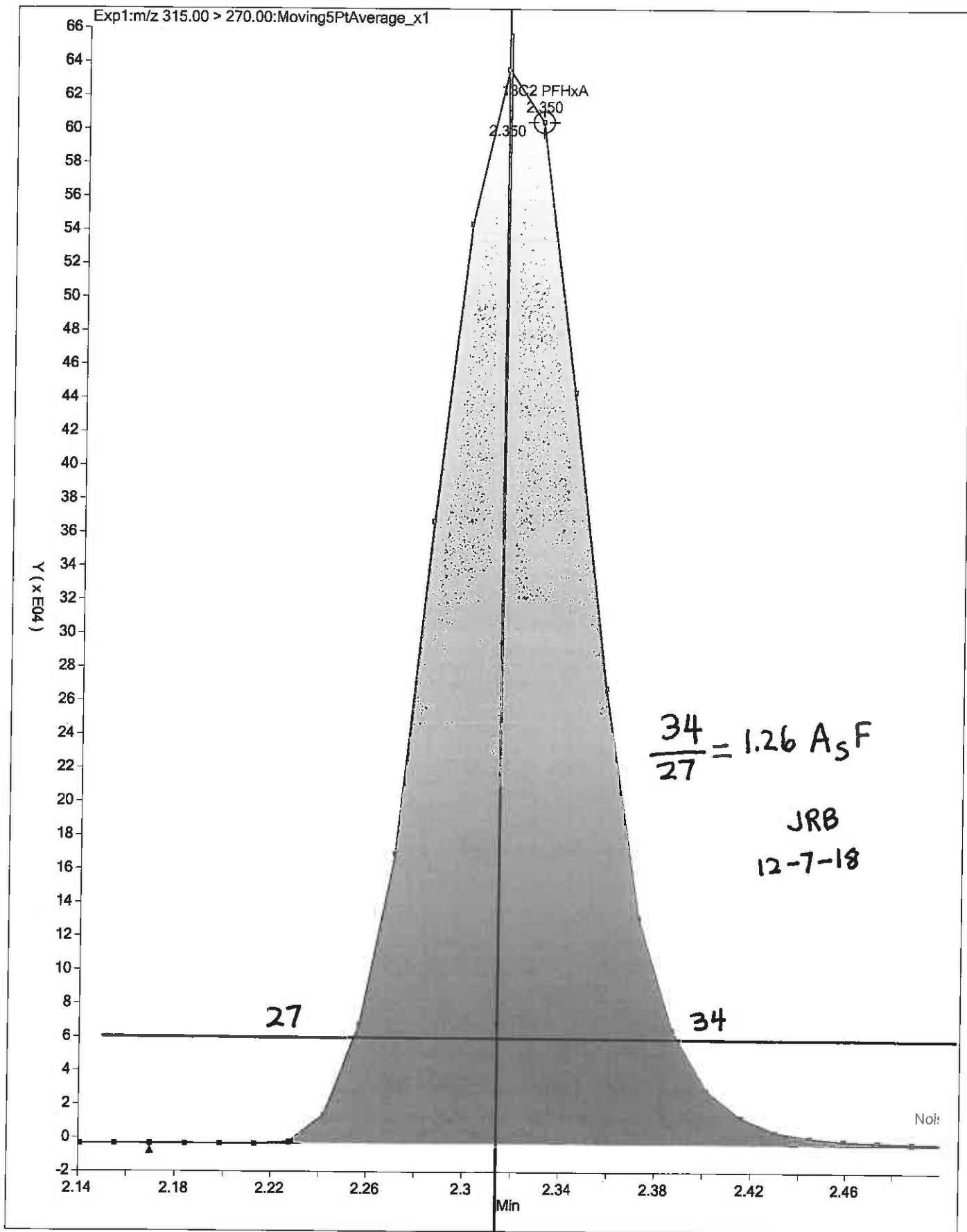
Calibration Start Date: 12/07/2018 15:06 Calibration End Date: 12/07/2018 15:50 Calibration ID: 42659

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-263818/2	2018.12.07_537ICAL_003.d
Level 2	IC 320-263818/3	2018.12.07_537ICAL_004.d
Level 3	IC 320-263818/4	2018.12.07_537ICAL_005.d
Level 4	IC 320-263818/5	2018.12.07_537ICAL_006.d
Level 5	IC 320-263818/6	2018.12.07_537ICAL_007.d
Level 6	IC 320-263818/7	2018.12.07_537ICAL_008.d
Level 7	IC 320-263818/8	2018.12.07_537ICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	-2.0 0.8	7.8	-6.6	-0.4	-4.8	5.0	50 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	15.0 -0.7	0.6	-2.7	-4.0	-8.3	0.1	50 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-3.7 0.9	1.3	-6.1	3.7	-3.2	7.1	50 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	15.1 -3.8	0.2	-0.6	-1.7	-9.4	0.1	50 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	15.6 -1.8	1.1	-8.0	-1.7	-3.5	-1.8	50 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	6.6 -0.6	1.0	-2.4	0.2	-3.7	-1.0	50 30	30	30	30	30	30
13C2 PFHxA	-0.1 4.5	4.3	-1.9	0.6	-8.8	1.4	30 30	30	30	30	30	30
13C2 PFDA	-0.3 -0.3	1.6	-1.9	2.1	-2.8	1.5	30 30	30	30	30	30	30





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-263818/10 Calibration Date: 12/07/2018 16:05
 Instrument ID: A8_N Calib Start Date: 12/07/2018 15:06
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 12/07/2018 15:50
 Lab File ID: 2018.12.07_537ICAL_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.121	1.084		9.00	0.0442	-3.3	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.065	1.081		1.00	0.0500	1.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.476	1.539		3.00	0.0455	4.2	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.089	1.107		2.00	0.0501	1.6	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8314	0.8012		5.00	0.0500	-3.6	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.102	1.251		4.00	0.0464	13.5	50.0
13C2 PFHxA	Ave	0.9547	0.9343		2.45	2.50	-2.1	30.0
13C2 PFDA	Ave	0.7184	0.6646		2.31	2.50	-7.5	30.0
d5-NEtFOSAA	Ave	1.065	1.074		2.52	2.50	0.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Lab Sample ID: ICV 320-263818/12 Calibration Date: 12/07/2018 16:20
 Instrument ID: A8_N Calib Start Date: 12/07/2018 15:06
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 12/07/2018 15:50
 Lab File ID: 2018.12.07_537ICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.121	1.102		9.00	1.77	-1.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.065	1.021		1.92	2.00	-4.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.476	1.548		1.91	1.82	4.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.089	1.035		1.90	2.00	-4.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.102	1.058		1.78	1.85	-4.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8314	0.7865		5.00	2.00	-5.4	30.0
13C2 PFHxA	Ave	0.9547	0.9303		2.44	2.50	-2.6	30.0
13C2 PFDA	Ave	0.7184	0.6774		2.36	2.50	-5.7	30.0
d5-NEtFOSAA	Ave	1.065	1.097		2.57	2.50	2.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-264873/1 Calibration Date: 12/12/2018 19:19
 Instrument ID: A8_N Calib Start Date: 12/07/2018 15:06
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 12/07/2018 15:50
 Lab File ID: 2018.12.12_537A_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.121	1.087		9.00	0.0442	-3.0	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.065	1.099		1.00	0.0500	3.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.476	1.524		3.00	0.0455	3.2	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.089	1.027		2.00	0.0501	-5.7	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.102	1.107		4.00	0.0464	0.4	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8314	0.7375		5.00	0.0500	-11.3	50.0
13C2 PFHxA	Ave	0.9547	0.8436		2.21	2.50	-11.6	30.0
13C2 PFDA	Ave	0.7184	0.6600		2.30	2.50	-8.1	30.0
d5-NEtFOSAA	Ave	1.065	0.9818		2.30	2.50	-7.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Lab Sample ID: CCV 320-264881/39 Calibration Date: 12/13/2018 00:02
 Instrument ID: A8_N Calib Start Date: 12/07/2018 15:06
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 12/07/2018 15:50
 Lab File ID: 2018.12.12_537A_042.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.121	1.155		9.00	0.884	3.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.065	1.047		0.983	1.00	-1.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.476	1.471		3.00	0.910	-0.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.089	1.078		0.991	1.00	-1.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8314	0.8273		5.00	1.00	-0.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.102	1.094		4.00	0.928	-0.7	30.0
13C2 PFHxA	Ave	0.9547	0.9413		2.47	2.50	-1.4	30.0
13C2 PFDA	Ave	0.7184	0.7183		2.50	2.50	-0.0	30.0
d5-NEtFOSAA	Ave	1.065	1.099		2.58	2.50	3.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Lab Sample ID: CCV 320-264881/51 Calibration Date: 12/13/2018 01:32
 Instrument ID: A8_N Calib Start Date: 12/07/2018 15:06
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 12/07/2018 15:50
 Lab File ID: 2018.12.12_537A_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.121	1.210		4.77	4.42	8.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.065	1.073		5.04	5.00	0.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.476	1.523		4.69	4.55	3.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.089	1.068		4.91	5.01	-2.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.102	1.060		4.46	4.64	-3.8	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8314	0.8005		4.81	5.00	-3.7	30.0
13C2 PFHxA	Ave	0.9547	0.9572		2.51	2.50	0.3	30.0
13C2 PFDA	Ave	0.7184	0.7209		2.51	2.50	0.3	30.0
d5-NEtFOSAA	Ave	1.065	1.036		2.43	2.50	-2.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Lab Sample ID: CCV 320-264883/51 Calibration Date: 12/13/2018 01:32
 Instrument ID: A8_N Calib Start Date: 12/07/2018 15:06
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 12/07/2018 15:50
 Lab File ID: 2018.12.12_537A_054.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.121	1.210		4.77	4.42	8.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.065	1.073		5.04	5.00	0.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.476	1.523		4.69	4.55	3.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.089	1.068		4.91	5.01	-2.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.102	1.060		4.46	4.64	-3.8	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8314	0.8005		4.81	5.00	-3.7	30.0
13C2 PFHxA	Ave	0.9547	0.9572		2.51	2.50	0.3	30.0
13C2 PFDA	Ave	0.7184	0.7209		2.51	2.50	0.3	30.0
d5-NEtFOSAA	Ave	1.065	1.036		2.43	2.50	-2.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1
 SDG No.: _____
 Lab Sample ID: CCV 320-264883/61 Calibration Date: 12/13/2018 02:47
 Instrument ID: A8_N Calib Start Date: 12/07/2018 15:06
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 12/07/2018 15:50
 Lab File ID: 2018.12.12_537A_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.121	1.238		9.00	0.884	10.5	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.065	1.181		1.11	1.00	10.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.476	1.625		3.00	0.910	10.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.089	1.100		1.01	1.00	1.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.102	1.059		4.00	0.928	-3.9	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8314	0.8098		5.00	1.00	-2.6	30.0
13C2 PFHxA	Ave	0.9547	1.045		2.74	2.50	9.5	30.0
13C2 PFDA	Ave	0.7184	0.7243		2.52	2.50	0.8	30.0
d5-NEtFOSAA	Ave	1.065	1.063		2.50	2.50	-0.2	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/07/2018 15:06

Analysis Batch Number: 263818 End Date: 12/07/2018 16:20

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-263818/2		12/07/2018 15:06	1	2018.12.07_537I CAL_003.d	GeminiC18 3x100 3(mm)
IC 320-263818/3		12/07/2018 15:13	1	2018.12.07_537I CAL_004.d	GeminiC18 3x100 3(mm)
IC 320-263818/4		12/07/2018 15:21	1	2018.12.07_537I CAL_005.d	GeminiC18 3x100 3(mm)
IC 320-263818/5 ICISAV		12/07/2018 15:28	1	2018.12.07_537I CAL_006.d	GeminiC18 3x100 3(mm)
IC 320-263818/6		12/07/2018 15:36	1	2018.12.07_537I CAL_007.d	GeminiC18 3x100 3(mm)
IC 320-263818/7		12/07/2018 15:43	1	2018.12.07_537I CAL_008.d	GeminiC18 3x100 3(mm)
IC 320-263818/8		12/07/2018 15:50	1	2018.12.07_537I CAL_009.d	GeminiC18 3x100 3(mm)
CCVL 320-263818/10		12/07/2018 16:05	1	2018.12.07_537I CAL_011.d	GeminiC18 3x100 3(mm)
ICB 320-263818/11		12/07/2018 16:13	1		GeminiC18 3x100 3(mm)
ICV 320-263818/12		12/07/2018 16:20	1	2018.12.07_537I CAL_013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/12/2018 19:19

Analysis Batch Number: 264873 End Date: 12/12/2018 20:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-264873/1		12/12/2018 19:19	1	2018.12.12_537A 004.d	GeminiC18 3x100 3(mm)
CCV 320-264873/2 CCVIS		12/12/2018 19:26	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/12/2018 19:34	1		GeminiC18 3x100 3(mm)
CCV 320-264873/14 CCVIS		12/12/2018 20:56	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/13/2018 00:02

Analysis Batch Number: 264881 End Date: 12/13/2018 01:32

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-264881/39 CCVIS		12/13/2018 00:02	1	2018.12.12_537A 042.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/13/2018 00:10	1		GeminiC18 3x100 3(mm)
MB 320-264464/1-A		12/13/2018 00:17	1	2018.12.12_537A 044.d	GeminiC18 3x100 3(mm)
LCS 320-264464/2-A		12/13/2018 00:25	1	2018.12.12_537A 045.d	GeminiC18 3x100 3(mm)
LCSD 320-264464/3-A		12/13/2018 00:32	1	2018.12.12_537A 046.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/13/2018 00:40	1		GeminiC18 3x100 3(mm)
ZZZZZ		12/13/2018 00:47	1		GeminiC18 3x100 3(mm)
320-45882-1		12/13/2018 00:55	1	2018.12.12_537A 049.d	GeminiC18 3x100 3(mm)
320-45882-2		12/13/2018 01:02	1	2018.12.12_537A 050.d	GeminiC18 3x100 3(mm)
320-45882-3		12/13/2018 01:09	1	2018.12.12_537A 051.d	GeminiC18 3x100 3(mm)
320-45882-4		12/13/2018 01:17	1	2018.12.12_537A 052.d	GeminiC18 3x100 3(mm)
320-45882-5		12/13/2018 01:24	1	2018.12.12_537A 053.d	GeminiC18 3x100 3(mm)
CCV 320-264881/51 CCVIS		12/13/2018 01:32	1	2018.12.12_537A 054.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/13/2018 01:32

Analysis Batch Number: 264883 End Date: 12/13/2018 02:47

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-264883/51 CCVIS		12/13/2018 01:32	1	2018.12.12_537A 054.d	GeminiC18 3x100 3(mm)
ZZZZZ		12/13/2018 01:39	1		GeminiC18 3x100 3(mm)
320-45882-6		12/13/2018 01:47	1	2018.12.12_537A 056.d	GeminiC18 3x100 3(mm)
320-45882-7		12/13/2018 01:54	1	2018.12.12_537A 057.d	GeminiC18 3x100 3(mm)
320-45882-8		12/13/2018 02:02	1	2018.12.12_537A 058.d	GeminiC18 3x100 3(mm)
320-45882-9		12/13/2018 02:09	1	2018.12.12_537A 059.d	GeminiC18 3x100 3(mm)
320-45882-10		12/13/2018 02:17	1	2018.12.12_537A 060.d	GeminiC18 3x100 3(mm)
320-45882-11		12/13/2018 02:24	1	2018.12.12_537A 061.d	GeminiC18 3x100 3(mm)
320-45882-12		12/13/2018 02:32	1	2018.12.12_537A 062.d	GeminiC18 3x100 3(mm)
320-45882-13		12/13/2018 02:39	1	2018.12.12_537A 063.d	GeminiC18 3x100 3(mm)
CCV 320-264883/61 CCVIS		12/13/2018 02:47	1	2018.12.12_537A 064.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1

SDG No.: _____

Batch Number: 264464 Batch Start Date: 12/11/18 10:05 Batch Analyst: Long, Tyrel W

Batch Method: 537 Batch End Date: 12/11/18 14:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00091
MB 320-264464/1		537, 537				250 mL	10.00 mL	7 SU	500 uL
LCS 320-264464/2		537, 537				250 mL	10.00 mL	7 SU	500 uL
LCSD 320-264464/3		537, 537				250 mL	10.00 mL	7 SU	500 uL
320-45882-A-1	WGNA-120518-RW-0263	537, 537	T	280.60 g	28.68 g	251.9 mL	10.00 mL	7 SU	500 uL
320-45882-A-2	WGNA-120518-FRB-0263	537, 537	T	311.67 g	27.82 g	283.9 mL	10.00 mL	7 SU	500 uL
320-45882-A-3	NAWC-120518-RW-154	537, 537	T	295.80 g	28.11 g	267.7 mL	10.00 mL	7 SU	500 uL
320-45882-A-4	NAWC-120518-FRB-154	537, 537	T	315.76 g	28.03 g	287.7 mL	10.00 mL	7 SU	500 uL
320-45882-A-5	WGNA-120518-RW-0533	537, 537	T	327.10 g	28.30 g	298.8 mL	10.00 mL	7 SU	500 uL
320-45882-A-6	WGNA-120518-FRB-0533	537, 537	T	305.00 g	28.59 g	276.4 mL	10.00 mL	7 SU	500 uL
320-45882-A-7	NAWC-120518-RW-081	537, 537	T	320.14 g	28.84 g	291.3 mL	10.00 mL	7 SU	500 uL
320-45882-A-8	NAWC-120518-FRB-081	537, 537	T	318.77 g	27.69 g	291.1 mL	10.00 mL	7 SU	500 uL
320-45882-A-9	NAWC-120518-RW-082	537, 537	T	306.50 g	30.16 g	276.3 mL	10.00 mL	7 SU	500 uL
320-45882-A-10	NAWC-120518-FRB-082	537, 537	T	314.18 g	27.49 g	286.7 mL	10.00 mL	7 SU	500 uL
320-45882-A-11	WGNA-120518-RW-0413	537, 537	T	322.07 g	28.32 g	293.8 mL	10.00 mL	7 SU	500 uL
320-45882-A-12	WGNA-120518-FRB-0413	537, 537	T	311.67 g	27.75 g	283.9 mL	10.00 mL	7 SU	500 uL
320-45882-A-13	WGNA-120518-DUP-53	537, 537	T	285.42 g	28.00 g	257.4 mL	10.00 mL	7 SU	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-SU 00088	LC537MSP 00001	AnalysisComment			
MB 320-264464/1		537, 537		500 uL		Chlorine ND			
LCS 320-264464/2		537, 537		500 uL	500 uL	Chlorine ND			
LCSD 320-264464/3		537, 537		500 uL	500 uL	Chlorine ND			
320-45882-A-1	WGNA-120518-RW-0263	537, 537	T	500 uL		Chlorine ND			

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1

SDG No.: _____

Batch Number: 264464 Batch Start Date: 12/11/18 10:05 Batch Analyst: Long, Tyrel W

Batch Method: 537 Batch End Date: 12/11/18 14:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-SU 00088	LC537MSP 00001	AnalysisComment			
320-45882-A-2	WGNA-120518-FRB-0263	537, 537	T	500 uL		Chlorine ND			
320-45882-A-3	NAWC-120518-RW-154	537, 537	T	500 uL		Chlorine ND			
320-45882-A-4	NAWC-120518-FRB-154	537, 537	T	500 uL		Chlorine ND			
320-45882-A-5	WGNA-120518-RW-0533	537, 537	T	500 uL		Chlorine ND			
320-45882-A-6	WGNA-120518-FRB-0533	537, 537	T	500 uL		Chlorine ND			
320-45882-A-7	NAWC-120518-RW-081	537, 537	T	500 uL		Chlorine ND			
320-45882-A-8	NAWC-120518-FRB-081	537, 537	T	500 uL		Chlorine ND			
320-45882-A-9	NAWC-120518-RW-082	537, 537	T	500 uL		Chlorine ND			
320-45882-A-10	NAWC-120518-FRB-082	537, 537	T	500 uL		Chlorine ND			
320-45882-A-11	WGNA-120518-RW-0413	537, 537	T	500 uL		Chlorine ND			
320-45882-A-12	WGNA-120518-FRB-0413	537, 537	T	500 uL		Chlorine ND			
320-45882-A-13	WGNA-120518-DUP-53	537, 537	T	500 uL		Chlorine ND			

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-45882-1

SDG No.: _____

Batch Number: 264464 Batch Start Date: 12/11/18 10:05 Batch Analyst: Long, Tyrel W

Batch Method: 537 Batch End Date: 12/11/18 14:00

Batch Notes	
Analyst ID - Aliquot Step	TWL
Batch Comment	Client labels match TA labels, TWL 12-11-18
Analyst ID - Final Volume Step	TWL
Internal Standard ID#	1451881
Manifold ID	Q,C
Methanol ID	1454398
pH Indicator ID	3718
Pipette ID	I46162G
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	MYV
Analyst ID - SU Reagent Drop	TWL
Analyst ID - SU Reagent Drop Witness	MYV
Analyst ID - TA Reagent Drop	TWL
Analyst ID - TA Reagent Drop Witness	MYV
SPE Cartridge Lot ID	6413968-05
Trizma ID	SLBR5241V
Reagent Water ID	12-06-18

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

PFAS Calibration Calculations:

Initial Calibration
Instrument A8_N

12/7/2018

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
0.025	44364	3534903	2.5	1.25503	1.2538
0.0501	81675	3736172	2.5	1.09085	1.0919
0.25	382620	3530447	2.5	1.08377	1.0827
1	1461416	3407730	2.5	1.07213	1.0711
2.5	3684632	3730120	2.5	0.98781	0.9868
5.01	7357085	3370676	2.5	1.08916	1.0902
10	14227009	3389257	2.5	1.04942	1.0484
Average				1.08974	1.0893
Standard Deviation				0.0813	
RSD				0.0746	
%RSD				7.46290	7.5

Continuing Calibration

12/12/2018 @ 19:19

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
0.0501	83394	4054695	2.5	1.0263	-5.78254	1.027	-5.7

Sample Identification
Compound

WGNA-120518-RW-0263
PFOA

Compound Area	593251	Average RRF	1.0893
Internal Standard Amount (ng)	2.5	Sample Volume(ml)	251.9
Dilution Factor	1	Volume Extract (ml)	10
Internal Standard Area	3805145		

Concentration	14.2047 ng/L
Reported Result	14.2 ng/L

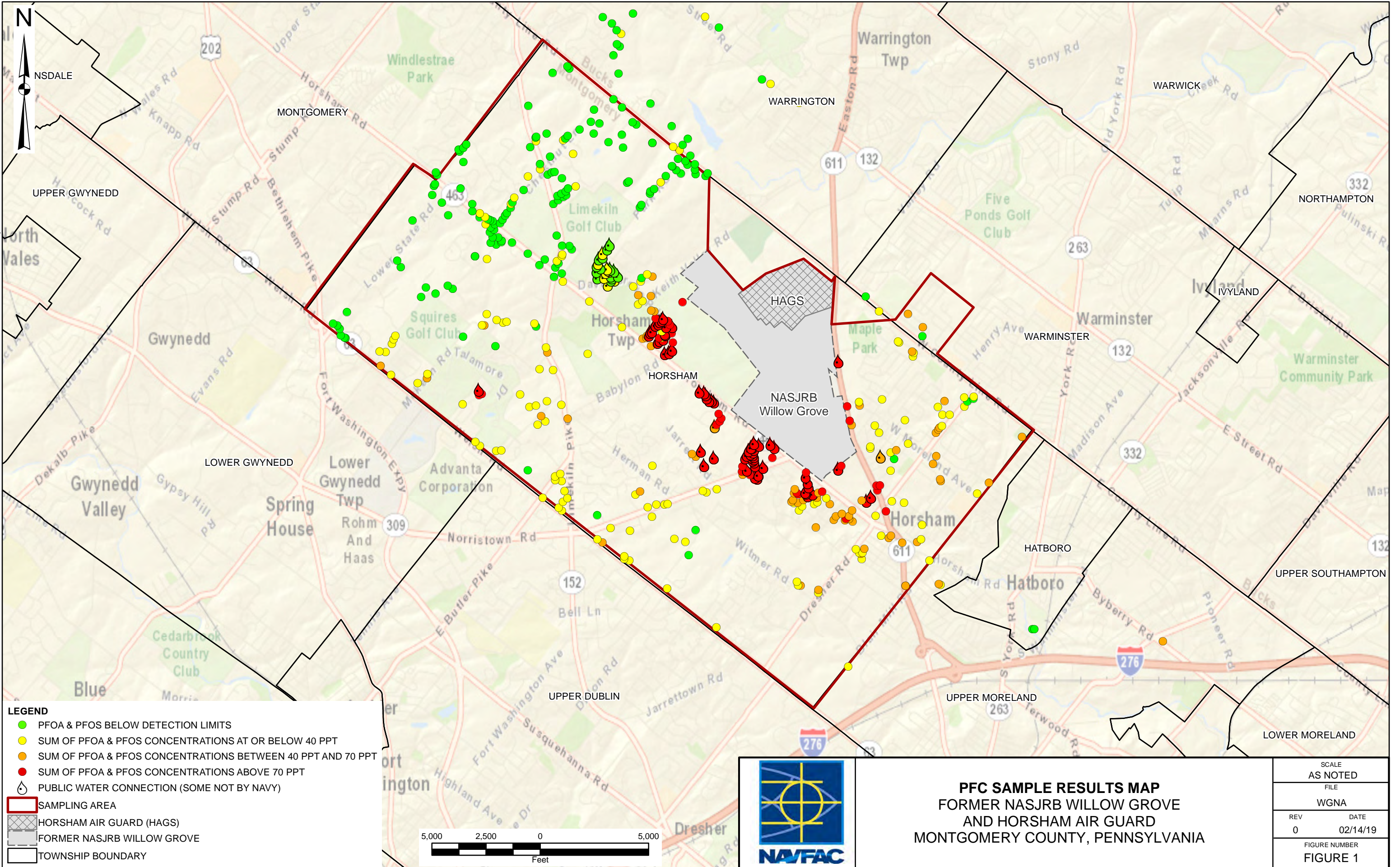
Surrogate PFHxA

Compound Area	3482388		
Internal Standard Amount (ng)	10		
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	3805145	Injection Volume (µl)	1
Average RRF	0.9547		
Concentration	9.5860		
Surrogate %R	95.86	Spike amount	10

LCS/LCSD %R

320-264464/2-A			
PFOA	Spike amount	LCS concentration	
93.64	100	93.64	
320-264464/3-A			
PFOA	Spike amount	LCS concentration	
90.24	100	90.24	
RPD		3.70	

C:\AI\Projects\112008005\WE04\F.S.DR.031\WGNA_201901.mxd MKB 2/14/2019



LEGEND

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- HORSHAM AIR GUARD (HAGS)
- FORMER NASJRB WILLOW GROVE
- TOWNSHIP BOUNDARY



**PFC SAMPLE RESULTS MAP
FORMER NASJRB WILLOW GROVE
AND HORSHAM AIR GUARD
MONTGOMERY COUNTY, PENNSYLVANIA**

SCALE AS NOTED	
FILE WGNA	
REV 0	DATE 02/14/19
FIGURE NUMBER FIGURE 1	