NAVFAC
Naval Facilities Engineering Command

Off-Base Drinking Water Sample Results, Electronic Data Deliverable, Data Validation Report, and the Sample Location Figure, SDG 320-44272-1

Naval Air Station Willow Grove
Willow Grove, Pennsylvania

August 2019

"NAWC-101618-RW-275","537","RES","320-44272-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","25","ng/L","","0.96","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","2.0",""
"NAWC-101618-RW-275","537","RES","320-44272-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","15","ng/L","M","2.7","DL","","TRG","","","7.1","LOQ","YES","-99","","248.2","10.00","6.0",""
"NAWC-101618-RW-275","537","RES","320-44272-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","9.0","ng/L","","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","2.0",""
"NAWC-101618-RW-275","537","RES","320-44272-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","12","ng/L","","0.81","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","2.0",""
"NAWC-101618-RW-275","537","RES","320-44272-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","5.5","ng/L","","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","3.0",""
"NAWC-101618-RW-275","537","RES","320-44272-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","3.2","ng/L","J","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","1.0",""
"NAWC-101618-RW-275","537","RES","320-44272-1","TALSAC","STL00993","13C2 PFHxA","100","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","101","","248.2","10.00","0",""
"NAWC-101618-RW-275","537","RES","320-44272-1","TALSAC","STL00996","13C2 PFDA","100","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","101","","248.2","10.00","0",""
"WGNA-101618-FRB-0755","537","RES","320-44272-10","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","1.8","ng/L","U","0.87","DL","","TRG","","","4.6","LOQ","YES","-99","","273.1","10.00","1.8",""
"WGNA-101618-FRB-0755","537","RES","320-44272-10","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","5.5","ng/L","U","2.5","DL","","TRG","","","6.4","LOQ","YES","-99","","273.1","10.00","5.5",""
"WGNA-101618-FRB-0755","537","RES","320-44272-10","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","1.8","ng/L","U","0.59","DL","","TRG","","","4.6","LOQ","YES","-99","","273.1","10.00","1.8",""
"WGNA-101618-FRB-0755","537","RES","320-44272-10","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","1.8","ng/L","U","0.73","DL","","TRG","","","4.6","LOQ","YES","-99","","273.1","10.00","1.8",""
"WGNA-101618-FRB-0755","537","RES","320-44272-10","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","2.7","ng/L","U","1.2","DL","","TRG","","","4.6","LOQ","YES","-99","","273.1","10.00","2.7",""
"WGNA-101618-FRB-0755","537","RES","320-44272-10","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","0.92","ng/L","U","0.43","DL","","TRG","","","4.6","LOQ","YES","-99","","273.1","10.00","0.92",""
"WGNA-101618-FRB-0755","537","RES","320-44272-10","TALSAC","STL00993","13C2 PFHxA","89","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","91.5","","273.1","10.00","0",""
"WGNA-101618-FRB-0755","537","RES","320-44272-10","TALSAC","STL00996","13C2 PFDA","86","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","91.5","","273.1","10.00","0",""
"WGNA-101618-RW-3073","537","RES","320-44272-11","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","31","ng/L","","0.99","DL","","TRG","","","5.2","LOQ","YES","-99","","240.7","10.00","2.1",""
"WGNA-101618-RW-3073","537","RES","320-44272-11","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","11","ng/L","","2.8","DL","","TRG","","","7.3","LOQ","YES","-99","","240.7","10.00","6.2",""
"WGNA-101618-RW-3073","537","RES","320-44272-11","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","15","ng/L","","0.66","DL","","TRG","","","5.2","LOQ","YES","-99","","240.7","10.00","2.1",""
"WGNA-101618-RW-3073","537","RES","320-44272-11","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","81","ng/L","","0.83","DL","","TRG","","","5.2","LOQ","YES","-99","","240.7","10.00","2.1",""
"WGNA-101618-RW-3073","537","RES","320-44272-11","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","7.1","ng/L","","1.4","DL","","TRG","","","5.2","LOQ","YES","-99","","240.7","10.00","3.1",""
"WGNA-101618-RW-3073","537","RES","320-44272-11","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","2.5","ng/L","J M","0.49","DL","","TRG","","","5.2","LOQ","YES","-99","","240.7","10.00","1.0",""
"WGNA-101618-RW-3073","537","RES","320-44272-11","TALSAC","STL00993","13C2 PFHxA","110","ng/L","","-99","DL","","SURR","106","","-99","LOQ","YES","104","","240.7","10.00","0",""
"WGNA-101618-RW-3073","537","RES","320-44272-11","TALSAC","STL00996","13C2 PFDA","110","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","104","","240.7","10.00","0",""
"WGNA-101618-FRB-3073","537","RES","320-44272-12","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.0","ng/L","U","0.94","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","2.0",""
"WGNA-101618-FRB-3073","537","RES","320-44272-12","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","6.0","ng/L","U","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","251.8","10.00","6.0",""
"WGNA-101618-FRB-3073","537","RES","320-44272-12","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","2.0",""
"WGNA-101618-FRB-3073","537","RES","320-44272-12","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.79","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","2.0",""
"WGNA-101618-FRB-3073","537","RES","320-44272-12","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","3.0",""
"WGNA-101618-FRB-3073","537","RES","320-44272-12","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.99","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","0.99",""
"WGNA-101618-FRB-3073","537","RES","320-44272-12","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","SURR","106","","-99","LOQ","YES","99.3","","251.8","10.00","0",""
"WGNA-101618-FRB-3073","537","RES","320-44272-12","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","99.3","","251.8","10.00","0",""
"WGNA-101618-RW-3178","537","RES","320-44272-13","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","17","ng/L","","0.94","DL","","TRG","","","4.9","LOQ","YES","-99","","252.7","10.00","2.0",""
"WGNA-101618-RW-3178","537","RES","320-44272-13","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","10","ng/L","M","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","252.7","10.00","5.9",""
"WGNA-101618-RW-3178","537","RES","320-44272-13","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","7.2","ng/L","","0.63","DL","","TRG","","","4.9","LOQ","YES","-99","","252.7","10.00","2.0",""
"WGNA-101618-RW-3178","537","RES","320-44272-13","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","5.5","ng/L","","0.79","DL","","TRG","","","4.9","LOQ","YES","-99","","252.7","10.00","2.0",""
"WGNA-101618-RW-3178","537","RES","320-44272-13","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","J","1.3","DL","","TRG","","","4.9","LOQ","YES","-99","","252.7","10.00","3.0",""
"WGNA-101618-RW-3178","537","RES","320-44272-13","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.5","ng/L","J M","0.46","DL","","TRG","","","4.9","LOQ","YES","-99","","252.7","10.00","0.99",""
"WGNA-101618-RW-3178","537","RES","320-44272-13","TALSAC","STL00993","13C2
PFHxA","99","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","98.9","","252.7","10.00","0",""
"WGNA-101618-RW-3178","537","RES","320-44272-13","TALSAC","STL00996","13C2
PFDA","96","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","98.9","","252.7","10.00","0",""
"WGNA-101618-FRB-3178","537","RES","320-44272-14","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.96","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","2.0",""
"WGNA-101618-FRB-3178","537","RES","320-44272-14","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.1","ng/L","U","2.7","DL","","TRG","","","7.1","LOQ","YES","-99","","246.3","10.00","6.1",""
"WGNA-101618-FRB-3178","537","RES","320-44272-14","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.65","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","2.0",""
"WGNA-101618-FRB-3178","537","RES","320-44272-14","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.81","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","2.0",""
"WGNA-101618-FRB-3178","537","RES","320-44272-14","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","3.0",""
"WGNA-101618-FRB-3178","537","RES","320-44272-14","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.48","DL","","TRG","","","5.1","LOQ","YES","-99","","246.3","10.00","1.0",""
"WGNA-101618-FRB-3178","537","RES","320-44272-14","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","102","","246.3","10.00","0",""
"WGNA-101618-FRB-3178","537","RES","320-44272-14","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","102","","246.3","10.00","0",""
"NAWC-101618-RW-194","537","RES","320-44272-15","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","36","ng/L","","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","248.7","10.00","2.0",""
"NAWC-101618-RW-194","537","RES","320-44272-15","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","21","ng/L","M","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","248.7","10.00","6.0",""
"NAWC-101618-RW-194","537","RES","320-44272-15","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","4.5","ng/L","J","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","248.7","10.00","2.0",""
"NAWC-101618-RW-194","537","RES","320-44272-15","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","4.8","ng/L","J","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","248.7","10.00","2.0",""
"NAWC-101618-RW-194","537","RES","320-44272-15","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","7.5","ng/L","","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","248.7","10.00","3.0",""
"NAWC-101618-RW-194","537","RES","320-44272-15","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA)","4.4","ng/L","J","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","248.7","10.00","1.0",""
"NAWC-101618-RW-194","537","RES","320-44272-15","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","SURR","107","","-99","LOQ","YES","101","","248.7","10.00","0",""
"NAWC-101618-RW-194","537","RES","320-44272-15","TALSAC","STL00996","13C2
PFDA","96","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","101","","248.7","10.00","0",""
"NAWC-101618-FRB-194","537","RES","320-44272-16","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","1.9","ng/L","U","0.92","DL","","TRG","","","4.9","LOQ","YES","-99","","256.9","10.00","1.9",""
"NAWC-101618-FRB-194","537","RES","320-44272-16","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","5.8","ng/L","U","2.6","DL","","TRG","","","6.8","LOQ","YES","-99","","256.9","10.00","5.8",""
"NAWC-101618-FRB-194","537","RES","320-44272-16","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","1.9","ng/L","U","0.62","DL","","TRG","","","4.9","LOQ","YES","-99","","256.9","10.00","1.9",""
"NAWC-101618-FRB-194","537","RES","320-44272-16","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","1.9","ng/L","U","0.78","DL","","TRG","","","4.9","LOQ","YES","-99","","256.9","10.00","1.9",""
"NAWC-101618-FRB-194","537","RES","320-44272-16","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","2.9","ng/L","U","1.3","DL","","TRG","","","4.9","LOQ","YES","-99","","256.9","10.00","2.9",""
"NAWC-101618-FRB-194","537","RES","320-44272-16","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.97","ng/L","U","0.46","DL","","TRG","","","4.9","LOQ","YES","-99","","256.9","10.00","0.97",""
"NAWC-101618-FRB-194","537","RES","320-44272-16","TALSAC","STL00993","13C2
PFHxA","94","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","97.3","","256.9","10.00","0",""
"NAWC-101618-FRB-194","537","RES","320-44272-16","TALSAC","STL00996","13C2
PFDA","96","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","97.3","","256.9","10.00","0",""
"WGNA-101618-RW-3220","537","RES","320-44272-17","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","34","ng/L","","0.94","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","2.0",""
"WGNA-101618-RW-3220","537","RES","320-44272-17","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","13","ng/L","","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","253.5","10.00","5.9",""
"WGNA-101618-RW-3220","537","RES","320-44272-17","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","16","ng/L","","0.63","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","2.0",""
"WGNA-101618-RW-3220","537","RES","320-44272-17","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","96","ng/L","","0.79","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","2.0",""
"WGNA-101618-RW-3220","537","RES","320-44272-17","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","7.2","ng/L","","1.3","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","3.0",""
"WGNA-101618-RW-3220","537","RES","320-44272-17","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","2.5","ng/L","J","0.46","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","0.99",""
"WGNA-101618-RW-3220","537","RES","320-44272-17","TALSAC","STL00993","13C2
PFHxA","94","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","98.6","","253.5","10.00","0",""
"WGNA-101618-RW-3220","537","RES","320-44272-17","TALSAC","STL00996","13C2
PFDA","91","ng/L","","-99","DL","","SURR","92","","-99","LOQ","YES","98.6","","253.5","10.00","0",""
"WGNA-101618-FRB-3220","537","RES","320-44272-18","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.93","DL","","TRG","","","4.9","LOQ","YES","-99","","254.6","10.00","2.0",""
"WGNA-101618-FRB-3220","537","RES","320-44272-18","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","5.9","ng/L","U","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","254.6","10.00","5.9",""
"WGNA-101618-FRB-3220","537","RES","320-44272-18","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.63","DL","","TRG","","","4.9","LOQ","YES","-99","","254.6","10.00","2.0",""
"WGNA-101618-FRB-3220","537","RES","320-44272-18","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.79","DL","","TRG","","","4.9","LOQ","YES","-99","","254.6","10.00","2.0",""
"WGNA-101618-FRB-3220","537","RES","320-44272-18","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","2.9","ng/L","U","1.3","DL","","TRG","","","4.9","LOQ","YES","-99","","254.6","10.00","2.9",""
"WGNA-101618-FRB-3220","537","RES","320-44272-18","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.98","ng/L","U","0.46","DL","","TRG","","","4.9","LOQ","YES","-99","","254.6","10.00","0.98",""
"WGNA-101618-FRB-3220","537","RES","320-44272-18","TALSAC","STL00993","13C2
PFHxA","99","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","98.2","","254.6","10.00","0",""
"WGNA-101618-FRB-3220","537","RES","320-44272-18","TALSAC","STL00996","13C2
PFDA","97","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","98.2","","254.6","10.00","0",""
"WGNA-101618-RW-3193","537","RES","320-44272-19","TALSAC","1763-23-1","Perfluorooctanesulfonic acid

(PFOS)","11","ng/L","","0.96","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","2.0",""
"WGNA-101618-RW-3193","537","RES","320-44272-19","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","34","ng/L","M","2.7","DL","","TRG","","","7.1","LOQ","YES","-99","","248.2","10.00","6.0",""
"WGNA-101618-RW-3193","537","RES","320-44272-19","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","19","ng/L","M","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","2.0",""
"WGNA-101618-RW-3193","537","RES","320-44272-19","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","13","ng/L","","0.81","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","2.0",""
"WGNA-101618-RW-3193","537","RES","320-44272-19","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","18","ng/L","","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","3.0",""
"WGNA-101618-RW-3193","537","RES","320-44272-19","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.9","ng/L","J","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","248.2","10.00","1.0",""
"WGNA-101618-RW-3193","537","RES","320-44272-19","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","101","","248.2","10.00","0",""
"WGNA-101618-RW-3193","537","RES","320-44272-19","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","101","","248.2","10.00","0",""
"NAWC-101618-FRB-275","537","RES","320-44272-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.1","ng/L","U","0.98","DL","","TRG","","","5.1","LOQ","YES","-99","","243.3","10.00","2.1",""
"NAWC-101618-FRB-275","537","RES","320-44272-2","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.2","ng/L","U","2.8","DL","","TRG","","","7.2","LOQ","YES","-99","","243.3","10.00","6.2",""
"NAWC-101618-FRB-275","537","RES","320-44272-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.1","ng/L","U","0.66","DL","","TRG","","","5.1","LOQ","YES","-99","","243.3","10.00","2.1",""
"NAWC-101618-FRB-275","537","RES","320-44272-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.1","ng/L","U","0.82","DL","","TRG","","","5.1","LOQ","YES","-99","","243.3","10.00","2.1",""
"NAWC-101618-FRB-275","537","RES","320-44272-2","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.1","ng/L","U","1.3","DL","","TRG","","","5.1","LOQ","YES","-99","","243.3","10.00","3.1",""
"NAWC-101618-FRB-275","537","RES","320-44272-2","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.48","DL","","TRG","","","5.1","LOQ","YES","-99","","243.3","10.00","1.0",""
"NAWC-101618-FRB-275","537","RES","320-44272-2","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","103","","243.3","10.00","0",""
"NAWC-101618-FRB-275","537","RES","320-44272-2","TALSAC","STL00996","13C2
PFDA","110","ng/L","","-99","DL","","SURR","107","","-99","LOQ","YES","103","","243.3","10.00","0",""
"WGNA-101618-FRB-3193","537","RES","320-44272-20","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.94","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","2.0",""
"WGNA-101618-FRB-3193","537","RES","320-44272-20","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.0","ng/L","U","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","251.8","10.00","6.0",""
"WGNA-101618-FRB-3193","537","RES","320-44272-20","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","2.0",""
"WGNA-101618-FRB-3193","537","RES","320-44272-20","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.79","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","2.0",""
"WGNA-101618-FRB-3193","537","RES","320-44272-20","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","3.0",""
"WGNA-101618-FRB-3193","537","RES","320-44272-20","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.99","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","251.8","10.00","0.99",""
"WGNA-101618-FRB-3193","537","RES","320-44272-20","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","99.3","","251.8","10.00","0",""
"WGNA-101618-FRB-3193","537","RES","320-44272-20","TALSAC","STL00996","13C2
PFDA","96","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","99.3","","251.8","10.00","0",""
"WGNA-101618-DUP-48","537","RES","320-44272-21","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","22","ng/L","","0.94","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","2.0",""
"WGNA-101618-DUP-48","537","RES","320-44272-21","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","20","ng/L","M","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","253.5","10.00","5.9",""
"WGNA-101618-DUP-48","537","RES","320-44272-21","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","6.9","ng/L","","0.63","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","2.0",""
"WGNA-101618-DUP-48","537","RES","320-44272-21","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","6.2","ng/L","","0.79","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","2.0",""
"WGNA-101618-DUP-48","537","RES","320-44272-21","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","7.2","ng/L","","1.3","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","3.0",""
"WGNA-101618-DUP-48","537","RES","320-44272-21","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","3.4","ng/L","J","0.46","DL","","TRG","","","4.9","LOQ","YES","-99","","253.5","10.00","0.99",""
"WGNA-101618-DUP-48","537","RES","320-44272-21","TALSAC","STL00993","13C2
PFHxA","98","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","98.6","","253.5","10.00","0",""
"WGNA-101618-DUP-48","537","RES","320-44272-21","TALSAC","STL00996","13C2
PFDA","96","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","98.6","","253.5","10.00","0",""
"WGNA-101618-RW-4852","537","RES","320-44272-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","9.9","ng/L","M","0.93","DL","","TRG","","","4.9","LOQ","YES","-99","","254.7","10.00","2.0",""
"WGNA-101618-RW-4852","537","RES","320-44272-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","9.0","ng/L","M","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","254.7","10.00","5.9",""
"WGNA-101618-RW-4852","537","RES","320-44272-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","3.7","ng/L","J","0.63","DL","","TRG","","","4.9","LOQ","YES","-99","","254.7","10.00","2.0",""
"WGNA-101618-RW-4852","537","RES","320-44272-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","7.6","ng/L","","0.79","DL","","TRG","","","4.9","LOQ","YES","-99","","254.7","10.00","2.0",""
"WGNA-101618-RW-4852","537","RES","320-44272-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.6","ng/L","J M","1.3","DL","","TRG","","","4.9","LOQ","YES","-99","","254.7","10.00","2.9",""
"WGNA-101618-RW-4852","537","RES","320-44272-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","2.1","ng/L","J","0.46","DL","","TRG","","","4.9","LOQ","YES","-99","","254.7","10.00","0.98",""
"WGNA-101618-RW-4852","537","RES","320-44272-3","TALSAC","STL00993","13C2
PFHxA","97","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","98.2","","254.7","10.00","0",""
"WGNA-101618-RW-4852","537","RES","320-44272-3","TALSAC","STL00996","13C2
PFDA","97","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","98.2","","254.7","10.00","0",""
"WGNA-101618-FRB-4852","537","RES","320-44272-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","1.9","ng/L","U","0.91","DL","","TRG","","","4.8","LOQ","YES","-99","","259.9","10.00","1.9",""
"WGNA-101618-FRB-4852","537","RES","320-44272-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","5.8","ng/L","U","2.6","DL","","TRG","","","6.7","LOQ","YES","-99","","259.9","10.00","5.8",""
"WGNA-101618-FRB-4852","537","RES","320-44272-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","1.9","ng/L","U","0.62","DL","","TRG","","","4.8","LOQ","YES","-99","","259.9","10.00","1.9",""
"WGNA-101618-FRB-4852","537","RES","320-44272-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","1.9","ng/L","U","0.77","DL","","TRG","","","4.8","LOQ","YES","-99","","259.9","10.00","1.9",""
"WGNA-101618-FRB-4852","537","RES","320-44272-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","2.9","ng/L","U","1.3","DL","","TRG","","","4.8","LOQ","YES","-99","","259.9","10.00","2.9",""
"WGNA-101618-FRB-4852","537","RES","320-44272-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.96","ng/L","U","0.45","DL","","TRG","","","4.8","LOQ","YES","-99","","259.9","10.00","0.96",""
"WGNA-101618-FRB-4852","537","RES","320-44272-4","TALSAC","STL00993","13C2
PFHxA","98","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","96.2","","259.9","10.00","0",""
"WGNA-101618-FRB-4852","537","RES","320-44272-4","TALSAC","STL00996","13C2
PFDA","98","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","96.2","","259.9","10.00","0",""
"WGNA-101618-RW-3124","537","RES","320-44272-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","14","ng/L","","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","249.2","10.00","2.0",""
"WGNA-101618-RW-3124","537","RES","320-44272-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","17","ng/L","M","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","249.2","10.00","6.0",""
"WGNA-101618-RW-3124","537","RES","320-44272-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","9.4","ng/L","","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","249.2","10.00","2.0",""
"WGNA-101618-RW-3124","537","RES","320-44272-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","5.7","ng/L","","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","249.2","10.00","2.0",""
"WGNA-101618-RW-3124","537","RES","320-44272-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","4.2","ng/L","J","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","249.2","10.00","3.0",""
"WGNA-101618-RW-3124","537","RES","320-44272-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.7","ng/L","J M","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","249.2","10.00","1.0",""
"WGNA-101618-RW-3124","537","RES","320-44272-5","TALSAC","STL00993","13C2

PFHxA","100","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","100","","249.2","10.00","0",""
"WGNA-101618-RW-3124","537","RES","320-44272-5","TALSAC","STL00996","13C2
PFDA","94","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","100","","249.2","10.00","0",""
"WGNA-101618-FRB-3124","537","RES","320-44272-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.1","ng/L","U","0.98","DL","","TRG","","","5.2","LOQ","YES","-99","","242.7","10.00","2.1",""
"WGNA-101618-FRB-3124","537","RES","320-44272-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.2","ng/L","U","2.8","DL","","TRG","","","7.2","LOQ","YES","-99","","242.7","10.00","6.2",""
"WGNA-101618-FRB-3124","537","RES","320-44272-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.1","ng/L","U","0.66","DL","","TRG","","","5.2","LOQ","YES","-99","","242.7","10.00","2.1",""
"WGNA-101618-FRB-3124","537","RES","320-44272-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.1","ng/L","U","0.82","DL","","TRG","","","5.2","LOQ","YES","-99","","242.7","10.00","2.1",""
"WGNA-101618-FRB-3124","537","RES","320-44272-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.1","ng/L","U","1.3","DL","","TRG","","","5.2","LOQ","YES","-99","","242.7","10.00","3.1",""
"WGNA-101618-FRB-3124","537","RES","320-44272-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.48","DL","","TRG","","","5.2","LOQ","YES","-99","","242.7","10.00","1.0",""
"WGNA-101618-FRB-3124","537","RES","320-44272-6","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","103","","242.7","10.00","0",""
"WGNA-101618-FRB-3124","537","RES","320-44272-6","TALSAC","STL00996","13C2
PFDA","99","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","103","","242.7","10.00","0",""
"WGNA-101618-RW-0404","537","RES","320-44272-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","24","ng/L","","0.94","DL","","TRG","","","4.9","LOQ","YES","-99","","252.9","10.00","2.0",""
"WGNA-101618-RW-0404","537","RES","320-44272-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","19","ng/L","M","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","252.9","10.00","5.9",""
"WGNA-101618-RW-0404","537","RES","320-44272-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","7.0","ng/L","","0.63","DL","","TRG","","","4.9","LOQ","YES","-99","","252.9","10.00","2.0",""
"WGNA-101618-RW-0404","537","RES","320-44272-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","6.3","ng/L","","0.79","DL","","TRG","","","4.9","LOQ","YES","-99","","252.9","10.00","2.0",""
"WGNA-101618-RW-0404","537","RES","320-44272-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","6.5","ng/L","","1.3","DL","","TRG","","","4.9","LOQ","YES","-99","","252.9","10.00","3.0",""
"WGNA-101618-RW-0404","537","RES","320-44272-7","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","3.2","ng/L","J","0.46","DL","","TRG","","","4.9","LOQ","YES","-99","","252.9","10.00","0.99",""
"WGNA-101618-RW-0404","537","RES","320-44272-7","TALSAC","STL00993","13C2
PFHxA","96","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","98.9","","252.9","10.00","0",""
"WGNA-101618-RW-0404","537","RES","320-44272-7","TALSAC","STL00996","13C2
PFDA","97","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","98.9","","252.9","10.00","0",""
"WGNA-101618-FRB-0404","537","RES","320-44272-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.94","DL","","TRG","","","4.9","LOQ","YES","-99","","253.9","10.00","2.0",""
"WGNA-101618-FRB-0404","537","RES","320-44272-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","5.9","ng/L","U","2.7","DL","","TRG","","","6.9","LOQ","YES","-99","","253.9","10.00","5.9",""
"WGNA-101618-FRB-0404","537","RES","320-44272-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.63","DL","","TRG","","","4.9","LOQ","YES","-99","","253.9","10.00","2.0",""
"WGNA-101618-FRB-0404","537","RES","320-44272-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.79","DL","","TRG","","","4.9","LOQ","YES","-99","","253.9","10.00","2.0",""
"WGNA-101618-FRB-0404","537","RES","320-44272-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.9","LOQ","YES","-99","","253.9","10.00","3.0",""
"WGNA-101618-FRB-0404","537","RES","320-44272-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.98","ng/L","U","0.46","DL","","TRG","","","4.9","LOQ","YES","-99","","253.9","10.00","0.98",""
"WGNA-101618-FRB-0404","537","RES","320-44272-8","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","98.5","","253.9","10.00","0",""
"WGNA-101618-FRB-0404","537","RES","320-44272-8","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","98.5","","253.9","10.00","0",""
"WGNA-101618-RW-0755","537","RES","320-44272-9","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","27","ng/L","","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","250.2","10.00","2.0",""
"WGNA-101618-RW-0755","537","RES","320-44272-9","TALSAC","335-67-1","Perfluorooctanoic acid

(PFOA)","20","ng/L","M","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","250.2","10.00","6.0",""
"WGNA-101618-RW-0755","537","RES","320-44272-9","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","32","ng/L","M","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","250.2","10.00","2.0",""
"WGNA-101618-RW-0755","537","RES","320-44272-9","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","5.9","ng/L","","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","250.2","10.00","2.0",""
"WGNA-101618-RW-0755","537","RES","320-44272-9","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","5.1","ng/L","","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","250.2","10.00","3.0",""
"WGNA-101618-RW-0755","537","RES","320-44272-9","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.6","ng/L","J M","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","250.2","10.00","1.0",""
"WGNA-101618-RW-0755","537","RES","320-44272-9","TALSAC","STL00993","13C2
PFHxA","98","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","99.9","","250.2","10.00","0",""
"WGNA-101618-RW-0755","537","RES","320-44272-9","TALSAC","STL00996","13C2
PFDA","96","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","99.9","","250.2","10.00","0",""
"WGNA-101618-RW-0755MS","537","RES","320-44272-9MS","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","27.9","ng/L","4","0.92","DL","","SPK","36","","4.8","LOQ","YES","3.58","WGNA-101618-RW-
0755","259.5","10.00","1.9",""
"WGNA-101618-RW-0755MS","537","RES","320-44272-9MS","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","23.8","ng/L","M 4","2.6","DL","","SPK","109","","6.7","LOQ","YES","3.86","WGNA-101618-RW-
0755","259.5","10.00","5.8",""
"WGNA-101618-RW-0755MS","537","RES","320-44272-9MS","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","34.5","ng/L","4","0.62","DL","","SPK","65","","4.8","LOQ","YES","3.51","WGNA-101618-RW-
0755","259.5","10.00","1.9",""
"WGNA-101618-RW-0755MS","537","RES","320-44272-9MS","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","9.19","ng/L","","0.77","DL","","SPK","97","","4.8","LOQ","YES","3.41","WGNA-101618-RW-
0755","259.5","10.00","1.9",""
"WGNA-101618-RW-0755MS","537","RES","320-44272-9MS","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","8.99","ng/L","","1.3","DL","","SPK","100","","4.8","LOQ","YES","3.85","WGNA-101618-RW-
0755","259.5","10.00","2.9",""
"WGNA-101618-RW-0755MS","537","RES","320-44272-9MS","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","4.91","ng/L","","0.45","DL","","SPK","87","","4.8","LOQ","YES","3.85","WGNA-101618-RW-
0755","259.5","10.00","0.96",""
"WGNA-101618-RW-0755MS","537","RES","320-44272-9MS","TALSAC","STL00993","13C2
PFHxA","95.8","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","96.3","WGNA-101618-RW-
0755","259.5","10.00","0",""
"WGNA-101618-RW-0755MS","537","RES","320-44272-9MS","TALSAC","STL00996","13C2
PFDA","94.5","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","96.3","WGNA-101618-RW-
0755","259.5","10.00","0",""
"WGNA-101618-RW-0755MSD","537","RES","320-44272-9MSD","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","30.3","ng/L","4","0.93","DL","","SPK","104","9","4.9","LOQ","YES","3.63","WGNA-101618-RW-
0755","255.3","10.00","2.0",""
"WGNA-101618-RW-0755MSD","537","RES","320-44272-9MSD","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","25.2","ng/L","M 4","2.6","DL","","SPK","144","6","6.9","LOQ","YES","3.92","WGNA-101618-RW-
0755","255.3","10.00","5.9",""
"WGNA-101618-RW-0755MSD","537","RES","320-44272-9MSD","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS)","37.9","ng/L","4","0.63","DL","","SPK","161","9","4.9","LOQ","YES","3.56","WGNA-101618-RW-
0755","255.3","10.00","2.0",""
"WGNA-101618-RW-0755MSD","537","RES","320-44272-9MSD","TALSAC","375-73-5","Perfluorobutanesulfonic
acid (PFBS)","9.76","ng/L","","0.78","DL","","SPK","112","6","4.9","LOQ","YES","3.46","WGNA-101618-RW-
0755","255.3","10.00","2.0",""
"WGNA-101618-RW-0755MSD","537","RES","320-44272-9MSD","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","8.38","ng/L","","1.3","DL","","SPK","83","7","4.9","LOQ","YES","3.92","WGNA-101618-RW-
0755","255.3","10.00","2.9",""
"WGNA-101618-RW-0755MSD","537","RES","320-44272-9MSD","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","5.45","ng/L","","0.46","DL","","SPK","99","10","4.9","LOQ","YES","3.92","WGNA-101618-RW-

0755","255.3","10.00","0.98",""
"WGNA-101618-RW-0755MSD","537","RES","320-44272-9MSD","TALSAC","STL00993","13C2 PFHxA","97.3","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","97.9","WGNA-101618-RW-0755","255.3","10.00","0",""
"WGNA-101618-RW-0755MSD","537","RES","320-44272-9MSD","TALSAC","STL00996","13C2 PFDA","97.8","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","97.9","WGNA-101618-RW-0755","255.3","10.00","0",""
"LCS 320-255322/2-A","537","RES","LCS 320-255322/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","177","ng/L","","0.95","DL","","SPK","95","","5.0","LOQ","YES","186","","250.00","10.00","2.0",""
"LCS 320-255322/2-A","537","RES","LCS 320-255322/2-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","198","ng/L","","2.7","DL","","SPK","99","","7.0","LOQ","YES","200","","250.00","10.00","6.0",""
"LCS 320-255322/2-A","537","RES","LCS 320-255322/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","190","ng/L","","0.64","DL","","SPK","104","","5.0","LOQ","YES","182","","250.00","10.00","2.0",""
"LCS 320-255322/2-A","537","RES","LCS 320-255322/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","194","ng/L","","0.80","DL","","SPK","110","","5.0","LOQ","YES","177","","250.00","10.00","2.0",""
"LCS 320-255322/2-A","537","RES","LCS 320-255322/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","206","ng/L","","1.3","DL","","SPK","103","","5.0","LOQ","YES","200","","250.00","10.00","3.0",""
"LCS 320-255322/2-A","537","RES","LCS 320-255322/2-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","199","ng/L","","0.47","DL","","SPK","99","","5.0","LOQ","YES","200","","250.00","10.00","1.0",""
"LCS 320-255322/2-A","537","RES","LCS 320-255322/2-A","TALSAC","STL00993","13C2 PFHxA","100","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","100","","250.00","10.00","0",""
"LCS 320-255322/2-A","537","RES","LCS 320-255322/2-A","TALSAC","STL00996","13C2 PFDA","99.7","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","100","","250.00","10.00","0",""
"LCS 320-255789/2-A","537","RES","LCS 320-255789/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","182","ng/L","","0.95","DL","","SPK","98","","5.0","LOQ","YES","186","","250","10.00","2.0",""
"LCS 320-255789/2-A","537","RES","LCS 320-255789/2-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","177","ng/L","","2.7","DL","","SPK","89","","7.0","LOQ","YES","200","","250","10.00","6.0",""
"LCS 320-255789/2-A","537","RES","LCS 320-255789/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","194","ng/L","","0.64","DL","","SPK","107","","5.0","LOQ","YES","182","","250","10.00","2.0",""
"LCS 320-255789/2-A","537","RES","LCS 320-255789/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","165","ng/L","","0.80","DL","","SPK","93","","5.0","LOQ","YES","177","","250","10.00","2.0",""
"LCS 320-255789/2-A","537","RES","LCS 320-255789/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","196","ng/L","","1.3","DL","","SPK","98","","5.0","LOQ","YES","200","","250","10.00","3.0",""
"LCS 320-255789/2-A","537","RES","LCS 320-255789/2-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","188","ng/L","","0.47","DL","","SPK","94","","5.0","LOQ","YES","200","","250","10.00","1.0",""
"LCS 320-255789/2-A","537","RES","LCS 320-255789/2-A","TALSAC","STL00993","13C2 PFHxA","93.1","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","100","","250","10.00","0",""
"LCS 320-255789/2-A","537","RES","LCS 320-255789/2-A","TALSAC","STL00996","13C2 PFDA","93.5","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","100","","250","10.00","0",""
"LCSD 320-255322/3-A","537","RES","LCSD 320-255322/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","179","ng/L","","0.95","DL","","SPK","97","2","5.0","LOQ","YES","186","LCS 320-255322/2-A","250.00","10.00","2.0",""
"LCSD 320-255322/3-A","537","RES","LCSD 320-255322/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","190","ng/L","","2.7","DL","","SPK","95","4","7.0","LOQ","YES","200","LCS 320-255322/2-A","250.00","10.00","6.0",""
"LCSD 320-255322/3-A","537","RES","LCSD 320-255322/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","193","ng/L","","0.64","DL","","SPK","106","1","5.0","LOQ","YES","182","LCS 320-255322/2-A","250.00","10.00","2.0",""
"LCSD 320-255322/3-A","537","RES","LCSD 320-255322/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","194","ng/L","","0.80","DL","","SPK","110","0","5.0","LOQ","YES","177","LCS 320-255322/2-A","250.00","10.00","2.0",""
"LCSD 320-255322/3-A","537","RES","LCSD 320-255322/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","193","ng/L","","1.3","DL","","SPK","96","7","5.0","LOQ","YES","200","LCS 320-255322/2-A","250.00","10.00","3.0",""

"LCSD 320-255322/3-A","537","RES","LCSD 320-255322/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","202","ng/L","","0.47","DL","","SPK","101","1","5.0","LOQ","YES","200","LCS 320-255322/2-A","250.00","10.00","1.0",""
"LCSD 320-255322/3-A","537","RES","LCSD 320-255322/3-A","TALSAC","STL00993","13C2 PFHxA","97.0","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","100","LCS 320-255322/2-A","250.00","10.00","0",""
"LCSD 320-255322/3-A","537","RES","LCSD 320-255322/3-A","TALSAC","STL00996","13C2 PFDA","94.1","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","100","LCS 320-255322/2-A","250.00","10.00","0",""
"LCSD 320-255789/3-A","537","RES","LCSD 320-255789/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","172","ng/L","","0.95","DL","","SPK","93","6","5.0","LOQ","YES","186","LCS 320-255789/2-A","250","10.00","2.0",""
"LCSD 320-255789/3-A","537","RES","LCSD 320-255789/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","181","ng/L","","2.7","DL","","SPK","91","2","7.0","LOQ","YES","200","LCS 320-255789/2-A","250","10.00","6.0",""
"LCSD 320-255789/3-A","537","RES","LCSD 320-255789/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","177","ng/L","","0.64","DL","","SPK","97","9","5.0","LOQ","YES","182","LCS 320-255789/2-A","250","10.00","2.0",""
"LCSD 320-255789/3-A","537","RES","LCSD 320-255789/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","172","ng/L","","0.80","DL","","SPK","97","4","5.0","LOQ","YES","177","LCS 320-255789/2-A","250","10.00","2.0",""
"LCSD 320-255789/3-A","537","RES","LCSD 320-255789/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","196","ng/L","","1.3","DL","","SPK","98","0","5.0","LOQ","YES","200","LCS 320-255789/2-A","250","10.00","3.0",""
"LCSD 320-255789/3-A","537","RES","LCSD 320-255789/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","194","ng/L","","0.47","DL","","SPK","97","3","5.0","LOQ","YES","200","LCS 320-255789/2-A","250","10.00","1.0",""
"LCSD 320-255789/3-A","537","RES","LCSD 320-255789/3-A","TALSAC","STL00993","13C2 PFHxA","95.5","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","100","LCS 320-255789/2-A","250","10.00","0",""
"LCSD 320-255789/3-A","537","RES","LCSD 320-255789/3-A","TALSAC","STL00996","13C2 PFDA","93.1","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","100","LCS 320-255789/2-A","250","10.00","0",""
"LLCS 320-255321/2-A","537","RES","LLCS 320-255321/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","3.74","ng/L","J","0.95","DL","","SPK","101","","5.0","LOQ","YES","3.71","","250.00","10.00","2.0",""
"LLCS 320-255321/2-A","537","RES","LLCS 320-255321/2-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","3.80","ng/L","J","2.7","DL","","SPK","95","","7.0","LOQ","YES","4.00","","250.00","10.00","6.0",""
"LLCS 320-255321/2-A","537","RES","LLCS 320-255321/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","3.90","ng/L","J","0.64","DL","","SPK","107","","5.0","LOQ","YES","3.64","","250.00","10.00","2.0",""
"LLCS 320-255321/2-A","537","RES","LLCS 320-255321/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","3.96","ng/L","J","0.80","DL","","SPK","112","","5.0","LOQ","YES","3.54","","250.00","10.00","2.0",""
"LLCS 320-255321/2-A","537","RES","LLCS 320-255321/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.91","ng/L","J","1.3","DL","","SPK","98","","5.0","LOQ","YES","4.00","","250.00","10.00","3.0",""
"LLCS 320-255321/2-A","537","RES","LLCS 320-255321/2-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","3.71","ng/L","J","0.47","DL","","SPK","93","","5.0","LOQ","YES","4.00","","250.00","10.00","1.0",""
"LLCS 320-255321/2-A","537","RES","LLCS 320-255321/2-A","TALSAC","STL00993","13C2 PFHxA","97.5","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","100","","250.00","10.00","0",""
"LLCS 320-255321/2-A","537","RES","LLCS 320-255321/2-A","TALSAC","STL00996","13C2 PFDA","94.6","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","100","","250.00","10.00","0",""
"MB 320-255321/1-A","537","RES","MB 320-255321/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.0","ng/L","U","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-255321/1-A","537","RES","MB 320-255321/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","6.0","ng/L","U","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","250.00","10.00","6.0",""
"MB 320-255321/1-A","537","RES","MB 320-255321/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-255321/1-A","537","RES","MB 320-255321/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-255321/1-A","537","RES","MB 320-255321/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","3.0",""
"MB 320-255321/1-A","537","RES","MB 320-255321/1-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-255321/1-A","537","RES","MB 320-255321/1-A","TALSAC","STL00993","13C2
PFHxA","100","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","100","","250.00","10.00","0",""
"MB 320-255321/1-A","537","RES","MB 320-255321/1-A","TALSAC","STL00996","13C2
PFDA","98.5","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","100","","250.00","10.00","0",""
"MB 320-255322/1-A","537","RES","MB 320-255322/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-255322/1-A","537","RES","MB 320-255322/1-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.0","ng/L","U","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","250.00","10.00","6.0",""
"MB 320-255322/1-A","537","RES","MB 320-255322/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-255322/1-A","537","RES","MB 320-255322/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","2.0",""
"MB 320-255322/1-A","537","RES","MB 320-255322/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","3.0",""
"MB 320-255322/1-A","537","RES","MB 320-255322/1-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","250.00","10.00","1.0",""
"MB 320-255322/1-A","537","RES","MB 320-255322/1-A","TALSAC","STL00993","13C2
PFHxA","96.9","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","100","","250.00","10.00","0",""
"MB 320-255322/1-A","537","RES","MB 320-255322/1-A","TALSAC","STL00996","13C2
PFDA","101","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","100","","250.00","10.00","0",""
"MB 320-255789/1-A","537","RES","MB 320-255789/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.95","DL","","TRG","","","5.0","LOQ","YES","-99","","250","10.00","2.0",""
"MB 320-255789/1-A","537","RES","MB 320-255789/1-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","6.0","ng/L","U","2.7","DL","","TRG","","","7.0","LOQ","YES","-99","","250","10.00","6.0",""
"MB 320-255789/1-A","537","RES","MB 320-255789/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","2.0","ng/L","U","0.64","DL","","TRG","","","5.0","LOQ","YES","-99","","250","10.00","2.0",""
"MB 320-255789/1-A","537","RES","MB 320-255789/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","2.0","ng/L","U","0.80","DL","","TRG","","","5.0","LOQ","YES","-99","","250","10.00","2.0",""
"MB 320-255789/1-A","537","RES","MB 320-255789/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.0","ng/L","U","1.3","DL","","TRG","","","5.0","LOQ","YES","-99","","250","10.00","3.0",""
"MB 320-255789/1-A","537","RES","MB 320-255789/1-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","1.0","ng/L","U","0.47","DL","","TRG","","","5.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-255789/1-A","537","RES","MB 320-255789/1-A","TALSAC","STL00993","13C2
PFHxA","97.4","ng/L","","-99","DL","","SURR","97","","-99","LOQ","YES","100","","250","10.00","0",""
"MB 320-255789/1-A","537","RES","MB 320-255789/1-A","TALSAC","STL00996","13C2
PFDA","96.1","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","100","","250","10.00","0",""
"Unknown","Unknown","NAWC-101618-RW-275","10/16/2018 08:10","AQ","320-44272-
1","NM","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
17:57","TALSAC","COA","WET","NA","1","NA","NA","","100","320-255321","320-255321","NA","320-
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11","NM","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
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255428","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
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12","FB","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
19:48","TALSAC","COA","WET","NA","1","NA","NA","","100","320-255321","320-255321","NA","320-
255428","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-RW-3178","10/16/2018 11:40","AQ","320-44272-
13","NM","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
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255428","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-FRB-3178","10/16/2018 11:35","AQ","320-44272-
14","FB","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
20:02","TALSAC","COA","WET","NA","1","NA","NA","","100","320-255321","320-255321","NA","320-
255428","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","NAWC-101618-RW-194","10/16/2018 12:10","AQ","320-44272-
15","NM","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
20:10","TALSAC","COA","WET","NA","1","NA","NA","","100","320-255321","320-255321","NA","320-
255428","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","NAWC-101618-FRB-194","10/16/2018 12:05","AQ","320-44272-
16","FB","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
20:17","TALSAC","COA","WET","NA","1","NA","NA","","100","320-255321","320-255321","NA","320-
255428","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-RW-3220","10/16/2018 13:10","AQ","320-44272-
17","NM","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
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255429","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-FRB-3220","10/16/2018 13:05","AQ","320-44272-
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255429","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-RW-3193","10/16/2018 13:40","AQ","320-44272-
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255429","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","NAWC-101618-FRB-275","10/16/2018 08:05","AQ","320-44272-
2","FB","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
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255426","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
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21:38","TALSAC","COA","WET","NA","1","NA","NA","","100","320-255322","320-255322","NA","320-
255429","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-RW-4852","10/16/2018 09:10","AQ","320-44272-
3","NM","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
18:12","TALSAC","COA","WET","NA","1","NA","NA","","100","320-255321","320-255321","NA","320-
255426","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
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4","FB","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
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255426","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-RW-3124","10/16/2018 09:40","AQ","320-44272-

5","NM","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
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255426","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-FRB-3124","10/16/2018 09:35","AQ","320-44272-
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255426","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-RW-0404","10/16/2018 10:10","AQ","320-44272-
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255426","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-FRB-0404","10/16/2018 10:05","AQ","320-44272-
8","FB","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
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255426","320-44272-1","10/17/2018 09:25","10/19/2018 09:05",""
"Unknown","Unknown","WGNA-101618-RW-0755","10/16/2018 10:40","AQ","320-44272-
9","NM","","3.3","537","METHOD","RES","10/27/2018 06:13","10/28/2018
19:11","TALSAC","COA","WET","NA","1","NA","NA","","100","320-255321","320-255321","NA","320-
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255426","320-44272-1","10/27/2018 06:13","10/19/2018 09:05",""
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255429","320-44272-1","10/27/2018 06:19","10/19/2018 09:05",""
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TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **A. FREBOWITZ** **DATE:** **NOVEMBER 14, 2018**

FROM: **TERRI L. SOLOMON** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)**
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-44272-1

SAMPLES: 10/Field Reagent Blank (FRB)

NAWC-101618-FRB-194	NAWC-101618-FRB-275
WGNA-101618-FRB-0404	WGNA-101618-FRB-0755
WGNA-101618-FRB-3073	WGNA-101618-FRB-3124
WGNA-101618-FRB-3178	WGNA-101618-FRB-3193
WGNA-101618-FRB-3220	WGNA-101618-FRB-4852

11/Drinking Water

NAWC-101618-RW-194	NAWC-101618-RW-275
WGNA-101618-DUP-48	WGNA-101618-RW-0404
WGNA-101618-RW-0755	WGNA-101618-RW-3073
WGNA-101618-RW-3124	WGNA-101618-RW-3178
WGNA-101618-RW-3193	WGNA-101618-RW-3220
WGNA-101618-RW-4852	

Overview

The sample set for NAS JRB Willow Grove, SDG 320-44272-1, consisted of eleven (11) drinking water samples and ten (10) 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 field duplicate pair, WGNA-101618-RW-0404 / WGNA-101618-DUP-48, was included in this SDG.

The samples were collected by Tetra Tech on October 16, 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, tune check, instrument sensitivity check, initial/continuing calibrations, ion transitions, laboratory method/FRB results, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, low level laboratory control sample 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

None.

Minor

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

- The matrix spike (MS) percent recovery (%R) for PFOS was below the quality control limit for sample WGNA-101618-RW-0755. The matrix spike duplicate (MSD) %R for PFHxS was above the quality

control limit for sample WGNA-101618-RW-0755. The sample was spiked with concentrations below the limit of quantitation (LOQ). The detected results reported for PFOS and PFHxS in the affected sample were qualified as estimated (J).

Notes

The laboratory noted that a sample bottle ID was WGNA-1016-FRB-2018. The chain of custody ID was WGNA-101618-FRB-3124. The chain of custody ID was used by the laboratory.

During the calculation verification of the matrix spike percent recoveries, the data reviewer could not verify the matrix spike and matrix spike duplicate percent recoveries reported on the Form III. The laboratory was contacted about the discrepancy. The laboratory stated that the issue was due to the laboratory information management system (LIMS) using the unrounded sample value instead of the rounded value that is reported on the form. This explanation resolved the apparent calculation percent recovery discrepancy. No validation action was required based on the finding but the laboratory was advised to correct future matrix spike recovery forms.

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

Sample	Associated FRB
NAWC-101618-RW-194	NAWC-101618-FRB-194
NAWC-101618-RW-275	NAWC-101618-FRB-275
WGNA-101618-DUP-48	WGNA-101618-FRB-0404
WGNA-101618-RW-0404	WGNA-101618-FRB-0404
WGNA-101618-RW-0755	WGNA-101618-FRB-0755
WGNA-101618-RW-3073	WGNA-101618-FRB-3073
WGNA-101618-RW-3124	WGNA-101618-FRB-3124
WGNA-101618-RW-3178	WGNA-101618-FRB-3178
WGNA-101618-RW-3193	WGNA-101618-FRB-3193
WGNA-101618-RW-3220	WGNA-101618-FRB-3220
WGNA-101618-RW-4852	WGNA-101618-FRB-4852

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

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 x 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	NSAMPLE	NAWC-101618-FRB-194			NAWC-101618-FRB-275			NAWC-101618-RW-194			NAWC-101618-RW-275		
SDG: 320-44272-1	LAB_ID	320-44272-16			320-44272-2			320-44272-15			320-44272-1		
FRACTION: PFAS	SAMP_DATE	10/16/2018			10/16/2018			10/16/2018			10/16/2018		
MEDIA: WATER	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)		5.8	U		6.2	U		21			15		
PERFLUOROBUTANESULFONIC ACID (PFBS)		1.9	U		2.1	U		4.8	J	P	12		
PERFLUOROHEPTANOIC ACID (PFHPA)		2.9	U		3.1	U		7.5			5.5		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		1.9	U		2.1	U		4.5	J	P	9		
PERFLUORONONANOIC ACID (PFNA)		0.97	U		1	U		4.4	J	P	3.2	J	P
PERFLUOROOCTANESULFONIC ACID (PFOS)		1.9	U		2.1	U		36			25		

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-101618-DUP-48			WGNA-101618-FRB-0404			WGNA-101618-FRB-0755			WGNA-101618-FRB-3073		
SDG: 320-44272-1	LAB_ID	320-44272-21			320-44272-8			320-44272-10			320-44272-12		
FRACTION: PFAS	SAMP_DATE	10/16/2018			10/16/2018			10/16/2018			10/16/2018		
MEDIA: WATER	QC_TYPE	FD			FB			FB			FB		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	WGNA-101618-RW-0404											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		20			5.9	U		5.5	U		6	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		6.2			2	U		1.8	U		2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		7.2			3	U		2.7	U		3	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		6.9			2	U		1.8	U		2	U	
PERFLUORONONANOIC ACID (PFNA)		3.4	J	P	0.98	U		0.92	U		0.99	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		22			2	U		1.8	U		2	U	

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-101618-FRB-3124			WGNA-101618-FRB-3178			WGNA-101618-FRB-3193			WGNA-101618-FRB-3220		
SDG: 320-44272-1	LAB_ID	320-44272-6			320-44272-14			320-44272-20			320-44272-18		
FRACTION: PFAS	SAMP_DATE	10/16/2018			10/16/2018			10/16/2018			10/16/2018		
MEDIA: WATER	QC_TYPE	FB			FB			FB			FB		
	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)		6.2	U		6.1	U		6	U		5.9	U	
PERFLUOROBUTANESULFONIC ACID (PFBS)		2.1	U		2	U		2	U		2	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		3.1	U		3	U		3	U		2.9	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2.1	U		2	U		2	U		2	U	
PERFLUORONONANOIC ACID (PFNA)		1	U		1	U		0.99	U		0.98	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2.1	U		2	U		2	U		2	U	

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-101618-FRB-4852			WGNA-101618-RW-0404			WGNA-101618-RW-0755			WGNA-101618-RW-3073		
SDG: 320-44272-1	LAB_ID	320-44272-4			320-44272-7			320-44272-9			320-44272-11		
FRACTION: PFAS	SAMP_DATE	10/16/2018			10/16/2018			10/16/2018			10/16/2018		
MEDIA: WATER	QC_TYPE	FB			NM			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)		5.8	U		19			20			11		
PERFLUOROBUTANESULFONIC ACID (PFBS)		1.9	U		6.3			5.9			81		
PERFLUOROHEPTANOIC ACID (PFHPA)		2.9	U		6.5			5.1			7.1		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		1.9	U		7			32	J	D	15		
PERFLUORONONANOIC ACID (PFNA)		0.96	U		3.2	J	P	1.6	J	P	2.5	J	P
PERFLUOROOCTANESULFONIC ACID (PFOS)		1.9	U		24			27	J	D	31		

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-101618-RW-3124			WGNA-101618-RW-3178			WGNA-101618-RW-3193			WGNA-101618-RW-3220		
SDG: 320-44272-1	LAB_ID	320-44272-5			320-44272-13			320-44272-19			320-44272-17		
FRACTION: PFAS	SAMP_DATE	10/16/2018			10/16/2018			10/16/2018			10/16/2018		
MEDIA: WATER	QC_TYPE	NM			NM			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)		17			10			34			13		
PERFLUOROBUTANESULFONIC ACID (PFBS)		5.7			5.5			13			96		
PERFLUOROHEPTANOIC ACID (PFHPA)		4.2	J	P	3	J	P	18			7.2		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		9.4			7.2			19			16		
PERFLUORONONANOIC ACID (PFNA)		1.7	J	P	1.5	J	P	1.9	J	P	2.5	J	P
PERFLUOROOCTANESULFONIC ACID (PFOS)		14			17			11			34		

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-101618-RW-4852		
SDG: 320-44272-1	LAB_ID	320-44272-3		
FRACTION: PFAS	SAMP_DATE	10/16/2018		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		9		
PERFLUOROBUTANESULFONIC ACID (PFBS)		7.6		
PERFLUOROHEPTANOIC ACID (PFHPA)		4.6	J	P
PERFLUOROHEXANESULFONIC ACID (PFHXS)		3.7	J	P
PERFLUORONONANOIC ACID (PFNA)		2.1	J	P
PERFLUOROOCTANESULFONIC ACID (PFOS)		9.9		

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: NAWC-101618-RW-275 | Lab Sample ID: 320-44272-1

Matrix: Water | Lab File ID: 2018.10.28_537A_009.d

Analysis Method: 537 | Date Collected: 10/16/2018 08:10

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 248.2(mL) | Date Analyzed: 10/28/2018 17:57

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	25		5.0	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	15	M	7.1	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.2	J	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.0		5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.5		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	12		5.0	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	103		70-130

Toni L Salerno
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: NAWC-101618-FRB-275 | Lab Sample ID: 320-44272-2

Matrix: Water | Lab File ID: 2018.10.28_537A_010.d

Analysis Method: 537 | Date Collected: 10/16/2018 08:05

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 243.3(mL) | Date Analyzed: 10/28/2018 18:04

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.1	U	5.1	2.1	0.98
335-67-1	Perfluorooctanoic acid (PFOA)	6.2	U	7.2	6.2	2.8
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.1	U	5.1	2.1	0.66
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.1	U	5.1	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.1	U	5.1	2.1	0.82

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	107		70-130

11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-4852 | Lab Sample ID: 320-44272-3

Matrix: Water | Lab File ID: 2018.10.28_537A_011.d

Analysis Method: 537 | Date Collected: 10/16/2018 09:10

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 254.7(mL) | Date Analyzed: 10/28/2018 18:12

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.9	~~M~~	4.9	2.0	0.93
335-67-1	Perfluorooctanoic acid (PFOA)	9.0	~~M~~	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.1	J	4.9	0.98	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.7	J	4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6	J ~~M~~	4.9	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.6		4.9	2.0	0.79

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

11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-4852 | Lab Sample ID: 320-44272-4

Matrix: Water | Lab File ID: 2018.10.28_537A_012.d

Analysis Method: 537 | Date Collected: 10/16/2018 09:05

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 259.9(mL) | Date Analyzed: 10/28/2018 18:19

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.9	U	4.8	1.9	0.91
335-67-1	Perfluorooctanoic acid (PFOA)	5.8	U	6.7	5.8	2.6
375-95-1	Perfluorononanoic acid (PFNA)	0.96	U	4.8	0.96	0.45
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	4.8	1.9	0.62
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.9	U	4.8	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	4.8	1.9	0.77

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

Toni L Salomon
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3124 | Lab Sample ID: 320-44272-5

Matrix: Water | Lab File ID: 2018.10.28_537A_013.d

Analysis Method: 537 | Date Collected: 10/16/2018 09:40

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 249.2(mL) | Date Analyzed: 10/28/2018 18:26

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14		5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	17	~~M~~	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.7	J ~~M~~	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.4		5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.2	J	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.7		5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	94		70-130

Dawn L Salerno
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3124 | Lab Sample ID: 320-44272-6

Matrix: Water | Lab File ID: 2018.10.28_537A_014.d

Analysis Method: 537 | Date Collected: 10/16/2018 09:35

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 242.7(mL) | Date Analyzed: 10/28/2018 18:34

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.1	U	5.2	2.1	0.98
335-67-1	Perfluorooctanoic acid (PFOA)	6.2	U	7.2	6.2	2.8
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.2	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.1	U	5.2	2.1	0.66
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.1	U	5.2	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.1	U	5.2	2.1	0.82

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	96		70-130

Toni L Salomon
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-0404 | Lab Sample ID: 320-44272-7

Matrix: Water | Lab File ID: 2018.10.28_537A_015.d

Analysis Method: 537 | Date Collected: 10/16/2018 10:10

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 252.9(mL) | Date Analyzed: 10/28/2018 18:41

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24		4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	19	~~M~~	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.2	J	4.9	0.99	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.0		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.5		4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	6.3		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	98		70-130

Dawn L Salerno
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-0404 | Lab Sample ID: 320-44272-8

Matrix: Water | Lab File ID: 2018.10.28_537A_016.d

Analysis Method: 537 | Date Collected: 10/16/2018 10:05

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 253.9(mL) | Date Analyzed: 10/28/2018 18:49

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	5.9	U	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	4.9	0.98	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	103		70-130

Terri L Salemme
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-0755 | Lab Sample ID: 320-44272-9

Matrix: Water | Lab File ID: 2018.10.28_537A_019.d

Analysis Method: 537 | Date Collected: 10/16/2018 10:40

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 250.2(mL) | Date Analyzed: 10/28/2018 19:11

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	27	J	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	20	~~M~~	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.6	J ~~M~~	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	32	~~M~~ J	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.1		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.9		5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	96		70-130

11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-0755 | Lab Sample ID: 320-44272-10

Matrix: Water | Lab File ID: 2018.10.31_537A_030.d

Analysis Method: 537 | Date Collected: 10/16/2018 10:35

Extraction Method: 537 | Date Extracted: 10/30/2018 11:16

Sample wt/vol: 273.1(mL) | Date Analyzed: 10/31/2018 13:43

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.: 256102 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.8	U	4.6	1.8	0.87
335-67-1	Perfluorooctanoic acid (PFOA)	5.5	U	6.4	5.5	2.5
375-95-1	Perfluorononanoic acid (PFNA)	0.92	U	4.6	0.92	0.43
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	4.6	1.8	0.59
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.7	U	4.6	2.7	1.2
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	4.6	1.8	0.73

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	94		70-130

Dani L Saleman
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3073 | Lab Sample ID: 320-44272-11

Matrix: Water | Lab File ID: 2018.10.28_537A_023.d

Analysis Method: 537 | Date Collected: 10/16/2018 11:10

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 240.7(mL) | Date Analyzed: 10/28/2018 19:40

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	31		5.2	2.1	0.99
335-67-1	Perfluorooctanoic acid (PFOA)	11		7.3	6.2	2.8
375-95-1	Perfluorononanoic acid (PFNA)	2.5	J ~~M~~	5.2	1.0	0.49
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15		5.2	2.1	0.66
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.1		5.2	3.1	1.4
375-73-5	Perfluorobutanesulfonic acid (PFBS)	81		5.2	2.1	0.83

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	105		70-130

11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3073 | Lab Sample ID: 320-44272-12

Matrix: Water | Lab File ID: 2018.10.28_537A_024.d

Analysis Method: 537 | Date Collected: 10/16/2018 11:05

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 251.8(mL) | Date Analyzed: 10/28/2018 19:48

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	6.9	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	5.0	0.99	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	102		70-130

Dawn L Salerno
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3178 | Lab Sample ID: 320-44272-13

Matrix: Water | Lab File ID: 2018.10.28_537A_025.d

Analysis Method: 537 | Date Collected: 10/16/2018 11:40

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 252.7(mL) | Date Analyzed: 10/28/2018 19:55

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17		4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	10	~~M~~	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.5	J ~~M~~	4.9	0.99	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.2		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	J	4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.5		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	97		70-130

Toni L Salomon
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3178 | Lab Sample ID: 320-44272-14

Matrix: Water | Lab File ID: 2018.10.28_537A_026.d

Analysis Method: 537 | Date Collected: 10/16/2018 11:35

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 246.3(mL) | Date Analyzed: 10/28/2018 20:02

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.1	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	U	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.1	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.1	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	99		70-130

11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: NAWC-101618-RW-194 | Lab Sample ID: 320-44272-15

Matrix: Water | Lab File ID: 2018.10.28_537A_027.d

Analysis Method: 537 | Date Collected: 10/16/2018 12:10

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 248.7(mL) | Date Analyzed: 10/28/2018 20:10

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	36		5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	21	M	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	4.4	J	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	4.5	J	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.5		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.8	J	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	107		70-130
STL00996	13C2 PFDA	96		70-130

Toni L Salerno
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: NAWC-101618-FRB-194 | Lab Sample ID: 320-44272-16

Matrix: Water | Lab File ID: 2018.10.28_537A_028.d

Analysis Method: 537 | Date Collected: 10/16/2018 12:05

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 256.9(mL) | Date Analyzed: 10/28/2018 20:17

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.9	U	4.9	1.9	0.92
335-67-1	Perfluorooctanoic acid (PFOA)	5.8	U	6.8	5.8	2.6
375-95-1	Perfluorononanoic acid (PFNA)	0.97	U	4.9	0.97	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	4.9	1.9	0.62
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.9	U	4.9	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	4.9	1.9	0.78

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	99		70-130

Toni L Salomon
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3220 | Lab Sample ID: 320-44272-17

Matrix: Water | Lab File ID: 2018.10.28_537A_031.d

Analysis Method: 537 | Date Collected: 10/16/2018 13:10

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 253.5(mL) | Date Analyzed: 10/28/2018 20:39

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	34		4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	13		6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.5	J	4.9	0.99	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	16		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.2		4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	96		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	92		70-130

11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3220 | Lab Sample ID: 320-44272-18

Matrix: Water | Lab File ID: 2018.10.28_537A_032.d

Analysis Method: 537 | Date Collected: 10/16/2018 13:05

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 254.6(mL) | Date Analyzed: 10/28/2018 20:46

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.9	2.0	0.93
335-67-1	Perfluorooctanoic acid (PFOA)	5.9	U	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	4.9	0.98	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.9	U	4.9	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	99		70-130

Toni L Salerno
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3193 | Lab Sample ID: 320-44272-19

Matrix: Water | Lab File ID: 2018.10.28_537A_033.d

Analysis Method: 537 | Date Collected: 10/16/2018 13:40

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 248.2(mL) | Date Analyzed: 10/28/2018 20:54

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11		5.0	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	34	~~M~~	7.1	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.9	J	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	19	~~M~~	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	18		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	13		5.0	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	100		70-130

Toni L Salomon
11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3193 | Lab Sample ID: 320-44272-20

Matrix: Water | Lab File ID: 2018.10.28_537A_034.d

Analysis Method: 537 | Date Collected: 10/16/2018 13:35

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 251.8(mL) | Date Analyzed: 10/28/2018 21:01

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	6.9	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	5.0	0.99	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	96		70-130

11/09/2018

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-DUP-48 | Lab Sample ID: 320-44272-21

Matrix: Water | Lab File ID: 2018.10.28_537A_039.d

Analysis Method: 537 | Date Collected: 10/16/2018 07:00

Extraction Method: 537 | Date Extracted: 10/27/2018 06:19

Sample wt/vol: 253.5(mL) | Date Analyzed: 10/28/2018 21:38

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	22		4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	20	~~M~~	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.4	J	4.9	0.99	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.9		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.2		4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	6.2		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	97		70-130

11/09/2018

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: NAWC-101618-RW-275 | Lab Sample ID: 320-44272-1

Matrix: Water | Lab File ID: 2018.10.28_537A_009.d

Analysis Method: 537 | Date Collected: 10/16/2018 08:10

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 248.2(mL) | Date Analyzed: 10/28/2018 17:57

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	25		5.0	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	15	M	7.1	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.2	J	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.0		5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.5		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	12		5.0	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: NAWC-101618-FRB-275 | Lab Sample ID: 320-44272-2

Matrix: Water | Lab File ID: 2018.10.28_537A_010.d

Analysis Method: 537 | Date Collected: 10/16/2018 08:05

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 243.3(mL) | Date Analyzed: 10/28/2018 18:04

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.1	U	5.1	2.1	0.98
335-67-1	Perfluorooctanoic acid (PFOA)	6.2	U	7.2	6.2	2.8
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.1	U	5.1	2.1	0.66
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.1	U	5.1	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.1	U	5.1	2.1	0.82

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	107		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-4852 Lab Sample ID: 320-44272-3

Matrix: Water Lab File ID: 2018.10.28_537A_011.d

Analysis Method: 537 Date Collected: 10/16/2018 09:10

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 254.7(mL) Date Analyzed: 10/28/2018 18:12

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.: 255426 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	9.9	M	4.9	2.0	0.93
335-67-1	Perfluorooctanoic acid (PFOA)	9.0	M	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.1	J	4.9	0.98	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.7	J	4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.6	J M	4.9	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.6		4.9	2.0	0.79

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

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-4852 Lab Sample ID: 320-44272-4

Matrix: Water Lab File ID: 2018.10.28_537A_012.d

Analysis Method: 537 Date Collected: 10/16/2018 09:05

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 259.9(mL) Date Analyzed: 10/28/2018 18:19

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.: 255426 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.9	U	4.8	1.9	0.91
335-67-1	Perfluorooctanoic acid (PFOA)	5.8	U	6.7	5.8	2.6
375-95-1	Perfluorononanoic acid (PFNA)	0.96	U	4.8	0.96	0.45
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	4.8	1.9	0.62
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.9	U	4.8	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	4.8	1.9	0.77

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

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3124 Lab Sample ID: 320-44272-5

Matrix: Water Lab File ID: 2018.10.28_537A_013.d

Analysis Method: 537 Date Collected: 10/16/2018 09:40

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 249.2(mL) Date Analyzed: 10/28/2018 18:26

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.: 255426 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14		5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	17	M	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.7	J M	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	9.4		5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.2	J	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.7		5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	94		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3124 Lab Sample ID: 320-44272-6

Matrix: Water Lab File ID: 2018.10.28_537A_014.d

Analysis Method: 537 Date Collected: 10/16/2018 09:35

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 242.7(mL) Date Analyzed: 10/28/2018 18:34

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.: 255426 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.1	U	5.2	2.1	0.98
335-67-1	Perfluorooctanoic acid (PFOA)	6.2	U	7.2	6.2	2.8
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.2	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.1	U	5.2	2.1	0.66
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.1	U	5.2	3.1	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.1	U	5.2	2.1	0.82

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	96		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-0404 | Lab Sample ID: 320-44272-7

Matrix: Water | Lab File ID: 2018.10.28_537A_015.d

Analysis Method: 537 | Date Collected: 10/16/2018 10:10

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 252.9(mL) | Date Analyzed: 10/28/2018 18:41

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24		4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	19	M	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.2	J	4.9	0.99	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.0		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.5		4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	6.3		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	98		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-0404 Lab Sample ID: 320-44272-8

Matrix: Water Lab File ID: 2018.10.28_537A_016.d

Analysis Method: 537 Date Collected: 10/16/2018 10:05

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 253.9(mL) Date Analyzed: 10/28/2018 18:49

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.: 255426 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	5.9	U	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	4.9	0.98	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	103		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-0755 Lab Sample ID: 320-44272-9

Matrix: Water Lab File ID: 2018.10.28_537A_019.d

Analysis Method: 537 Date Collected: 10/16/2018 10:40

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 250.2(mL) Date Analyzed: 10/28/2018 19:11

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.: 255428 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	27		5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	20	M	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.6	J M	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	32	M	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.1		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.9		5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	96		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-0755 | Lab Sample ID: 320-44272-10

Matrix: Water | Lab File ID: 2018.10.31_537A_030.d

Analysis Method: 537 | Date Collected: 10/16/2018 10:35

Extraction Method: 537 | Date Extracted: 10/30/2018 11:16

Sample wt/vol: 273.1(mL) | Date Analyzed: 10/31/2018 13:43

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.: 256102 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.8	U	4.6	1.8	0.87
335-67-1	Perfluorooctanoic acid (PFOA)	5.5	U	6.4	5.5	2.5
375-95-1	Perfluorononanoic acid (PFNA)	0.92	U	4.6	0.92	0.43
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.8	U	4.6	1.8	0.59
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.7	U	4.6	2.7	1.2
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.8	U	4.6	1.8	0.73

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	94		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3073 Lab Sample ID: 320-44272-11

Matrix: Water Lab File ID: 2018.10.28_537A_023.d

Analysis Method: 537 Date Collected: 10/16/2018 11:10

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 240.7(mL) Date Analyzed: 10/28/2018 19:40

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.: 255428 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	31		5.2	2.1	0.99
335-67-1	Perfluorooctanoic acid (PFOA)	11		7.3	6.2	2.8
375-95-1	Perfluorononanoic acid (PFNA)	2.5	J M	5.2	1.0	0.49
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15		5.2	2.1	0.66
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.1		5.2	3.1	1.4
375-73-5	Perfluorobutanesulfonic acid (PFBS)	81		5.2	2.1	0.83

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3073 Lab Sample ID: 320-44272-12

Matrix: Water Lab File ID: 2018.10.28_537A_024.d

Analysis Method: 537 Date Collected: 10/16/2018 11:05

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 251.8(mL) Date Analyzed: 10/28/2018 19:48

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.: 255428 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	6.9	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	5.0	0.99	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	106		70-130
STL00996	13C2 PFDA	102		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3178 Lab Sample ID: 320-44272-13

Matrix: Water Lab File ID: 2018.10.28_537A_025.d

Analysis Method: 537 Date Collected: 10/16/2018 11:40

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 252.7(mL) Date Analyzed: 10/28/2018 19:55

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.: 255428 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	17		4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	10	M	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.5	J M	4.9	0.99	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.2		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	J	4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.5		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	97		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3178 | Lab Sample ID: 320-44272-14

Matrix: Water | Lab File ID: 2018.10.28_537A_026.d

Analysis Method: 537 | Date Collected: 10/16/2018 11:35

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 246.3(mL) | Date Analyzed: 10/28/2018 20:02

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.1	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	6.1	U	7.1	6.1	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.1	1.0	0.48
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.1	2.0	0.65
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.1	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.1	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: NAWC-101618-RW-194 | Lab Sample ID: 320-44272-15

Matrix: Water | Lab File ID: 2018.10.28_537A_027.d

Analysis Method: 537 | Date Collected: 10/16/2018 12:10

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 248.7(mL) | Date Analyzed: 10/28/2018 20:10

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	36		5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	21	M	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	4.4	J	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	4.5	J	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.5		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.8	J	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	107		70-130
STL00996	13C2 PFDA	96		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: NAWC-101618-FRB-194 | Lab Sample ID: 320-44272-16

Matrix: Water | Lab File ID: 2018.10.28_537A_028.d

Analysis Method: 537 | Date Collected: 10/16/2018 12:05

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 256.9(mL) | Date Analyzed: 10/28/2018 20:17

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.: 255428 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.9	U	4.9	1.9	0.92
335-67-1	Perfluorooctanoic acid (PFOA)	5.8	U	6.8	5.8	2.6
375-95-1	Perfluorononanoic acid (PFNA)	0.97	U	4.9	0.97	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	4.9	1.9	0.62
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.9	U	4.9	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	4.9	1.9	0.78

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3220 Lab Sample ID: 320-44272-17

Matrix: Water Lab File ID: 2018.10.28_537A_031.d

Analysis Method: 537 Date Collected: 10/16/2018 13:10

Extraction Method: 537 Date Extracted: 10/27/2018 06:13

Sample wt/vol: 253.5(mL) Date Analyzed: 10/28/2018 20:39

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.: 255429 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	34		4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	13		6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	2.5	J	4.9	0.99	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	16		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.2		4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	96		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	95		70-130
STL00996	13C2 PFDA	92		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3220 | Lab Sample ID: 320-44272-18

Matrix: Water | Lab File ID: 2018.10.28_537A_032.d

Analysis Method: 537 | Date Collected: 10/16/2018 13:05

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 254.6(mL) | Date Analyzed: 10/28/2018 20:46

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.9	2.0	0.93
335-67-1	Perfluorooctanoic acid (PFOA)	5.9	U	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	4.9	0.98	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.9	U	4.9	2.9	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-RW-3193 | Lab Sample ID: 320-44272-19

Matrix: Water | Lab File ID: 2018.10.28_537A_033.d

Analysis Method: 537 | Date Collected: 10/16/2018 13:40

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 248.2(mL) | Date Analyzed: 10/28/2018 20:54

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11		5.0	2.0	0.96
335-67-1	Perfluorooctanoic acid (PFOA)	34	M	7.1	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.9	J	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	19	M	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	18		5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	13		5.0	2.0	0.81

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	100		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-FRB-3193 | Lab Sample ID: 320-44272-20

Matrix: Water | Lab File ID: 2018.10.28_537A_034.d

Analysis Method: 537 | Date Collected: 10/16/2018 13:35

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 251.8(mL) | Date Analyzed: 10/28/2018 21:01

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	6.9	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	5.0	0.99	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	96		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: WGNA-101618-DUP-48 | Lab Sample ID: 320-44272-21

Matrix: Water | Lab File ID: 2018.10.28_537A_039.d

Analysis Method: 537 | Date Collected: 10/16/2018 07:00

Extraction Method: 537 | Date Extracted: 10/27/2018 06:19

Sample wt/vol: 253.5(mL) | Date Analyzed: 10/28/2018 21:38

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	22		4.9	2.0	0.94
335-67-1	Perfluorooctanoic acid (PFOA)	20	M	6.9	5.9	2.7
375-95-1	Perfluorononanoic acid (PFNA)	3.4	J	4.9	0.99	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.9		4.9	2.0	0.63
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.2		4.9	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	6.2		4.9	2.0	0.79

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	97		70-130

Appendix C

Support Documentation

ANALYTE	ORIGINAL 101618-RW-0404	DUPLICATE DUP-48	RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
Perfluorooctanoic acid (PFOA)	19	20	6.9	5.13	FALSE	TRUE	TRUE	FALSE
Perfluorobutanesulfonic acid (PFBS)	6.3	6.2	4.9	1.60	FALSE	FALSE	FALSE	FALSE
Perfluoroheptanoic acid (PFHpA)	6.5	7.2	4.9	10.22	FALSE	FALSE	FALSE	FALSE
Perfluorohexanesulfonic acid (PFHxS)	7	6.9	4.9	1.44	FALSE	FALSE	FALSE	FALSE
Perfluorononanoic acid (PFNA)	3.2	3.4	4.9	6.06	FALSE	FALSE	FALSE	FALSE
Perfluorooctanesulfonic acid (PFOS)	24	22	4.9	8.70	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: 10/16/2018	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			Sampler: Mary Kay Bond
King of Prussia, PA 19406	☐CALENDAR DAYS ☐WORKING DAYS			For Lab Use Only:
610-382-2924	TAT if different from Below 21			Walk-in Client:
610-491-9688	☑ 2 weeks			Lab Sampling:
Project Name: WE04	☐ 1 week			
Site: WE04	☐ 2 days			Job / SDG No.:
P O # 1132358 (through EarthToxics)	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 537 UCMR3	Sample Specific Notes:
NAWC-101618-RW-275	10/16/2018	08:10	G	DW	2	N	N	Y	
NAWC-101618-FRB-275	10/16/2018	08:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101618-RW-4852	10/16/2018	09:10	G	DW	2	N	N	Y	
WGNA-101618-FRB-4852	10/16/2018	09:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101618-RW-3124	10/16/2018	9:40	G	DW	2	N	N	Y	
WGNA-101618-FRB-3124	10/16/2018	9:35	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101618-RW-0404	10/16/2018	10:10	G	DW	2	N	N	Y	
WGNA-101618-FRB-0404	10/16/2018	10:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101618-RW-0755	10/16/2018	10:40	G	DW	6	N	Y	Y	MS/MSD
WGNA-101618-FRB-0755	10/16/2018	10:35	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101618-RW-3073	10/16/2018	11:10	G	DW	2	N	N	Y	
WGNA-101618-FRB-3073	10/16/2018	11:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101618-RW-3178	10/16/2018	11:40	G	DW	2	N	N	Y	
WGNA-101618-FRB-3178	10/16/2018	11:35	G	DW	2	N	N	Y	Field Reagent Blank
NAWC-101618-RW-194	10/16/2018	12:10	G	DW	2	N	N	Y	
NAWC-101618-FRB-194	10/16/2018	12:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101618-RW-3220	10/16/2018	13:10	G	DW	2	N	N	Y	
WGNA-101618-FRB-3220	10/16/2018	13:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101618-RW-3193	10/16/2018	13:40	G	DW	2	N	N	Y	
① WGNA-101618-FRB-3193	10/16/2018	13:35	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101618-DUP-48	10/16/2018	07:00	G	DW	2	N	N	Y	Duplicate
① Sample Time was 13:40 BK 10/17/18									

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma — 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.
☑Non-Hazard ☐Flammable ☐Skin Irritant ☐Poison B ☐Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐Return to Client ☑Disposal by Lab ☐Archive for_____ Months

Fed Ex Tracking: **7734 8906 3792**

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 0.9 3.3 Corr'd: 0.9 3.3 | Therm ID No.: A163

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Mary Kay Bond	Tetra Tech	10/16/2018 16:00		TAS	10/17/18 925
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-44272-1

Login Number: 44272
List Number: 1
Creator: Gooch, Mayce

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	094137, seal
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Narrative
320-44272-1

Receipt
The samples were received on 10/17/2018 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.9º C and 3.3º C.

Receipt Exceptions
The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): WGNA-101618-FRB-3193 (320-44272-20). The container labels lists sampling time as1340, while COC list 1335. Labeled according to COC.
The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): WGNA-101618-FRB-3124 (320-44272-6). The container labels list WGNA-101618-FRB-2018, while coc list WGNA-101618-FRB-2018. Labeled according to COC.

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.

Method(s) 537: The concentrations of Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), and Perfluorohexanesulfonic acid (PFHxS) in the parent sample were greater than 4 times the matrix spike / matrix spike duplicate (MS/MSD) concentration for preparation batch 320-255321 and analytical batch 320-255428; therefore, the MS/MSD could not be evaluated for accuracy and precision for these analytes. The associated laboratory control sample (LCS) met acceptance criteria.

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

Organic Prep
Method(s) 537: The following sample: WGNA-101618-RW-3178 (320-44272-13) in preparation batch 320-255321 was observed to be a yellow color prior to extraction.

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 320-255322.

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-255789.

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

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.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	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. TestAmerica Job ID: 320-44272-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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

Sample Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-44272-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-44272-1	NAWC-101618-RW-275	Water	10/16/18 08:10	10/17/18 09:25
320-44272-2	NAWC-101618-FRB-275	Water	10/16/18 08:05	10/17/18 09:25
320-44272-3	WGNA-101618-RW-4852	Water	10/16/18 09:10	10/17/18 09:25
320-44272-4	WGNA-101618-FRB-4852	Water	10/16/18 09:05	10/17/18 09:25
320-44272-5	WGNA-101618-RW-3124	Water	10/16/18 09:40	10/17/18 09:25
320-44272-6	WGNA-101618-FRB-3124	Water	10/16/18 09:35	10/17/18 09:25
320-44272-7	WGNA-101618-RW-0404	Water	10/16/18 10:10	10/17/18 09:25
320-44272-8	WGNA-101618-FRB-0404	Water	10/16/18 10:05	10/17/18 09:25
320-44272-9	WGNA-101618-RW-0755	Water	10/16/18 10:40	10/17/18 09:25
320-44272-10	WGNA-101618-FRB-0755	Water	10/16/18 10:35	10/17/18 09:25
320-44272-11	WGNA-101618-RW-3073	Water	10/16/18 11:10	10/17/18 09:25
320-44272-12	WGNA-101618-FRB-3073	Water	10/16/18 11:05	10/17/18 09:25
320-44272-13	WGNA-101618-RW-3178	Water	10/16/18 11:40	10/17/18 09:25
320-44272-14	WGNA-101618-FRB-3178	Water	10/16/18 11:35	10/17/18 09:25
320-44272-15	NAWC-101618-RW-194	Water	10/16/18 12:10	10/17/18 09:25
320-44272-16	NAWC-101618-FRB-194	Water	10/16/18 12:05	10/17/18 09:25
320-44272-17	WGNA-101618-RW-3220	Water	10/16/18 13:10	10/17/18 09:25
320-44272-18	WGNA-101618-FRB-3220	Water	10/16/18 13:05	10/17/18 09:25
320-44272-19	WGNA-101618-RW-3193	Water	10/16/18 13:40	10/17/18 09:25
320-44272-20	WGNA-101618-FRB-3193	Water	10/16/18 13:35	10/17/18 09:25
320-44272-21	WGNA-101618-DUP-48	Water	10/16/18 07:00	10/17/18 09:25

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-101618-RW-275	320-44272-1	102	103
NAWC-101618-FRB-275	320-44272-2	100	107
WGNA-101618-RW-4852	320-44272-3	99	99
WGNA-101618-FRB-4852	320-44272-4	102	102
WGNA-101618-RW-3124	320-44272-5	102	94
WGNA-101618-FRB-3124	320-44272-6	100	96
WGNA-101618-RW-0404	320-44272-7	97	98
WGNA-101618-FRB-0404	320-44272-8	105	103
WGNA-101618-RW-0755	320-44272-9	98	96
WGNA-101618-FRB-0755	320-44272-10	97	94
WGNA-101618-RW-3073	320-44272-11	106	105
WGNA-101618-FRB-3073	320-44272-12	106	102
WGNA-101618-RW-3178	320-44272-13	100	97
WGNA-101618-FRB-3178	320-44272-14	102	99
NAWC-101618-RW-194	320-44272-15	107	96
NAWC-101618-FRB-194	320-44272-16	97	99
WGNA-101618-RW-3220	320-44272-17	95	92
WGNA-101618-FRB-3220	320-44272-18	101	99
WGNA-101618-RW-3193	320-44272-19	100	100
WGNA-101618-FRB-3193	320-44272-20	102	96
WGNA-101618-DUP-48	320-44272-21	99	97
	MB 320-255321/1-A	100	99
	MB 320-255322/1-A	97	101
	MB 320-255789/1-A	97	96
	LCS 320-255322/2-A	100	100

	QC LIMITS
PFHxA = 13C2 PFHxA	70-130
PFDA = 13C2 PFDA	70-130

Column to be used to flag recovery values

FORM II 537

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
	LCS 320-255789/2-A	93	93
	LCSD 320-255322/3-A	97	94
	LCSD 320-255789/3-A	96	93
	LLCS 320-255321/2-A	97	95
WGNA-101618-RW-075 5 LMS	320-44272-9 LMS	99	98
WGNA-101618-RW-075 5 LMSD	320-44272-9 LMSD	99	100

	QC LIMITS
PFHxA = 13C2 PFHxA	70-130
PFDA = 13C2 PFDA	70-130

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.10.28_537A_037.d

Lab ID: LCS 320-255322/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	186	177	95	70-130	
Perfluorooctanoic acid (PFOA)	200	198	99	70-130	
Perfluorononanoic acid (PFNA)	200	199	99	70-130	
Perfluorohexanesulfonic acid (PFHxS)	182	190	104	70-130	
Perfluoroheptanoic acid (PFHpA)	200	206	103	70-130	
Perfluorobutanesulfonic acid (PFBS)	177	194	110	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.10.31_537A_028.d

Lab ID: LCS 320-255789/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	186	182	98	70-130	
Perfluorooctanoic acid (PFOA)	200	177	89	70-130	
Perfluorononanoic acid (PFNA)	200	188	94	70-130	
Perfluorohexanesulfonic acid (PFHxS)	182	194	107	70-130	
Perfluoroheptanoic acid (PFHpA)	200	196	98	70-130	
Perfluorobutanesulfonic acid (PFBS)	177	165	93	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.10.28_537A_038.d

Lab ID: LCSD 320-255322/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	186	179	97	2	30	70-130	
Perfluorooctanoic acid (PFOA)	200	190	95	4	30	70-130	
Perfluorononanoic acid (PFNA)	200	202	101	1	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	182	193	106	1	30	70-130	
Perfluoroheptanoic acid (PFHpA)	200	193	96	7	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	177	194	110	0	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.10.31_537A_029.d

Lab ID: LCSD 320-255789/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	186	172	93	6	30	70-130	
Perfluorooctanoic acid (PFOA)	200	181	91	2	30	70-130	
Perfluorononanoic acid (PFNA)	200	194	97	3	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	182	177	97	9	30	70-130	
Perfluoroheptanoic acid (PFHpA)	200	196	98	0	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	177	172	97	4	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.10.28_537A_008.d

Lab ID: LLCS 320-255321/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	3.71	3.74 J	101	50-150	
Perfluorooctanoic acid (PFOA)	4.00	3.80 J	95	50-150	
Perfluorononanoic acid (PFNA)	4.00	3.71 J	93	50-150	
Perfluorohexanesulfonic acid (PFHxS)	3.64	3.90 J	107	50-150	
Perfluoroheptanoic acid (PFHpA)	4.00	3.91 J	98	50-150	
Perfluorobutanesulfonic acid (PFBS)	3.54	3.96 J	112	50-150	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LOW LEVEL MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.10.28_537A_020.d

Lab ID: 320-44272-9 LMS Client ID: WGNA-101618-RW-0755 LMS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	LMS CONCENTRATION (ng/L)	LMS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	3.58	27	27.9	36	50-150	4
Perfluorooctanoic acid (PFOA)	3.86	20	23.8	109	50-150	M 4
Perfluorononanoic acid (PFNA)	3.85	1.6 J	4.91	87	50-150	
Perfluorohexanesulfonic acid (PFHxS)	3.51	32	34.5	65	50-150	4
Perfluoroheptanoic acid (PFHpA)	3.85	5.1	8.99	100	50-150	
Perfluorobutanesulfonic acid (PFBS)	3.41	5.9	9.19	97	50-150	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LOW LEVEL MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.10.28_537A_021.d

Lab ID: 320-44272-9 LMSD Client ID: WGNA-101618-RW-0755 LMSD

COMPOUND	SPIKE ADDED (ng/L)	LMSD CONCENTRATION (ng/L)	LMSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	3.63	30.3	104	9	50	50-150	4
Perfluorooctanoic acid (PFOA)	3.92	25.2	144	6	50	50-150	M 4
Perfluorononanoic acid (PFNA)	3.92	5.45	99	10	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	3.56	37.9	161	9	50	50-150	4
Perfluoroheptanoic acid (PFHpA)	3.92	8.38	83	7	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	3.46	9.76	112	6	50	50-150	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab File ID: 2018.10.28_537A_007.d Lab Sample ID: MB 320-255321/1-A

Matrix: Water Date Extracted: 10/27/2018 06:13

Instrument ID: A8_N Date Analyzed: 10/28/2018 17:42

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-255321/2-A	2018.10.28_537A_008.d	10/28/2018 17:50
NAWC-101618-RW-275	320-44272-1	2018.10.28_537A_009.d	10/28/2018 17:57
NAWC-101618-FRB-275	320-44272-2	2018.10.28_537A_010.d	10/28/2018 18:04
WGNA-101618-RW-4852	320-44272-3	2018.10.28_537A_011.d	10/28/2018 18:12
WGNA-101618-FRB-4852	320-44272-4	2018.10.28_537A_012.d	10/28/2018 18:19
WGNA-101618-RW-3124	320-44272-5	2018.10.28_537A_013.d	10/28/2018 18:26
WGNA-101618-FRB-3124	320-44272-6	2018.10.28_537A_014.d	10/28/2018 18:34
WGNA-101618-RW-0404	320-44272-7	2018.10.28_537A_015.d	10/28/2018 18:41
WGNA-101618-FRB-0404	320-44272-8	2018.10.28_537A_016.d	10/28/2018 18:49
WGNA-101618-RW-0755	320-44272-9	2018.10.28_537A_019.d	10/28/2018 19:11
WGNA-101618-RW-0755 LMS	320-44272-9 LMS	2018.10.28_537A_020.d	10/28/2018 19:18
WGNA-101618-RW-0755 LMSD	320-44272-9 LMSD	2018.10.28_537A_021.d	10/28/2018 19:25
WGNA-101618-RW-3073	320-44272-11	2018.10.28_537A_023.d	10/28/2018 19:40
WGNA-101618-FRB-3073	320-44272-12	2018.10.28_537A_024.d	10/28/2018 19:48
WGNA-101618-RW-3178	320-44272-13	2018.10.28_537A_025.d	10/28/2018 19:55
WGNA-101618-FRB-3178	320-44272-14	2018.10.28_537A_026.d	10/28/2018 20:02
NAWC-101618-RW-194	320-44272-15	2018.10.28_537A_027.d	10/28/2018 20:10
NAWC-101618-FRB-194	320-44272-16	2018.10.28_537A_028.d	10/28/2018 20:17
WGNA-101618-RW-3220	320-44272-17	2018.10.28_537A_031.d	10/28/2018 20:39
WGNA-101618-FRB-3220	320-44272-18	2018.10.28_537A_032.d	10/28/2018 20:46
WGNA-101618-RW-3193	320-44272-19	2018.10.28_537A_033.d	10/28/2018 20:54
WGNA-101618-FRB-3193	320-44272-20	2018.10.28_537A_034.d	10/28/2018 21:01

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-255321/1-A

Matrix: Water | Lab File ID: 2018.10.28_537A_007.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 10/27/2018 06:13

Sample wt/vol: 250.00(mL) | Date Analyzed: 10/28/2018 17:42

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.: 255426 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	99		70-130

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab File ID: 2018.10.28_537A_036.d Lab Sample ID: MB 320-255322/1-A

Matrix: Water Date Extracted: 10/27/2018 06:19

Instrument ID: A8_N Date Analyzed: 10/28/2018 21:16

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-255322/2-A	2018.10.28_537A_037.d	10/28/2018 21:23
	LCSD 320-255322/3-A	2018.10.28_537A_038.d	10/28/2018 21:30
WGNA-101618-DUP-48	320-44272-21	2018.10.28_537A_039.d	10/28/2018 21:38

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-255322/1-A

Matrix: Water | Lab File ID: 2018.10.28_537A_036.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 10/27/2018 06:19

Sample wt/vol: 250.00(mL) | Date Analyzed: 10/28/2018 21:16

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.: 255429 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	101		70-130

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab File ID: 2018.10.31_537A_027.d Lab Sample ID: MB 320-255789/1-A

Matrix: Water Date Extracted: 10/30/2018 11:16

Instrument ID: A8_N Date Analyzed: 10/31/2018 13:21

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-255789/2-A	2018.10.31_537A_028.d	10/31/2018 13:28
	LCSD 320-255789/3-A	2018.10.31_537A_029.d	10/31/2018 13:36
WGNA-101618-FRB-0755	320-44272-10	2018.10.31_537A_030.d	10/31/2018 13:43

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-44272-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-255789/1-A

Matrix: Water | Lab File ID: 2018.10.31_537A_027.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 10/30/2018 11:16

Sample wt/vol: 250(mL) | Date Analyzed: 10/31/2018 13:21

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.: 256102 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	96		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 10/25/2018 15:43

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		954978	2.58	794812	2.98		
UPPER LIMIT		1432467	3.08	1192218	3.48		
LOWER LIMIT		477489	2.08	397406	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-254941/10		971947	2.58	820552	2.98		
ICV 320-254941/12		974787	2.58	788400	2.98		
CCVL 320-255426/1		1045672	2.59	807617	2.99		
CCV 320-255426/2 CCVIS		1067229	2.61	821307	2.99		
MB 320-255321/1-A		1271392	2.59	947093	2.98		
LLCS 320-255321/2-A		1297890	2.59	966802	2.99		
320-44272-1	NAWC-101618-RW-275	1291728	2.59	960095	2.98		
320-44272-2	NAWC-101618-FRB-275	1304921	2.59	1007448	2.99		
320-44272-3	WGNA-101618-RW-4852	1323238	2.58	1051187	2.98		
320-44272-4	WGNA-101618-FRB-4852	1272446	2.58	1001145	2.98		
320-44272-5	WGNA-101618-RW-3124	1328861	2.59	1015500	2.98		
320-44272-6	WGNA-101618-FRB-3124	1313826	2.59	979995	2.99		
320-44272-7	WGNA-101618-RW-0404	1333879	2.59	958661	2.98		
320-44272-8	WGNA-101618-FRB-0404	1230573	2.59	928827	2.98		
CCV 320-255426/14 CCVIS		1006631	2.59	795894	2.99		
CCV 320-255428/14 CCVIS		1006631	2.59	795894	2.99		
320-44272-9	WGNA-101618-RW-0755	1377960	2.59	1055570	2.98		
320-44272-9 LMS	WGNA-101618-RW-0755 LMS	1266791	2.59	1016507	2.98		
320-44272-9 LMSD	WGNA-101618-RW-0755 LMSD	1289167	2.59	935846	2.98		
320-44272-11	WGNA-101618-RW-3073	1340633	2.59	1017696	2.98		
320-44272-12	WGNA-101618-FRB-3073	1245458	2.59	933488	2.98		
320-44272-13	WGNA-101618-RW-3178	1324118	2.59	1012780	2.98		
320-44272-14	WGNA-101618-FRB-3178	1325655	2.59	1048835	2.98		
320-44272-15	NAWC-101618-RW-194	1335175	2.59	1033459	2.98		
320-44272-16	NAWC-101618-FRB-194	1363884	2.59	985014	2.98		
CCV 320-255428/26 CCVIS		1084507	2.58	859268	2.98		
CCV 320-255429/26 CCVIS		1084507	2.58	859268	2.98		

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 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 10/25/2018 15:43

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		954978	2.58	794812	2.98		
UPPER LIMIT		1432467	3.08	1192218	3.48		
LOWER LIMIT		477489	2.08	397406	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-44272-17	WGNA-101618-RW-3220	1397238	2.59	1039189	2.98		
320-44272-18	WGNA-101618-FRB-3220	1349408	2.59	1020227	2.98		
320-44272-19	WGNA-101618-RW-3193	1288998	2.59	967386	2.98		
320-44272-20	WGNA-101618-FRB-3193	1323672	2.58	1016985	2.98		
MB 320-255322/1-A		1281124	2.59	964253	2.98		
LCS 320-255322/2-A		1249798	2.58	970943	2.98		
LCSD 320-255322/3-A		1236958	2.58	941047	2.98		
320-44272-21	WGNA-101618-DUP-48	1254458	2.58	937675	2.96		
CCV 320-255429/37 CCVIS		1045629	2.58	864394	2.98		
CCVL 320-256098/1		1024897	2.59	870904	2.98		
CCV 320-256102/22 CCVIS		942583	2.59	794921	2.98		
MB 320-255789/1-A		1312382	2.59	1049754	2.98		
LCS 320-255789/2-A		1266316	2.59	921046	2.98		
LCSD 320-255789/3-A		1226137	2.59	999068	2.98		
320-44272-10	WGNA-101618-FRB-0755	1231374	2.59	1016618	2.98		
CCV 320-256102/28 CCVIS		1112071	2.59	866499	2.98		

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 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Sample No.: CCV 320-255426/2 Date Analyzed: 10/28/2018 17:28

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.28_537A_005 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1067229	2.61	821307	2.99		
UPPER LIMIT		1494121	3.11	1149830	3.49		
LOWER LIMIT		747060	2.11	574915	2.49		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-255321/1-A		1271392	2.59	947093	2.98		
LLCS 320-255321/2-A		1297890	2.59	966802	2.99		
320-44272-1	NAWC-101618-RW-275	1291728	2.59	960095	2.98		
320-44272-2	NAWC-101618-FRB-275	1304921	2.59	1007448	2.99		
320-44272-3	WGNA-101618-RW-4852	1323238	2.58	1051187	2.98		
320-44272-4	WGNA-101618-FRB-4852	1272446	2.58	1001145	2.98		
320-44272-5	WGNA-101618-RW-3124	1328861	2.59	1015500	2.98		
320-44272-6	WGNA-101618-FRB-3124	1313826	2.59	979995	2.99		
320-44272-7	WGNA-101618-RW-0404	1333879	2.59	958661	2.98		
320-44272-8	WGNA-101618-FRB-0404	1230573	2.59	928827	2.98		

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 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Sample No.: CCV 320-255426/14 Date Analyzed: 10/28/2018 18:56

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.28_537A_017 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1006631	2.59	795894	2.99		
UPPER LIMIT		1409283	3.09	1114252	3.49		
LOWER LIMIT		704642	2.09	557126	2.49		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-255321/1-A		1271392	2.59	947093	2.98		
LLCS 320-255321/2-A		1297890	2.59	966802	2.99		
320-44272-1	NAWC-101618-RW-275	1291728	2.59	960095	2.98		
320-44272-2	NAWC-101618-FRB-275	1304921	2.59	1007448	2.99		
320-44272-3	WGNA-101618-RW-4852	1323238	2.58	1051187	2.98		
320-44272-4	WGNA-101618-FRB-4852	1272446	2.58	1001145	2.98		
320-44272-5	WGNA-101618-RW-3124	1328861	2.59	1015500	2.98		
320-44272-6	WGNA-101618-FRB-3124	1313826	2.59	979995	2.99		
320-44272-7	WGNA-101618-RW-0404	1333879	2.59	958661	2.98		
320-44272-8	WGNA-101618-FRB-0404	1230573	2.59	928827	2.98		

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 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Sample No.: CCV 320-255428/14 Date Analyzed: 10/28/2018 18:56

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.28_537A_017 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1006631	2.59	795894	2.99		
UPPER LIMIT		1409283	3.09	1114252	3.49		
LOWER LIMIT		704642	2.09	557126	2.49		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-44272-9	WGNA-101618-RW-0755	1377960	2.59	1055570	2.98		
320-44272-9 LMS	WGNA-101618-RW-0755 LMS	1266791	2.59	1016507	2.98		
320-44272-9 LMSD	WGNA-101618-RW-0755 LMSD	1289167	2.59	935846	2.98		
320-44272-11	WGNA-101618-RW-3073	1340633	2.59	1017696	2.98		
320-44272-12	WGNA-101618-FRB-3073	1245458	2.59	933488	2.98		
320-44272-13	WGNA-101618-RW-3178	1324118	2.59	1012780	2.98		
320-44272-14	WGNA-101618-FRB-3178	1325655	2.59	1048835	2.98		
320-44272-15	NAWC-101618-RW-194	1335175	2.59	1033459	2.98		
320-44272-16	NAWC-101618-FRB-194	1363884	2.59	985014	2.98		

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 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Sample No.: CCV 320-255428/26 Date Analyzed: 10/28/2018 20:24

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.28_537A_029 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1084507	2.58	859268	2.98		
UPPER LIMIT		1518310	3.08	1202975	3.48		
LOWER LIMIT		759155	2.08	601488	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-44272-9	WGNA-101618-RW-0755	1377960	2.59	1055570	2.98		
320-44272-9 LMS	WGNA-101618-RW-0755 LMS	1266791	2.59	1016507	2.98		
320-44272-9 LMSD	WGNA-101618-RW-0755 LMSD	1289167	2.59	935846	2.98		
320-44272-11	WGNA-101618-RW-3073	1340633	2.59	1017696	2.98		
320-44272-12	WGNA-101618-FRB-3073	1245458	2.59	933488	2.98		
320-44272-13	WGNA-101618-RW-3178	1324118	2.59	1012780	2.98		
320-44272-14	WGNA-101618-FRB-3178	1325655	2.59	1048835	2.98		
320-44272-15	NAWC-101618-RW-194	1335175	2.59	1033459	2.98		
320-44272-16	NAWC-101618-FRB-194	1363884	2.59	985014	2.98		

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 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Sample No.: CCV 320-255429/26 Date Analyzed: 10/28/2018 20:24

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.28_537A_029 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1084507	2.58	859268	2.98		
UPPER LIMIT		1518310	3.08	1202975	3.48		
LOWER LIMIT		759155	2.08	601488	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-44272-17	WGNA-101618-RW-3220	1397238	2.59	1039189	2.98		
320-44272-18	WGNA-101618-FRB-3220	1349408	2.59	1020227	2.98		
320-44272-19	WGNA-101618-RW-3193	1288998	2.59	967386	2.98		
320-44272-20	WGNA-101618-FRB-3193	1323672	2.58	1016985	2.98		
MB 320-255322/1-A		1281124	2.59	964253	2.98		
LCS 320-255322/2-A		1249798	2.58	970943	2.98		
LCSD 320-255322/3-A		1236958	2.58	941047	2.98		
320-44272-21	WGNA-101618-DUP-48	1254458	2.58	937675	2.96		

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 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Sample No.: CCV 320-255429/37 Date Analyzed: 10/28/2018 21:45

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.28_537A_040 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1045629	2.58	864394	2.98		
UPPER LIMIT		1463881	3.08	1210152	3.48		
LOWER LIMIT		731940	2.08	605076	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
320-44272-17	WGNA-101618-RW-3220	1397238	2.59	1039189	2.98		
320-44272-18	WGNA-101618-FRB-3220	1349408	2.59	1020227	2.98		
320-44272-19	WGNA-101618-RW-3193	1288998	2.59	967386	2.98		
320-44272-20	WGNA-101618-FRB-3193	1323672	2.58	1016985	2.98		
MB 320-255322/1-A		1281124	2.59	964253	2.98		
LCS 320-255322/2-A		1249798	2.58	970943	2.98		
LCSD 320-255322/3-A		1236958	2.58	941047	2.98		
320-44272-21	WGNA-101618-DUP-48	1254458	2.58	937675	2.96		

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 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Sample No.: CCV 320-256102/22 Date Analyzed: 10/31/2018 13:06

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.31_537A_025 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		942583	2.59	794921	2.98		
UPPER LIMIT		1319616	3.09	1112889	3.48		
LOWER LIMIT		659808	2.09	556445	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-255789/1-A		1312382	2.59	1049754	2.98		
LCS 320-255789/2-A		1266316	2.59	921046	2.98		
LCSD 320-255789/3-A		1226137	2.59	999068	2.98		
320-44272-10	WGNA-101618-FRB-0755	1231374	2.59	1016618	2.98		

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 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Sample No.: CCV 320-256102/28 Date Analyzed: 10/31/2018 13:50

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2018.10.31_537A_031 Heated Purge: (Y/N) N

Calibration ID: 41909

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		1112071	2.59	866499	2.98		
UPPER LIMIT		1556899	3.09	1213099	3.48		
LOWER LIMIT		778450	2.09	606549	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-255789/1-A		1312382	2.59	1049754	2.98		
LCS 320-255789/2-A		1266316	2.59	921046	2.98		
LCSD 320-255789/3-A		1226137	2.59	999068	2.98		
320-44272-10	WGNA-101618-FRB-0755	1231374	2.59	1016618	2.98		

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 537

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

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1 Analy Batch No.: 254941

SDG No.:

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

Calibration Start Date: 10/25/2018 14:59 Calibration End Date: 10/25/2018 15:43 Calibration ID: 41909

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-254941/2	2018.10.25_537ICAL_003.d
Level 2	IC 320-254941/3	2018.10.25_537ICAL_004.d
Level 3	IC 320-254941/4	2018.10.25_537ICAL_005.d
Level 4	IC 320-254941/5	2018.10.25_537ICAL_006.d
Level 5	IC 320-254941/6	2018.10.25_537ICAL_007.d
Level 6	IC 320-254941/7	2018.10.25_537ICAL_008.d
Level 7	IC 320-254941/8	2018.10.25_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 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.1273 1.1348	1.0472 1.1821	1.2473	1.1325	1.0470	Ave		1.1312				6.3		30.0			
Perfluoroheptanoic acid (PFHpA)	1.1170 1.0911	1.0831 1.0164	1.1125	1.0906	1.1077	Ave		1.0883				3.1		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.7276 1.4629	1.5144 1.5084	1.4933	1.5080	1.4474	Ave		1.5232				6.1		30.0			
Perfluorooctanoic acid (PFOA)	1.2693 1.1068	1.2760 1.0811	1.0751	1.0892	1.1110	Ave		1.1441				7.8		30.0			
Perfluorononanoic acid (PFNA)	0.7828 0.8003	0.9188 0.8042	0.8858	0.8660	0.8198	Ave		0.8397				6.1		30.0			
Perfluorooctanesulfonic acid (PFOS)	1.2092 1.0233	1.3067 1.0468	1.1301	1.0534	1.0463	Ave		1.1166				9.5		30.0			
13C2 PFHxA	0.9719 0.9620	0.9669 0.9685	0.9927	1.0476	1.0117	Ave		0.9888				3.2		30.0			
13C2 PFDA	0.7273 0.6763	0.6718 0.6663	0.6660	0.7153	0.7053	Ave		0.6898				3.7		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.: 320-44272-1 Analy Batch No.: 254941

SDG No.:

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

Calibration Start Date: 10/25/2018 14:59 Calibration End Date: 10/25/2018 15:43 Calibration ID: 41909

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-254941/2	2018.10.25_537ICAL_003.d
Level 2	IC 320-254941/3	2018.10.25_537ICAL_004.d
Level 3	IC 320-254941/4	2018.10.25_537ICAL_005.d
Level 4	IC 320-254941/5	2018.10.25_537ICAL_006.d
Level 5	IC 320-254941/6	2018.10.25_537ICAL_007.d
Level 6	IC 320-254941/7	2018.10.25_537ICAL_008.d
Level 7	IC 320-254941/8	2018.10.25_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	7850 1805727	15129 3593985	90415	321034	771338	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	10502 2168310	20433 4036861	107565	394448	1045338	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	12384 2396371	22521 4720764	111433	440068	1097729	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	11946 2201725	24097 4298280	104050	394334	1049529	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluorononanoic acid (PFNA)	13PF OA	Ave	7360 1590432	17333 3194105	85638	313227	773614	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	8839 1709437	19817 3340812	86001	313486	809220	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
13C2 PFHxA	13PF OA	Ave	913787 955852	912101 961713	959790	947296	954767	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDA	13PF OA	Ave	683785 672010	633723 661601	643936	646763	665573	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.: 320-44272-1 Analy Batch No.: 254941

SDG No.:

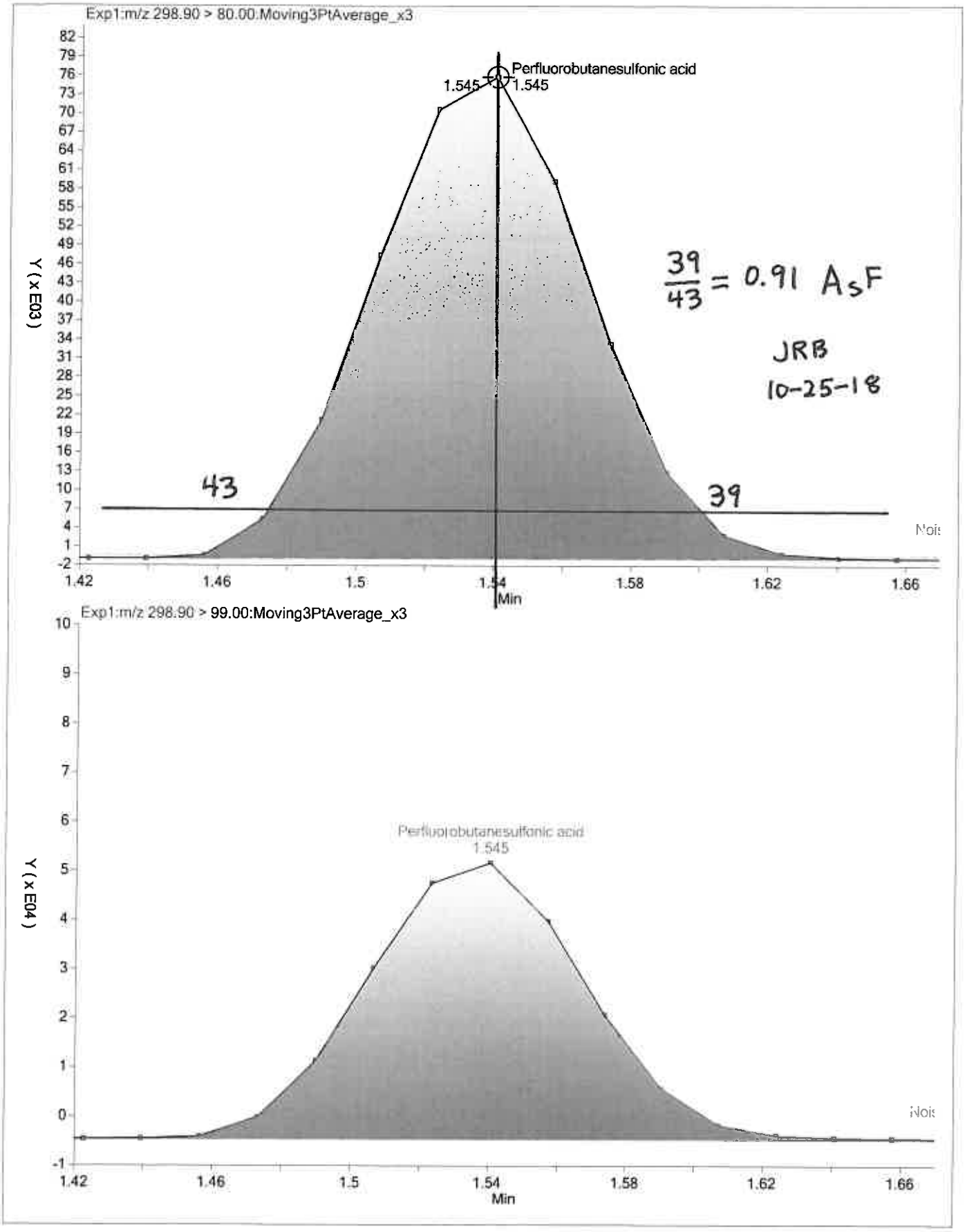
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 10/25/2018 14:59 Calibration End Date: 10/25/2018 15:43 Calibration ID: 41909

Calibration Files:

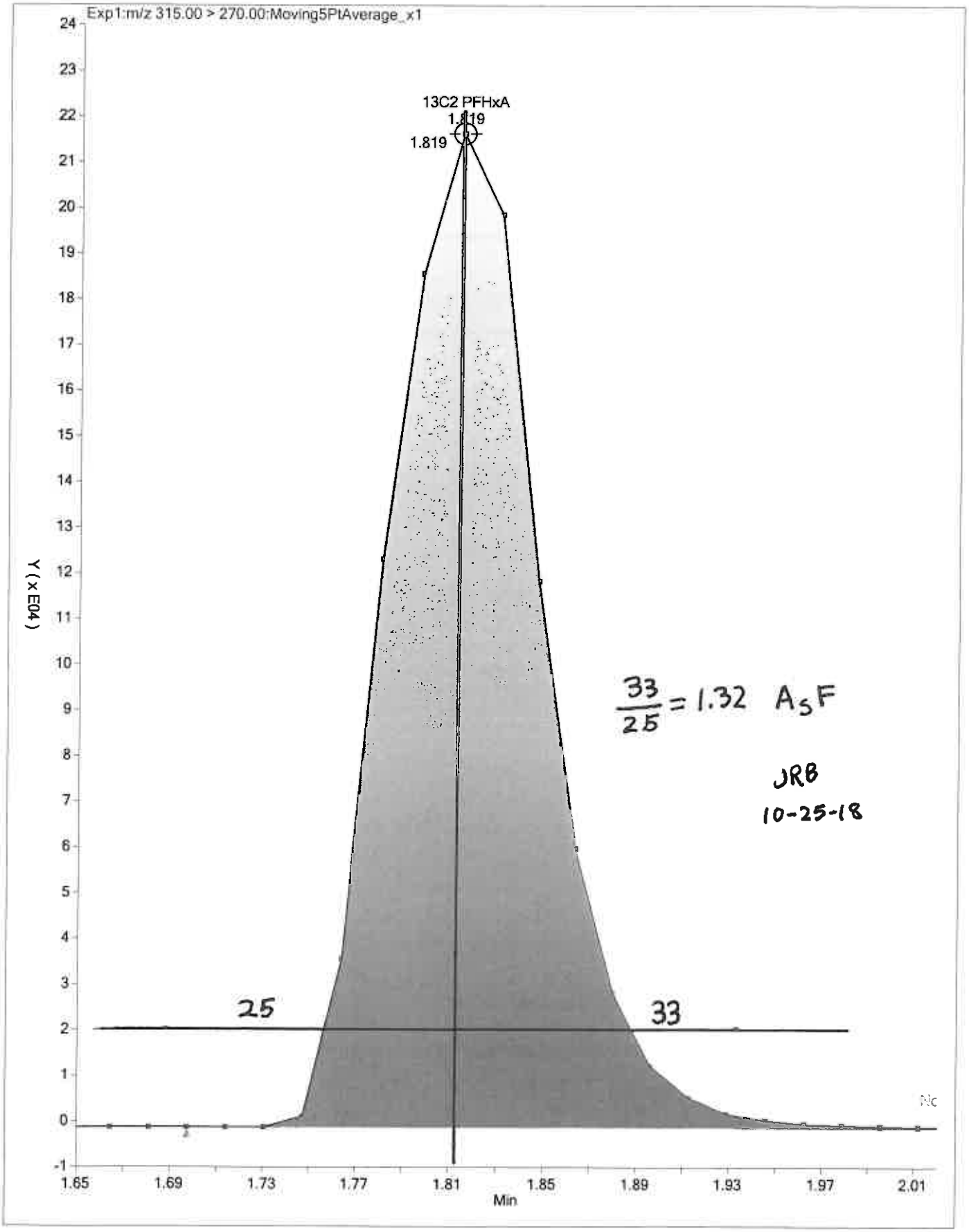
LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-254941/2	2018.10.25_537ICAL_003.d
Level 2	IC 320-254941/3	2018.10.25_537ICAL_004.d
Level 3	IC 320-254941/4	2018.10.25_537ICAL_005.d
Level 4	IC 320-254941/5	2018.10.25_537ICAL_006.d
Level 5	IC 320-254941/6	2018.10.25_537ICAL_007.d
Level 6	IC 320-254941/7	2018.10.25_537ICAL_008.d
Level 7	IC 320-254941/8	2018.10.25_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)	-0.3 4.5	-7.4	10.3	0.1	-7.4	0.3	50 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	2.6 -6.6	-0.5	2.2	0.2	1.8	0.3	50 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	13.4 -1.0	-0.6	-2.0	-1.0	-5.0	-4.0	50 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	10.9 -5.5	11.5	-6.0	-4.8	-2.9	-3.3	50 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-6.8 -4.2	9.4	5.5	3.1	-2.4	-4.7	50 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	8.3 -6.3	17.0	1.2	-5.7	-6.3	-8.3	50 30	30	30	30	30	30
13C2 PFHxA	-1.7 -2.0	-2.2	0.4	6.0	2.3	-2.7	30 30	30	30	30	30	30
13C2 PFDA	5.4 -3.4	-2.6	-3.4	3.7	2.2	-1.9	30 30	30	30	30	30	30



$\frac{39}{43} = 0.91$ A_SF

JRB
10-25-18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13C2 PFHxA
1.819
1.819
Y (x E04)
24
23
22
21
20
19
18
17
16
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14
13
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25
33
Nc
1.65
1.69
1.73
1.77
1.81
1.85
1.89
1.93
1.97
2.01
Min
33/25 = 1.32 A5F
JRB
10-25-18

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCVL 320-254941/10 Calibration Date: 10/25/2018 15:58

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.25_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	1.131	1.160		9.00	0.0442	2.6	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.236		1.00	0.0500	13.6	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.856		3.00	0.0455	21.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.011		2.00	0.0501	-11.6	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8737		5.00	0.0500	4.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	0.9171		4.00	0.0464	-17.9	50.0
13C2 PFHxA	Ave	0.9888	1.053		2.66	2.50	6.5	30.0
13C2 PFDA	Ave	0.6898	0.6953		2.52	2.50	0.8	30.0
d5-NEtFOSAA	Ave	1.078	1.156		2.68	2.50	7.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCVL 320-255426/1 Calibration Date: 10/28/2018 17:20

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.28_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	1.131	1.321		9.00	0.0442	16.8	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.110		1.00	0.0500	2.0	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.667		3.00	0.0455	9.4	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.266		2.00	0.0501	10.7	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8904		5.00	0.0500	6.0	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.398		4.00	0.0464	25.2	50.0
13C2 PFHxA	Ave	0.9888	1.017		2.57	2.50	2.9	30.0
13C2 PFDA	Ave	0.6898	0.7190		2.61	2.50	4.2	30.0
d5-NEtFOSAA	Ave	1.078	1.041		2.41	2.50	-3.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCV 320-255426/2 Calibration Date: 10/28/2018 17:28

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.28_537A_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.147		9.00	0.884	1.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.083		0.995	1.00	-0.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.500		3.00	0.910	-1.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.003		0.878	1.00	-12.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8424		5.00	1.00	0.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.089		4.00	0.928	-2.5	30.0
13C2 PFHxA	Ave	0.9888	0.9401		2.38	2.50	-4.9	30.0
13C2 PFDA	Ave	0.6898	0.6859		2.49	2.50	-0.6	30.0
d5-NEtFOSAA	Ave	1.078	1.078		2.50	2.50	0.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCV 320-255426/14 Calibration Date: 10/28/2018 18:56

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.28_537A_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.172		4.58	4.42	3.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.120		5.15	5.00	2.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.516		4.53	4.55	-0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.080		4.73	5.01	-5.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8705		5.18	5.00	3.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.103		4.58	4.64	-1.2	30.0
13C2 PFHxA	Ave	0.9888	0.9752		2.47	2.50	-1.4	30.0
13C2 PFDA	Ave	0.6898	0.7115		2.58	2.50	3.1	30.0
d5-NEtFOSAA	Ave	1.078	1.084		2.51	2.50	0.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCV 320-255428/14 Calibration Date: 10/28/2018 18:56

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.28_537A_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.172		4.58	4.42	3.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.120		5.15	5.00	2.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.516		4.53	4.55	-0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.080		4.73	5.01	-5.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8705		5.18	5.00	3.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.103		4.58	4.64	-1.2	30.0
13C2 PFHxA	Ave	0.9888	0.9752		2.47	2.50	-1.4	30.0
13C2 PFDA	Ave	0.6898	0.7115		2.58	2.50	3.1	30.0
d5-NEtFOSAA	Ave	1.078	1.084		2.51	2.50	0.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCV 320-255428/26 Calibration Date: 10/28/2018 20:24

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.28_537A_029.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.168		9.00	0.884	3.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.067		0.981	1.00	-1.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.543		3.00	0.910	1.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.074		0.939	1.00	-6.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8800		5.00	1.00	4.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.090		4.00	0.928	-2.4	30.0
13C2 PFHxA	Ave	0.9888	0.9810		2.48	2.50	-0.8	30.0
13C2 PFDA	Ave	0.6898	0.7114		2.58	2.50	3.1	30.0
d5-NEtFOSAA	Ave	1.078	1.078		2.50	2.50	0.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCV 320-255429/26 Calibration Date: 10/28/2018 20:24

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.28_537A_029.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.168		9.00	0.884	3.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.067		0.981	1.00	-1.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.543		3.00	0.910	1.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.074		0.939	1.00	-6.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8800		5.00	1.00	4.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.090		4.00	0.928	-2.4	30.0
13C2 PFHxA	Ave	0.9888	0.9810		2.48	2.50	-0.8	30.0
13C2 PFDA	Ave	0.6898	0.7114		2.58	2.50	3.1	30.0
d5-NEtFOSAA	Ave	1.078	1.078		2.50	2.50	0.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCV 320-255429/37 Calibration Date: 10/28/2018 21:45

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.28_537A_040.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.161		4.54	4.42	2.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.075		4.94	5.00	-1.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.533		4.58	4.55	0.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.126		4.93	5.01	-1.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8324		4.96	5.00	-0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.115		4.63	4.64	-0.1	30.0
13C2 PFHxA	Ave	0.9888	0.9741		2.46	2.50	-1.5	30.0
13C2 PFDA	Ave	0.6898	0.6723		2.44	2.50	-2.5	30.0
d5-NEtFOSAA	Ave	1.078	0.9803		2.27	2.50	-9.1	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCVL 320-256098/1 Calibration Date: 10/31/2018 10:31

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.31_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	1.131	1.154		9.00	0.0442	2.0	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.380		1.00	0.0500	26.8	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.664		3.00	0.0455	9.2	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.431		2.00	0.0501	25.0	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.9139		5.00	0.0500	8.8	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.197		4.00	0.0464	7.2	50.0
13C2 PFHxA	Ave	0.9888	1.072		2.71	2.50	8.5	30.0
13C2 PFDA	Ave	0.6898	0.7727		2.80	2.50	12.0	30.0
d5-NEtFOSAA	Ave	1.078	1.054		2.45	2.50	-2.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCV 320-256102/22 Calibration Date: 10/31/2018 13:06

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.31_537A_025.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.098		9.00	0.884	-2.9	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.134		1.04	1.00	4.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.524		3.00	0.910	0.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.108		0.969	1.00	-3.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8886		5.00	1.00	5.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.033		4.00	0.928	-7.5	30.0
13C2 PFHxA	Ave	0.9888	1.049		2.65	2.50	6.1	30.0
13C2 PFDA	Ave	0.6898	0.7334		2.66	2.50	6.3	30.0
d5-NEtFOSAA	Ave	1.078	1.099		2.55	2.50	1.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Lab Sample ID: CCV 320-256102/28 Calibration Date: 10/31/2018 13:50

Instrument ID: A8_N Calib Start Date: 10/25/2018 14:59

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/25/2018 15:43

Lab File ID: 2018.10.31_537A_031.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.240		4.84	4.42	9.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.080		4.96	5.00	-0.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.576		4.71	4.55	3.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.078		4.72	5.01	-5.7	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8508		5.07	5.00	1.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.087		4.52	4.64	-2.7	30.0
13C2 PFHxA	Ave	0.9888	0.997		2.52	2.50	0.8	30.0
13C2 PFDA	Ave	0.6898	0.6943		2.52	2.50	0.7	30.0
d5-NEtFOSAA	Ave	1.078	1.045		2.42	2.50	-3.1	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Instrument ID: A8_N Start Date: 10/25/2018 14:59

Analysis Batch Number: 254941 End Date: 10/25/2018 16:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-254941/2		10/25/2018 14:59	1	2018.10.25_537I CAL 003.d	GeminiC18 3x100 3(mm)
IC 320-254941/3		10/25/2018 15:06	1	2018.10.25_537I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-254941/4		10/25/2018 15:14	1	2018.10.25_537I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-254941/5 ICISAV		10/25/2018 15:21	1	2018.10.25_537I CAL 006.d	GeminiC18 3x100 3(mm)
IC 320-254941/6		10/25/2018 15:29	1	2018.10.25_537I CAL 007.d	GeminiC18 3x100 3(mm)
IC 320-254941/7		10/25/2018 15:36	1	2018.10.25_537I CAL 008.d	GeminiC18 3x100 3(mm)
IC 320-254941/8		10/25/2018 15:43	1	2018.10.25_537I CAL 009.d	GeminiC18 3x100 3(mm)
CCVL 320-254941/10		10/25/2018 15:58	1	2018.10.25_537I CAL 011.d	GeminiC18 3x100 3(mm)
ICB 320-254941/11		10/25/2018 16:05	1		GeminiC18 3x100 3(mm)
ICV 320-254941/12		10/25/2018 16:12	1	2018.10.25_537I CAL 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Instrument ID: A8_N Start Date: 10/28/2018 17:20

Analysis Batch Number: 255426 End Date: 10/28/2018 18:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-255426/1		10/28/2018 17:20	1	2018.10.28_537A 004.d	GeminiC18 3x100 3(mm)
CCV 320-255426/2 CCVIS		10/28/2018 17:28	1	2018.10.28_537A 005.d	GeminiC18 3x100 3(mm)
MB 320-255321/1-A		10/28/2018 17:42	1	2018.10.28_537A 007.d	GeminiC18 3x100 3(mm)
LLCS 320-255321/2-A		10/28/2018 17:50	1	2018.10.28_537A 008.d	GeminiC18 3x100 3(mm)
320-44272-1		10/28/2018 17:57	1	2018.10.28_537A 009.d	GeminiC18 3x100 3(mm)
320-44272-2		10/28/2018 18:04	1	2018.10.28_537A 010.d	GeminiC18 3x100 3(mm)
320-44272-3		10/28/2018 18:12	1	2018.10.28_537A 011.d	GeminiC18 3x100 3(mm)
320-44272-4		10/28/2018 18:19	1	2018.10.28_537A 012.d	GeminiC18 3x100 3(mm)
320-44272-5		10/28/2018 18:26	1	2018.10.28_537A 013.d	GeminiC18 3x100 3(mm)
320-44272-6		10/28/2018 18:34	1	2018.10.28_537A 014.d	GeminiC18 3x100 3(mm)
320-44272-7		10/28/2018 18:41	1	2018.10.28_537A 015.d	GeminiC18 3x100 3(mm)
320-44272-8		10/28/2018 18:49	1	2018.10.28_537A 016.d	GeminiC18 3x100 3(mm)
CCV 320-255426/14 CCVIS		10/28/2018 18:56	1	2018.10.28_537A 017.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Instrument ID: A8_N Start Date: 10/28/2018 18:56

Analysis Batch Number: 255428 End Date: 10/28/2018 20:24

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-255428/14 CCVIS		10/28/2018 18:56	1	2018.10.28_537A 017.d	GeminiC18 3x100 3(mm)
320-44272-9		10/28/2018 19:11	1	2018.10.28_537A 019.d	GeminiC18 3x100 3(mm)
320-44272-9 LMS		10/28/2018 19:18	1	2018.10.28_537A 020.d	GeminiC18 3x100 3(mm)
320-44272-9 LMSD		10/28/2018 19:25	1	2018.10.28_537A 021.d	GeminiC18 3x100 3(mm)
ZZZZZ		10/28/2018 19:33	1		GeminiC18 3x100 3(mm)
320-44272-11		10/28/2018 19:40	1	2018.10.28_537A 023.d	GeminiC18 3x100 3(mm)
320-44272-12		10/28/2018 19:48	1	2018.10.28_537A 024.d	GeminiC18 3x100 3(mm)
320-44272-13		10/28/2018 19:55	1	2018.10.28_537A 025.d	GeminiC18 3x100 3(mm)
320-44272-14		10/28/2018 20:02	1	2018.10.28_537A 026.d	GeminiC18 3x100 3(mm)
320-44272-15		10/28/2018 20:10	1	2018.10.28_537A 027.d	GeminiC18 3x100 3(mm)
320-44272-16		10/28/2018 20:17	1	2018.10.28_537A 028.d	GeminiC18 3x100 3(mm)
CCV 320-255428/26 CCVIS		10/28/2018 20:24	1	2018.10.28_537A 029.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Instrument ID: A8_N Start Date: 10/28/2018 20:24

Analysis Batch Number: 255429 End Date: 10/28/2018 21:45

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-255429/26 CCVIS		10/28/2018 20:24	1	2018.10.28_537A 029.d	GeminiC18 3x100 3(mm)
320-44272-17		10/28/2018 20:39	1	2018.10.28_537A 031.d	GeminiC18 3x100 3(mm)
320-44272-18		10/28/2018 20:46	1	2018.10.28_537A 032.d	GeminiC18 3x100 3(mm)
320-44272-19		10/28/2018 20:54	1	2018.10.28_537A 033.d	GeminiC18 3x100 3(mm)
320-44272-20		10/28/2018 21:01	1	2018.10.28_537A 034.d	GeminiC18 3x100 3(mm)
MB 320-255322/1-A		10/28/2018 21:16	1	2018.10.28_537A 036.d	GeminiC18 3x100 3(mm)
LCS 320-255322/2-A		10/28/2018 21:23	1	2018.10.28_537A 037.d	GeminiC18 3x100 3(mm)
LCSD 320-255322/3-A		10/28/2018 21:30	1	2018.10.28_537A 038.d	GeminiC18 3x100 3(mm)
320-44272-21		10/28/2018 21:38	1	2018.10.28_537A 039.d	GeminiC18 3x100 3(mm)
CCV 320-255429/37 CCVIS		10/28/2018 21:45	1	2018.10.28_537A 040.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Instrument ID: A8_N Start Date: 10/31/2018 10:31

Analysis Batch Number: 256098 End Date: 10/31/2018 12:07

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-256098/1		10/31/2018 10:31	1	2018.10.31_537A 004.d	GeminiC18 3x100 3(mm)
CCV 320-256098/2 CCVIS		10/31/2018 10:39	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 10:54	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 11:01	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 11:08	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 11:16	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 11:23	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 11:30	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 11:38	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 11:45	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 11:53	1		GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2018 12:00	1		GeminiC18 3x100 3(mm)
CCV 320-256098/14 CCVIS		10/31/2018 12:07	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Instrument ID: A8_N Start Date: 10/31/2018 13:06

Analysis Batch Number: 256102 End Date: 10/31/2018 13:50

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-256102/22 CCVIS		10/31/2018 13:06	1	2018.10.31_537A_025.d	GeminiC18 3x100 3(mm)
MB 320-255789/1-A		10/31/2018 13:21	1	2018.10.31_537A_027.d	GeminiC18 3x100 3(mm)
LCS 320-255789/2-A		10/31/2018 13:28	1	2018.10.31_537A_028.d	GeminiC18 3x100 3(mm)
LCSD 320-255789/3-A		10/31/2018 13:36	1	2018.10.31_537A_029.d	GeminiC18 3x100 3(mm)
320-44272-10		10/31/2018 13:43	1	2018.10.31_537A_030.d	GeminiC18 3x100 3(mm)
CCV 320-256102/28 CCVIS		10/31/2018 13:50	1	2018.10.31_537A_031.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Batch Number: 255321 Batch Start Date: 10/27/18 06:11 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 10/27/18 13:32

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00086
MB 320-255321/1		537, 537				250.00 mL	10.00 mL	7 SU	500 uL
LLCS 320-255321/2		537, 537				250.00 mL	10.00 mL	7 SU	500 uL
320-44272-A-1	NAWC-101618-RW-275	537, 537	T	276.39 g	28.24 g	248.2 mL	10.00 mL	7 SU	500 uL
320-44272-A-2	NAWC-101618-FRB-275	537, 537	T	270.98 g	27.73 g	243.3 mL	10.00 mL	7 SU	500 uL
320-44272-A-3	WGNA-101618-RW-4852	537, 537	T	283.29 g	28.56 g	254.7 mL	10.00 mL	7 SU	500 uL
320-44272-A-4	WGNA-101618-FRB-4852	537, 537	T	287.56 g	27.70 g	259.9 mL	10.00 mL	7 SU	500 uL
320-44272-A-5	WGNA-101618-RW-3124	537, 537	T	277.54 g	28.30 g	249.2 mL	10.00 mL	7 SU	500 uL
320-44272-A-6	WGNA-101618-FRB-3124	537, 537	T	269.99 g	27.33 g	242.7 mL	10.00 mL	7 SU	500 uL
320-44272-A-7	WGNA-101618-RW-0404	537, 537	T	282.70 g	29.78 g	252.9 mL	10.00 mL	7 SU	500 uL
320-44272-A-8	WGNA-101618-FRB-0404	537, 537	T	281.37 g	27.45 g	253.9 mL	10.00 mL	7 SU	500 uL
320-44272-A-9	WGNA-101618-RW-0755	537, 537	T	278.54 g	28.31 g	250.2 mL	10.00 mL	7 SU	500 uL
320-44272-A-9 LMS	WGNA-101618-RW-0755	537, 537	T	287.84 g	28.37 g	259.5 mL	10.00 mL	7 SU	500 uL
320-44272-A-9 LMSD	WGNA-101618-RW-0755	537, 537	T	283.87 g	28.58 g	255.3 mL	10.00 mL	7 SU	500 uL
320-44272-A-11	WGNA-101618-RW-3073	537, 537	T	269.41 g	28.70 g	240.7 mL	10.00 mL	7 SU	500 uL
320-44272-A-12	WGNA-101618-FRB-3073	537, 537	T	279.70 g	27.92 g	251.8 mL	10.00 mL	7 SU	500 uL
320-44272-A-13	WGNA-101618-RW-3178	537, 537	T	281.53 g	28.82 g	252.7 mL	10.00 mL	7 SU	500 uL
320-44272-A-14	WGNA-101618-FRB-3178	537, 537	T	273.93 g	27.64 g	246.3 mL	10.00 mL	7 SU	500 uL
320-44272-A-15	NAWC-101618-RW-194	537, 537	T	277.17 g	28.50 g	248.7 mL	10.00 mL	7 SU	500 uL
320-44272-A-16	NAWC-101618-FRB-194	537, 537	T	284.25 g	27.40 g	256.9 mL	10.00 mL	7 SU	500 uL
320-44272-A-17	WGNA-101618-RW-3220	537, 537	T	282.91 g	29.42 g	253.5 mL	10.00 mL	7 SU	500 uL
320-44272-A-18	WGNA-101618-FRB-3220	537, 537	T	282.50 g	27.93 g	254.6 mL	10.00 mL	7 SU	500 uL
320-44272-A-19	WGNA-101618-RW-3193	537, 537	T	276.71 g	28.49 g	248.2 mL	10.00 mL	7 SU	500 uL

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.: 320-44272-1

SDG No.:

Batch Number: 255321 Batch Start Date: 10/27/18 06:11 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 10/27/18 13:32

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00086
320-44272-A-20	WGNA-101618-FRB-3193	537, 537	T	279.19 g	27.36 g	251.8 mL	10.00 mL	7 SU	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-SU 00083	LC537SP 00009	AnalysisComment			
MB 320-255321/1		537, 537		500 uL		Chlorine, ND			
LLCS 320-255321/2		537, 537		500 uL	500 uL	Chlorine, ND			
320-44272-A-1	NAWC-101618-RW-275	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-2	NAWC-101618-FRB-275	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-3	WGNA-101618-RW-4852	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-4	WGNA-101618-FRB-4852	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-5	WGNA-101618-RW-3124	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-6	WGNA-101618-FRB-3124	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-7	WGNA-101618-RW-0404	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-8	WGNA-101618-FRB-0404	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-9	WGNA-101618-RW-0755	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-9 LMS	WGNA-101618-RW-0755	537, 537	T	500 uL	500 uL	Chlorine, ND			
320-44272-A-9 LMSD	WGNA-101618-RW-0755	537, 537	T	500 uL	500 uL	Chlorine, ND			
320-44272-A-11	WGNA-101618-RW-3073	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-12	WGNA-101618-FRB-3073	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-13	WGNA-101618-RW-3178	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-14	WGNA-101618-FRB-3178	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-15	NAWC-101618-RW-194	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-16	NAWC-101618-FRB-194	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.: 320-44272-1

SDG No.:

Batch Number: 255321 Batch Start Date: 10/27/18 06:11 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 10/27/18 13:32

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-SU 00083	LC537SP 00009	AnalysisComment			
320-44272-A-17	WGNA-101618-RW-3220	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-18	WGNA-101618-FRB-3220	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-19	WGNA-101618-RW-3193	537, 537	T	500 uL		Chlorine, ND			
320-44272-A-20	WGNA-101618-FRB-3193	537, 537	T	500 uL		Chlorine, ND			

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA labels SKD 10/27/18
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1408094
Manifold ID	P, Y
Methanol ID	1410818
pH Indicator ID	3718
Pipette ID	I 46162G
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	MNV
Analyst ID - SU Reagent Drop	SKD
Analyst ID - SU Reagent Drop Witness	MNV
Analyst ID - TA Reagent Drop	SKD
Analyst ID - TA Reagent Drop Witness	MNV
SPE Cartridge Lot ID	6413968-03
Trizma ID	SLBR5241V
Reagent Water ID	10/24/18

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.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Batch Number: 255322 Batch Start Date: 10/27/18 06:19 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 10/27/18 13:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00086
MB 320-255322/1		537, 537				250.00 mL	10.00 mL	7 SU	500 uL
LCS 320-255322/2		537, 537				250.00 mL	10.00 mL	7 SU	500 uL
LCSD 320-255322/3		537, 537				250.00 mL	10.00 mL	7 SU	500 uL
320-44272-A-21	WGNA-101618-DUP-48	537, 537	T	281.68 g	28.23 g	253.5 mL	10.00 mL	7 SU	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-SU 00083	LC537SP 00010	AnalysisComment			
MB 320-255322/1		537, 537		500 uL		Chlorine, ND			
LCS 320-255322/2		537, 537		500 uL	500 uL	Chlorine, ND			
LCSD 320-255322/3		537, 537		500 uL	500 uL	Chlorine, ND			
320-44272-A-21	WGNA-101618-DUP-48	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.: 320-44272-1

SDG No.:

Batch Number: 255322 Batch Start Date: 10/27/18 06:19 Batch Analyst: Kouchari, Shamiran

Batch Method: 537 Batch End Date: 10/27/18 13:40

Batch Notes	
Analyst ID - Aliquot Step	SKD
Batch Comment	Client labels match TA labels SKD 10/27/18
Analyst ID - Final Volume Step	SKD
Internal Standard ID#	1408094
Manifold ID	E
Methanol ID	1410818
pH Indicator ID	3718
Pipette ID	I 46162G
Analyst ID - IS Reagent Drop	SKD
Analyst ID - IS Reagent Drop Witness	MNV
Analyst ID - SU Reagent Drop	SKD
Analyst ID - SU Reagent Drop Witness	MNV
Analyst ID - TA Reagent Drop	SKD
Analyst ID - TA Reagent Drop Witness	MNV
SPE Cartridge Lot ID	6413968-03
Trizma ID	SLBR5241V
Reagent Water ID	10/24/18

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.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44272-1

SDG No.:

Batch Number: 255789 Batch Start Date: 10/30/18 11:16 Batch Analyst: Hoang, Dalena T

Batch Method: 537 Batch End Date: 10/30/18 18:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00086
MB 320-255789/1		537, 537				250 mL	10.00 mL	7 SU	500 uL
LCS 320-255789/2		537, 537				250 mL	10.00 mL	7 SU	500 uL
LCSD 320-255789/3		537, 537				250 mL	10.00 mL	7 SU	500 uL
320-44272-B-10	WGNA-101618-FRB-0755	537, 537	T	300.40 g	27.32 g	273.1 mL	10.00 mL	7 SU	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-SU 00083	LC537SP 00010	AnalysisComment			
MB 320-255789/1		537, 537		500 uL		Chlorine ND			
LCS 320-255789/2		537, 537		500 uL	500 uL	Chlorine ND			
LCSD 320-255789/3		537, 537		500 uL	500 uL	Chlorine ND			
320-44272-B-10	WGNA-101618-FRB-0755	537, 537	T	500 uL		Chlorine ND			

Batch Notes	
Batch Comment	Client ID matches label: DTH 10/30/18
Internal Standard ID#	1408094
Manifold ID	M
Methanol ID	1410828
pH Indicator ID	3718
Pipette ID	I46345G
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	DTH
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	DTH
Analyst ID - TA Reagent Drop	VPM
Analyst ID - TA Reagent Drop Witness	DTH
SPE Cartridge Lot ID	6413968-03
Trizma ID	SLBR5241V
Reagent Water ID	10/29/18

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.: 320-44272-1

SDG No.:

Batch Number: 255789 Batch Start Date: 10/30/18 11:16 Batch Analyst: Hoang, Dalena T

Batch Method: 537 Batch End Date: 10/30/18 18:00

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.

Archived: Wednesday, November 14, 2018 1:13:02 PM
From: Alltucker, David
Sent: Wednesday, November 14, 2018 11:38:24 AM
To: Solomon, Terri
Subject: RE: NAS JRB Willow Grove
Importance: Normal
Attachments:
320-44272 example calculation.pdf

Terri,
I am sorry I meant to send this yesterday. The attached has the example calculation for the PFOA result. It does appear that the issue is due to the result on the form being the rounded result after applying significate figures. The LIMS is using the unrounded value of 19.6 instead of the 20 for the sample concentration and 23.78 instead of 23.8 for the MS concentration to preform the percent recovery calculation.

Thank you,

DAVID ALLTUCKER
Project Manager

Test America
THE LEADER IN ENVIRONMENTAL TESTING

880 Riverside Parkway
West Sacramento, CA 95605
(916) 374-4383
(916) 372-1059 (fax)
www.testamericainc.com

From: Solomon, Terri [mailto:Terri.Solomon@tetratech.com]
Sent: Wednesday, November 14, 2018 4:33 AM
To: Alltucker, David
Subject: RE: NAS JRB Willow Grove

-External Email-

David,

Do you have a response from the laboratory about the calculation of the percent recovery?

Thanks,
Terri

From: Alltucker, David <David.Alltucker@testamericainc.com>
Sent: Friday, November 09, 2018 1:34 PM
To: Solomon, Terri <Terri.Solomon@tetratech.com>
Cc: Woeber, Michelle <Michelle.Woeber@tetratech.com>
Subject: RE: NAS JRB Willow Grove

Terri,
I am asking out data group to provide the calculation being made. I'm guessing the calculation is being done on the values before the significant figures are applied to the values on the form.

Thank you,

DAVID ALLTUCKER
Project Manager

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(916) 372-1059 (fax)
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From: Solomon, Terri [mailto:Terri.Solomon@tetratech.com]
Sent: Friday, November 09, 2018 9:38 AM
To: Alltucker, David
Cc: Woeber, Michelle
Subject: NAS JRB Willow Grove

-External Email-

David,

I am currently validating a data package for Willow Grove, SDG 320-44272-1, and have the following question. On page 169 of the data package there are matrix spike percent recoveries calculated. One of the items I have to check is that the percent recovery is calculated correctly. When I calculate the percent recovery for PFOA I get a percent of 98.4. The laboratory reports a percent of 109. Can you please tell me how that percent recovery is calculated. There are also several other percent recoveries that I also can't get to match what the laboratory has reported.

Thanks,
Terri

Terri Solomon | **Environmental Scientist**
Direct: 412.921.7113 | Main: 412.921.7090 | Fax: 412.921.4040
terri.solomon@tetratech.com

Tetra Tech | Complex World, **Clear Solutions™**
661 Andersen Drive Foster Plaza 7 | Pittsburgh, PA 15220-2700 | www.tetratech.com

Live Green, Work Green, Save Green

FORM III
LCMS LOW LEVEL MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento   Job No.: 320-44272-1

SDG No.:

Matrix: Water   Level: Low   Lab File ID: 2018.10.28_537A_020.d

Lab ID: 320-44272-9 LMS   Client ID: WGNA-101618-RW-0755 LMS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	LMS CONCENTRATION (ng/L)	LMS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	3.58	27	27.9	36	50-150	4
Perfluorooctanoic acid (PFOA)	3.86	20	23.8	109	50-150	M 4
Perfluorononanoic acid (PFNA)	3.85	1.6 J	4.91	87	50-150	
Perfluorohexanesulfonic acid (PFHxS)	3.51	32	34.5	65	50-150	4
Perfluoroheptanoic acid (PFHpA)	3.85	5.1	8.99	100	50-150	
Perfluorobutanesulfonic acid (PFBS)	3.41	5.9	9.19	97	50-150	

PFOA

$$\left(\frac{357775 \text{ (area of analyte)}}{1266791 \text{ (area of IS)}}\right)\left(\frac{2.50 \text{ (conc. of IS)}}{1.144078 \text{ (RRF)}}\right) = 0.6174 \text{ ng/mL}$$

$$(617.4 \text{ ng/L})(1)(0.038536 \text{ prep factor}) = 23.78 \text{ ng/L}$$

$$\% R = 23.78 \text{ (LMS conc)} - 19.6 \text{ (sample conc)} = 4.16 / 3.86 = 109\%$$

Column to be used to flag recovery and RPD values

FORM III 537

PFAS Calibration Calculations:

Initial Calibration 10/25/2018
Instrument A8_N

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
0.025	11946	940209	2.5	1.27057	1.2693
0.0501	24097	943285	2.5	1.27474	1.276
0.25	104050	966840	2.5	1.07619	1.0751
1	394334	904232	2.5	1.09025	1.0892
2.5	1049529	943717	2.5	1.11212	1.111
5	2201725	993600	2.5	1.10795	1.1068
10	4298280	992963	2.5	1.08219	1.0811
			Average	1.14486	1.1441
			Standard Deviation	0.0883	
			RSD	0.0771	
			%RSD	7.70874	7.8

Continuing Calibration 10/28/2018 @ 17:20
PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
0.0501	26507	1045672	2.5	1.2649	10.561366	1.266	10.7

Sample Identification WGNA-101618-RW-0755
Compound PFOA

Compound Area	308953	Average RRF	1.144
Internal Standard Amount (ng)	2.5	Sample Volume(ml)	250.2
Dilution Factor	1	Volume Extract (ml)	10
Internal Standard Area	1377960		
Concentration	19.5831	ng/L	
Reported Result	20	ng/L	

MS/MSD %R WGNA-101618-RW-0755

PFOA MS %R	Spike amount	MS concentration	Sample Result
98.45	3.86	23.8	20

PFOA MSD %R	Spike amount	MSD concentration	Sample Result
132.65	3.92	25.2	20

MS/MSD RPD
5.71

Surrogate PFHxA

Compound Area	1338082		
Internal Standard Amount (ng)	2.5		
Dilution Factor	1	Volume Extract (ml)	10
Internal Standard Area	1377960	Injection Volume (µl	10
Average RRF	0.9888		
Concentration	2.4551		
Surrogate %R	98.21	Spike amount	2.5

LCS %R 320-255322/2-A

PFOA	Spike amount	LCS concentration
99.00	200	198

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20181028-66704.b\2018.10.28_537A_019.d
Lims ID: 320-44272-A-9-A
Client ID: WGNA-101618-RW-0755
Sample Type: Client
Inject. Date: 28-Oct-2018 19:11:08 ALS Bottle#: 11 Worklist Smp#: 16
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-44272-a-9-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20181028-66704.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 29-Oct-2018 10:51:03 Calib Date: 25-Oct-2018 15:43:40
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20181025-66581.b\2018.10.25_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: CTX0314

First Level Reviewer: barnettj Date: 29-Oct-2018 10:40:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.545	1.545	0.0	1.000	73430	0.1470		22.9	
298.90 > 99.00	1.545	1.545	0.0	1.000	53985		1.36(0.00-0.00)	26.1	
13 Perfluorohexanoic acid									
313.00 > 269.00	1.819	1.819	0.0	0.702	130373	0.2660		33.8	
313.00 > 119.00	1.819	1.819	0.0	0.702	13453		9.69(0.00-0.00)	37.2	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.835	1.835	0.0	1.000	1338028	2.46		7102	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.205	2.205	0.0	1.000	77150	0.1286		11.6	
363.00 > 169.00	2.205	2.205	0.0	1.000	28927		2.67(0.00-0.00)	32.1	
3 Perfluorohexanesulfonic acid									M
399.00 > 80.00	2.237	2.238	-0.001	1.000	541412	0.8048		397	M
399.00 > 99.00	2.237	2.238	-0.001	1.000	180867		2.99(0.00-0.00)	141	
* 5 13C2 PFOA									s
415.00 > 370.00	2.592	2.592	0.0		1377960	2.50		9226	
6 Perfluorooctanoic acid									M
413.00 > 369.00	2.592	2.592	0.0	1.000	308953	0.4899		30.2	
413.00 > 169.00	2.592	2.592	0.0	1.000	179738		1.72(0.00-0.00)	249	M
8 Perfluorooctanesulfonic acid									
499.00 > 80.00	2.994	2.994	0.0	1.000	327553	0.6642		112	
499.00 > 99.00	2.994	2.994	0.0	1.000	70168		4.67(0.00-0.00)	126	
* 7 13C4 PFOS									
503.00 > 80.00	2.978	2.994	-0.016		1055570	2.39		1659	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.994	2.994	0.0	1.000	18154	0.0392		1.9	M
463.00 > 169.00	2.978	2.994	-0.016	0.995	2764		6.57(0.00-0.00)	16.1	M
$ 10 13C2 PFDA									
515.00 > 470.00	3.348	3.348	0.0	1.000	916546	2.41		5720	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
* 12 d3-NMeFOSAA									
573.00 > 419.00	3.509	3.509	0.0		418934	2.50		3239	
$ 11 d5-NEtFOSAA									
589.00 > 419.00	3.686	3.686	0.0	1.050	457915	2.53		745	

QC Flag Legend

Processing Flags

s - Failed ISTD Recovery Test

Review Flags

M - Manually Integrated

Preliminary Data - For Official Use Only

C:\All_Projects\112G08005\WE04\FS.DR.03\WGNA_201901.mxd MKB 2/14/2019

N

NSDALE

UPPER GWYNEDD

MONTGOMERY

WARRINGTON

WARWICK

NORTHAMPTON

IVYLAND

WARMINSTER

HORSHAM

HAGS

NASJRB Willow Grove

LOWER GWYNEDD

HATBORO

UPPER SOUTHAMPTON

UPPER DUBLIN

UPPER MORELAND

LOWER MORELAND

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

5,000 2,500 0 5,000

Feet

NAVFAC

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

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