Submissions to the State of North Carolina and Cape Fear River Watch

The following table identifies Consent Order submissions by Chemours for the period of April 1, 2019 through the end of the second quarter on June 30, 2019.[1]

CO Section	Submitted To	Title	Submitted Date
Other	NCDEQ	Southeast Perched Zone Investigation Report	04/10/2019
12	NCDEQ	Cape Fear River PFAS Mass Loading Model Scope of Work	04/11/2019
Other	NCDEQ	Post Hurricane Florence PFAS Characterization Report	04/13/2019
8	NCDAQ	VE-N Carbon Bed Stack Test Report	04/15/2019
8	NCDAQ	Division and Blower Stack Test Report	04/15/2019
8	NCDAQ	Monthly Emissions Report	04/22/2019
8	NCDAQ	VE-N Carbon Bed and Division Stack Test Report	04/22/2019
24	NCDEQ	Drinking Water Compliance Plan	04/26/2019
28	NCDEQ	Consent Order Quarterly Progress Report	04/30/2019
11	NCDWR	Table 3+ Standard Operating Procedures - Eurofins	05/06/2019
11	NCDWR	Table 3+ Standard Operating Procedures - TestAmerica	05/06/2019
11	NCDWR	Updated PFAS Characterization Sampling Plan and Responses to Comments	05/06/2019
26	NCDEQ	Total Organic Fluorine - Sampling Plan	05/06/2019
26	NCDEQ	Total Organic Fluorine Proposal - Request for Approval	05/06/2019
14	NCDEQ	Responses to Laboratory Questions - Charles River	05/09/2019
14	NCDEQ	Responses to Laboratory Questions - EAG	05/09/2019
12	NCDEQ	Old Outfall 002 Remedial Options Plan	05/20/2019
8	NCDAQ	Monthly Emissions Report	05/21/2019
12	NCDEQ	PFAS Mass Loading Model SOW Response to Comments	05/31/2019
11	NCDWR	Outfall 002 Sampling Data and Letter	06/10/2019
11	NCDWR	TestAmerica Technical Memorandum regarding DFSA	06/10/2019
23	NCDEQ	Consent Order Paragraph 23 Notification	06/10/2019
Other	NCDEQ	Results of Temporary Perched Zone Groundwater Pumping	06/17/2019
11	NCDWR	Follow-up Letter re MTP, MMF, DFSA, and PPF Acid	06/18/2019
11	NCDWR	TestAmerica Technical Summary for MTP, MMF, DFSA, PPF Acid	06/18/2019
11	NCDWR	Lancaster Technical Summary for MTP, MMF, DFSA, PPF Acid	06/18/2019
8	NCDAQ	PPA and VE-S Stack Test Reports	06/21/2019
8	NCDAQ	Monthly Emissions Report	06/21/2019
27	NCDEQ	Fate and Transport Study	06/25/2019

[1] Consent Order submissions by Chemours from lodging of the Proposed Consent Order in November 2018 through March 31, 2019 were presented in the 1st quarter report.

Replacement Drinking Water Actions

(Actions below represent replacement drinking water actions from November 2018[2] - June 30, 2019.)

Bottled Water	Residences Eligible for Bottled Water	Eligible and Declined	Eligible and Vacant	Eligible and Already on Public Water	Eligible Residences Receiving Bottled Water
	754	12	0	3	739

GAC	Residences Eligible for GAC	Number of residences that have Responded to GAC Offer	Number of residences that have NOT Responded to GAC Offer	GAC Residence Response Rate	Connected to Public Water	Public Water Readily Available	Public Water Feasible
	191	67	124	35%	3	13	36

	GAC Systems to Install	Initial Interviews Conducted	Total Sheds Dropped	Total Systems Completed & Online	Initial Sampling Complete	GAC Change Outs
	139	67	51	47	47	7

RO	Eligible (including houses that share a well)	Number of residences that have Responded to RO Offer	Number of residences that have NOT Responded to RO Offer	RO Residence Response Rate	Declined Offer	Systems Installed	RO Systems to Install
	566	210	356	37%	8	127	431

Drinking Water Data to State	Sample Delivery Group (SDG) Emailed or Uploaded	Percentage Within 7 days of Final Data
	212	100

Drinking Water Data to Residents	Sample Results	Percentage Within Timeframe (7 or 30 days) Delivered or Attempted
	1,038	100

[2] The date the proposed Consent Order was lodged.

Consent Order Progress Details

This section summarizes the activities that have been undertaken by Chemours pursuant to the Consent Order Compliance Measures for the period from April 1, 2019 through the end of the second quarter of 2019 (June 30, 2019).

Paragraph 7 - Control Technology Improvements

Paragraph 7c - Thermal Oxidizer *(see inset photos)*

- Chemours construction activities continue on schedule for completion of installation and startup of the thermal oxidizer by December 31, 2019. Foundations are poured at the facility, and construction of the equipment continues offsite by the supplier for delivery and installation later this year.

Paragraph 8 - GenX Emissions Reduction Milestones

- As required under the Consent Order, monthly emissions reports were submitted on April 22, 2019, May 21, 2019, and June 21, 2019. The reports provide the details of emissions to date to meet the Consent Order requirements of 82% and 92% for plant-wide interim reductions of air emissions of GenX Compounds.
- Emissions testing of the first product campaigns in 2019 have been conducted for all products except for EVE and IXM CR. The first product campaigns for EVE and IXM CR will occur later in 2019 and will be tested then.

Paragraph 10 - No Discharge of Process Wastewater from Chemours' Manufacturing Areas

- Chemours continues to not discharge its process wastewater and to ship all of its process wastewater offsite for disposal.

Paragraph 11 - Characterization of PFAS in Process and Non-Process Wastewater and Stormwater at the Facility

Paragraph 11a - Test Methods and Lab Standards

- Comments from NCDEQ and USEPA on the non-targeted analysis plan were received and addressed. On May 6, 2019, Chemours submitted a response to comments table alongside updated TestAmerica and Eurofins Lancaster Table 3+ standard operating procedures. On May 30, 2019, Chemours provided updated TestAmerica and Eurofins Lancaster 537 standard operating procedures to NCDEQ.
- On June 18, 2019, Chemours submitted a letter to the State notifying of continued development of analytical methods for Table 3+ compounds.
- Chemours collected Chemours process water samples for non-targeted analysis during its first sampling event pursuant to Consent Order paragraph 11c on June 27, 2019.

Paragraph 11b - Sampling Plan

- Comments from NCDEQ, USEPA and Cape Fear River Watch on the sampling plan were received between March and April 2019.
- On May 6, 2019, Chemours submitted a response to comments table and a revised workplan to NCDEQ and Cape Fear River Watch for review.
- On June 24, 2019, NCDEQ approved the paragraph 11b sampling workplan.

Paragraph 11c - Initial Characterization

- Chemours completed planning for the first round of initial characterization sampling, including the purchase of auto-samplers, coordination with analytical laboratories, and refining sample collection methods.
- The first initial characterization event occurred during the week of April 22, 2019. This event was conducted during a period where there was no rain, so no stormwater only samples were collected.
- The second initial characterization sampling event occurred on June 27, 2019. There was insufficient rain to collect stormwater samples so no stormwater only samples were collected. The next sampling event is planned to occur in August 2019.
- Chemours contractors did collect stormwater grab samples from 24 locations during a relatively brief storm event on June 5, 2019. These samples were collected to support Paragraph 12 deliverables due August 26, 2019.
- The paragraph 11c quarterly report will be submitted under separate cover by July 31, 2019.

Paragraph 11.1 - Characterization of PFAS Contamination in Downstream Raw Water Intakes

- Chemours' contractors Geosyntec and Parsons sampled the Cape Fear River in May and June 2019 at sampling locations adjacent to the water intakes of Bladen Bluffs and Kings Bluff Intake Canal. This sampling was completed in parallel with paragraph 12a activities.

Paragraph 11.2 - Characterization of PFAS Contamination in River Sediment

- Chemours' contractor Geosyntec is preparing a workplan pursuant to paragraph 11.2.

Paragraph 12 - Accelerated Reduction of PFAS Contamination in the Cape Fear River and Downstream Water Intakes

Paragraph 12a - Accelerated Reduction of PFAS Contamination in the Cape Fear River and Downstream Water Intakes

- Chemours' contractors Geosyntec and Parsons are implementing tasks described below that support preparing a plan outlining PFAS reductions from the facility. A PFAS reduction plan will be submitted by August 26, 2019.

Paragraphs 12b and 12c - Accelerated Reduction of PFAS Contamination in the Cape Fear River and Downstream Water Intakes

- On April 11, 2019, Chemours and its contractors submitted the final modeling scope of work document to DEQ and Cape Fear River Watch.
- Comments were addressed from Cape Fear River Watch / Southern Environmental Law Center and NCDEQ in a submittal on May 31, 2019.
- NCDEQ approved the modeling scope of work document on July 8, 2019.
- Field work supporting the reductions plan have been underway since January 2019. Field work, to date, has included identifying seeps and sampling and flow gauging of onsite seeps, creeks and Old Outfall 002. Cape Fear River water samples were also collected during this effort.
- In May and June 2019, additional field work was completed on creeks, seeps and Old Outfall 002 (one round during a dry event and one round during a wet event). Chemours' contractors Parsons and Geosyntec conducted field work to temporarily install weirs to more accurately measure flow in the seeps and Old Outfall 002.
- Additional on-site geologic mapping, characterization, and well installation field work began in June and continues.

Paragraph 12d - Accelerated Reduction of PFAS Contamination in the Cape Fear River and Downstream Water Intakes

- Assessment of the potential to achieve 80% reduction of Outfall 002 HFPO-DA and PFMOAA concentrations are being developed by Chemours' facility staff and contractor Geosyntec. Analysis will in part be informed by sampling conducted for paragraph 11c.
- Stormwater evaluation includes collection of additional stormwater grab samples to characterize stormwater runoff from the site. The first stormwater sample event was conducted on June 5, 2019.
- Additional sampling of site drainage network sediments, wastewater treatment plant samples, and soil in construction areas is ongoing, and will help inform paragraph 12 objectives.

Paragraph 12e - Accelerated Reduction of PFAS Contamination in the Cape Fear River and Downstream Water Intakes

- REGENESIS pilot study:
  - Trees were removed to facilitate the installation of performance verification monitoring wells and subsequent injections.
  - A geophysical survey was completed to determine the presence of utilities.
  - Performance verification testing monitoring points (six wells and four piezometers) were installed in April 2019. Pre-injection samples were collected from the six wells in early May (results are summarized in Attachment A-1).
  - Injections of PlumeStop were performed in early May 2019 (see Attachment A-2 for a summary of the current status of the PlumeStop pilot study, and Attachment A-3 for a summary report describing the initial findings prepared by Regenesis).
  - The first of three monthly post-injection sampling events occurred in June 2019. The results are pending.
- Chemours' contractor Parsons prepared a work plan for conducting monthly sampling at nine locations in the Old Outfall 002 channel as required by paragraph 12e.
  - Four sampling events have been completed to date (i.e., March, April, May, and June). The next sampling event is in mid-July. Results have been received for the March, April, and May sampling (summarized in the table in Attachment A-4). June data are pending.
- Old Outfall 002 Pilot Capture and Treat Testing System is operating
  - The report describing the remedial options at Old Outfall 002 was submitted on May 20, 2019.
  - Parsons prepared a preliminary design of a pilot-scale treatment system to treat water collected from Old Outfall 002 at the Option B location. The pilot treatment system incorporates batch pretreatment to remove nuisance iron and solids, followed by continuous treatment through granular activated carbon (GAC) arranged in a series of four columns to remove PFAS. The system was designed to allow treatment through two series of columns simultaneously, allowing a comparison of either pretreatment conditions (e.g., testing at two different pH values) or the type of GAC (e.g., regenerated versus virgin F400). The treatment system is located in an unused Chemours warehouse space just north of the DuPont manufacturing facility.
  - The pilot treatment started up on Friday, June 14th when the first batch of OOF2 water was treated, including aeration, pH adjustment to around 8 s.u., and settling. Following settling the water was pumped through bag filters BF-01A/01B to Batch Holding Tank T-003. Pumping through the GAC columns was then initiated and the pumping rate adjusted to provide a target flow rate of 0.11 gpm (0.42 L/min).

- Pumping has been maintained continuously through the GAC columns along the 1st train.
- Parsons developed a sampling schedule intended to (1) provide information on breakthrough of target constituents through the four columns; and (2) provide relevant pretreatment information including iron, TSS, and TOC removal.
    - In brief, Table 3+ samples (including HFPO-DA) were collected in the effluent from the 1st column each day for the first two weeks of operation and submitted for on-site analysis.
    - EPA Mod 537 MAX samples from Column 1 were collected three times per week to be submitted to TestAmerica Sacramento.
    - PFAS samples from Column 2 are being collected three times per week and from Columns 3 and 4 twice per week.
    - PFAS samples are also being collected weekly from influent and from each pretreated batch.
    - TOC samples are being regularly collected along with PFAS samples from the columns.
    - Total iron, TSS, and TOC are also being collected weekly from influent and from pretreated batch samples.

Paragraph 14 - Toxicity Studies

- Chemours responded to NCDEQ's request for additional information from contract labs on May 9, 2019.
- Toxicology lab approval was received from NCDEQ on May 29, 2019.
- NCDEQ and Cape Fear River Watch have provided comments on Chemours' draft toxicology study plan. Based on those comments, Chemours is evaluating the best method for test substance procurement, including the possibility of using in-house synthesis, external synthesis, or commercial sources.

Paragraph 16 - Groundwater Remediation

- Chemours' contractor Geosyntec prepared a scope of work document and presentations to NCDEQ and Cape Fear River Watch regarding the approach for Consent Order paragraphs 16 and 18.
- Additional well installations along Old Outfall 002, Willis Creek and Georgia Branch Creek are underway with mobilization scheduled during July.
- Temporary perched zone groundwater pumping letter and results were delivered to the State on June 17, 2019.

Paragraph 18 - On and Offsite Assessment

- Chemours' contractor Geosyntec continues to prepare the comprehensive site assessment, which will be submitted by the deadline of September 30, 2019.

Paragraphs 19 and 20 - Provision of Public Water Supplies, Whole Building Filtration Systems, and Reverse Osmosis Drinking Water Systems

- Chemours' contractors continue to install GAC whole building filtration systems and RO drinking water systems at residences. Statistics are provided in the "Replacement Drinking Water Actions" section above.

Paragraph 21 - Private Well Testing

- The step-out residential testing is underway.

Paragraph 22 - Provision of Sampling Results

- Chemours provided (and continues to provide) sampling results to DEQ and residences as required under the Consent Order.
- Chemours' contractor AECOM also prepared and transmitted level 4 lab reports for the sampling results to DEQ (and continues to do so).

Paragraph 23 - Interim Replacement of Private Drinking Water Supplies

- Chemours continues to provide interim replacement of private drinking water supplies pursuant to the Consent Order.

Paragraph 24 - Drinking Water Compliance Plan

- Chemours submitted the Drinking Water Compliance Plan on April 26, 2019.

Paragraph 26 - Total Organic Fluorine

- On May 6, 2019, Chemours submitted for approval a proposal to conduct the study.

Paragraph 27 - Fate and Transport Study

- Chemours' contractor Geosyntec prepared a fate and transport literature review and identified relevant literature papers to support development of this study. The study was submitted to NCDEQ on June 25, 2019.

Paragraph 28 - Reporting

- Chemours submitted its first quarterly report under the Consent Order on April 30, 2019.

Paragraphs 29 and 30 - Public Information

- Chemours has posted its Consent Order submissions at https://www.chemours.com/Fayetteville-Works/en-us/c3-dimer-acid/compliance-testing/index.html.

Attachment A-1

Summary of Preliminary Results for PlumeStop Phase 1 Pilot Study

Attachment A-1:
Summary of Preliminary Results
PlumeStop Phase 1 Pilot Study
Chemours Fayetteville Works
Fayetteville, North Carolina

Parameter Name	Location ID	MW-31	MW-32	MW-33	MW-34	MW-35	MW-36	MW-36
	Date	05/03/2019	05/03/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019
	Purpose	FS	FS	FS	FS	FS	FS	DUP
	Units	Result	Result	Result	Result	Result	Result	Result
VOCs (8260B)								
1,1,1,2-Tetrachloroethane	UG/L	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
1,1,1-Trichloroethane	UG/L	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
1,1,2,2-Tetrachloroethane	UG/L	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
1,1,2-Trichloroethane	UG/L	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,1-Dichloroethane	UG/L	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
1,1-Dichloroethene	UG/L	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
1,2,3-Trichloropropane	UG/L	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
1,2-Dibromo-3-Chloropropane	UG/L	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1,2-Dibromoethane (EDB)	UG/L	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
1,2-Dichloroethane	UG/L	**0.18 J**	<0.13	<0.13	<0.13	<0.13	<0.13	**0.15 J**
1,2-Dichloropropane	UG/L	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
1,3-Dichlorobenzene	UG/L	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
2-Hexanone	UG/L	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Acetone	UG/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Acetonitrile	UG/L	<9.6	<9.6	<9.6	<9.6	<9.6	<9.6	<9.6
Acrolein	UG/L	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8
Acrylonitrile	UG/L	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
Allyl Chloride	UG/L	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Benzene	UG/L	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Bromodichloromethane	UG/L	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromoform	UG/L	<0.46	<0.46	<0.46	<0.46	<0.46	<0.46	<0.46
Carbon Disulfide	UG/L	<0.17	<0.17	**0.40 B**	**0.64 B**	**0.47 B**	**0.38 B**	<0.17
Carbon Tetrachloride	UG/L	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Chlorobenzene	UG/L	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Chlorodibromomethane	UG/L	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Chloroform	UG/L	**1.6 B**	**0.19 B**	**1.7 B**	**1.0 B**	**2.0 B**	**1.5 B**	**1.5 B**

Detected constituents shown in bold type
< = not detected
J = estimated concentration
B = constituent detected in blank sample

PARSONS

Attachment A-1:
Summary of Preliminary Results
PlumeStop Phase 1 Pilot Study
Chemours Fayetteville Works
Fayetteville, North Carolina

Parameter Name	Location ID	MW-31	MW-32	MW-33	MW-34	MW-35	MW-36	MW-36
	Date	05/03/2019	05/03/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019
	Purpose	FS	FS	FS	FS	FS	FS	DUP
	Units	Result	Result	Result	Result	Result	Result	Result
Chloroprene	UG/L	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
cis-1,3-Dichloropropene	UG/L	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Dichlorodifluoromethane	UG/L	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Ethyl Chloride	UG/L	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41
Ethyl Methacrylate	UG/L	<0.86	<0.86	<0.86	<0.86	<0.86	<0.86	<0.86
Ethylbenzene	UG/L	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Iodomethane	UG/L	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
Isobutyl Alcohol	UG/L	<37	<37	<37	<37	<37	<37	<37
Meta- And Para-Xylene	UG/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Methacrylonitrile	UG/L	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Methyl Bromide	UG/L	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
Methyl Chloride	UG/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	UG/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Isobutyl Ketone	UG/L	<0.98	<0.98	<0.98	<0.98	<0.98	<0.98	<0.98
Methyl Methacrylate	UG/L	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Methylene Bromide	UG/L	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Methylene Chloride	UG/L	<0.94	<0.94	<0.94	<0.94	<0.94	<0.94	<0.94
Ortho-Xylene	UG/L	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
Propionitrile	UG/L	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7	<3.7
Styrene	UG/L	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36
Tetrachloroethene	UG/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	UG/L	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
trans-1,2-Dichloroethene	UG/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
trans-1,3-Dichloropropene	UG/L	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
trans-1,4-Dichlorobutene-2	UG/L	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Trichloroethene	UG/L	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Trichlorofluoromethane	UG/L	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29

Detected constituents shown in bold type
< = not detected
J = estimated concentration
B = constituent detected in blank sample

Attachment A-1:
Summary of Preliminary Results
PlumeStop Phase 1 Pilot Study
Chemours Fayetteville Works
Fayetteville, North Carolina

Parameter Name	Location ID	MW-31	MW-32	MW-33	MW-34	MW-35	MW-36	MW-36
	Date	05/03/2019	05/03/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019
	Purpose	FS	FS	FS	FS	FS	FS	DUP
	Units	Result	Result	Result	Result	Result	Result	Result
Vinyl Acetate	UG/L	<0.94	<0.94	<0.94	<0.94	<0.94	<0.94	<0.94
Vinyl Chloride	UG/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Xylenes	UG/L	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,4-Dioxane	UG/L	<19	<19	<19	<19	<19	<19	<19
537 Modified								
Perfluorobutane Sulfonic Acid	UG/L	<0.002	**0.0023**	<0.0020	<0.0020	**0.0024**	**0.0025**	**0.0025**
Perfluorobutanoic Acid	UG/L	**0.039**	**0.041**	**0.037**	**0.06**	**0.037**	**0.046**	**0.048**
Perfluorodecanoic Acid	UG/L	**0.0031**	**0.003**	**0.0032**	**0.0025**	**0.0031**	**0.0027**	**0.0025**
Perfluorododecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroheptanoic Acid	UG/L	**0.013**	**0.012**	**0.011**	**0.015**	**0.013**	**0.016**	**0.016**
Perfluorohexane Sulfonic Acid	UG/L	**0.003**	**0.0035**	**0.003**	**0.0029**	**0.0036**	**0.0042**	**0.0039**
Perfluorohexanoic Acid	UG/L	**0.0088**	**0.012**	**0.0078**	**0.0098**	**0.011**	**0.012**	**0.014**
Perfluorononanoic Acid	UG/L	**0.0045**	**0.0046**	**0.0061**	**0.0067**	**0.0045**	**0.0045**	**0.0046**
Perfluoropentanoic Acid	UG/L	**0.052**	**0.051**	**0.045**	**0.095**	**0.046**	**0.061**	**0.066**
Perfluoroundecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
PFOA	UG/L	**0.016**	**0.013**	**0.015**	**0.015**	**0.013**	**0.018**	**0.019**
PFOS	UG/L	**0.011**	**0.011**	**0.03**	**0.03**	**0.014**	**0.016**	**0.018**
Hfpo Dimer Acid	UG/L	**4.7**	**2.7**	**2.5**	**4.9**	**3.2**	**4.7 J**	**6.1 J**
Perfluorodecane Sulfonic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorotetradecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorotridecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
10:2 Fluorotelomer sulfonate	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
6:2 Fluorotelomer sulfonate	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Detected constituents shown in bold type
< = not detected
J = estimated concentration
B = constituent detected in blank sample

Attachment A-1:
Summary of Preliminary Results
PlumeStop Phase 1 Pilot Study
Chemours Fayetteville Works
Fayetteville, North Carolina

Parameter Name	Location ID	MW-31	MW-32	MW-33	MW-34	MW-35	MW-36	MW-36
	Date	05/03/2019	05/03/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019
	Purpose	FS	FS	FS	FS	FS	FS	DUP
	Units	Result	Result	Result	Result	Result	Result	Result
ADONA	UG/L	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
F-53B Major	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
F-53B Minor	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
N-ethyl perfluorooctane sulfonamidoacetic acid	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
N-methyl perfluorooctane sulfonamidoacetic acid	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
NaDONA	UG/L	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
Perfluorododecane sulfonic acid (PFDoS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroheptane sulfonic acid (PFHpS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorohexadecanoic acid (PFHxDA)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorononanesulfonic acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctadecanoic acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctane Sulfonamide	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentane sulfonic acid (PFPeS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Cl. Spec. Table 3 Compound SOP								
N-ethylperfluoro-1-octanesulfonamide	UG/L	<0.037 UJ	<0.037 UJ	<0.037 UJ	<0.037 UJ	<0.037 UJ	<0.037 UJ	<0.037
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	UG/L	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	UG/L	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
Byproduct 4	UG/L	**0.45**	**0.59**	**0.25**	**0.52**	**0.37**	**0.56**	**0.74 J**
Byproduct 5	UG/L	**0.87**	**1.5 J**	**0.47 J**	**0.92 J**	**1.1 J**	**1.4 J**	**1.5**
Byproduct 6	UG/L	<0.015	**0.018**	<0.015	<0.015	<0.015	<0.015	**0.016**
DFSA	UG/L	**11 J**	**23 J**	**3.1 J**	<3.1	**38 J**	**91 J**	**110 J**
EVE Acid	UG/L	<0.024	**0.028**	<0.024	<0.024	<0.024	<0.024	<0.024
Hydro-EVE Acid	UG/L	**0.08**	**0.08**	**0.047**	**0.078**	**0.057**	**0.068**	**0.081**

Detected constituents shown in bold type
< = not detected
J = estimated concentration
B = constituent detected in blank sample

Attachment A-1:
Summary of Preliminary Results
PlumeStop Phase 1 Pilot Study
Chemours Fayetteville Works
Fayetteville, North Carolina

Parameter Name	Location ID	MW-31	MW-32	MW-33	MW-34	MW-35	MW-36	MW-36
	Date	05/03/2019	05/03/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019
	Purpose	FS	FS	FS	FS	FS	FS	DUP
	Units	Result	Result	Result	Result	Result	Result	Result
MMF	UG/L	<3.6	**3.6 J**	**3.6 J**	<3.6	**3.6 J**	**3.6 J**	**3.6 J**
MTP	UG/L	**0.34**	**0.64 J**	**0.26 J**	**0.69 J**	**0.44 J**	**0.47**	**0.58 J**
N-methyl perfluoro-1-octanesulfonamide	UG/L	<0.035	<0.035 UJ	<0.035 UJ	<0.035 UJ	<0.035 UJ	<0.035	<0.035
NVHOS	UG/L	**0.71**	**1.6**	**0.57**	**1.3**	**1.2**	**1.4**	**1.5**
PEPA	UG/L	**2.6**	**1.7**	**2.1**	**3**	**1.5**	**2.3**	**2.8**
PES	UG/L	<0.046	<0.046	<0.046	<0.046	<0.046	<0.046	<0.046
PFECA B	UG/L	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
PFECA-G	UG/L	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041	<0.041
PFESA-BP1	UG/L	<0.027	**0.091**	<0.027	**0.052**	**0.04**	**0.049**	**0.041**
PFESA-BP2	UG/L	**0.78**	**0.91**	**0.45**	**0.73**	**0.5**	**0.51**	**0.54**
PFMOAA	UG/L	**56**	**121**	**40 J**	**111 J**	**80**	**98 J**	**115 J**
PFO2HxA	UG/L	**13**	**24 J**	**9.3**	**22**	**17**	**22**	**27**
PFO3OA	UG/L	**3.4**	**6**	**2.1**	**5.4**	**4.4**	**5.7**	**6.1**
PFO4DA	UG/L	**1.1**	**1.5**	**0.71**	**1.3**	**1.1**	**1.4**	**1.5**
PFO5DA	UG/L	**0.62**	**0.43**	**0.57**	**0.83**	**0.38**	**0.41**	**0.36**
PMPA	UG/L	**5.7**	**3.9**	**4.5**	**6.6**	**3.4**	**5.1**	**6.8**
PPF Acid	UG/L	**13**	**22**	**8.9**	**25 J**	**15**	**19**	**24**
R-EVE	UG/L	**0.18**	**0.19**	**0.1**	**0.2**	**0.11**	**0.16**	**0.21**
Misc.								
Total Calcium (6010D)	MG/L	**3.8**	**6**	**3.9**	**1.1 B**	**3.3**	**2.7**	**2.8**
Dissolved Calcium (6010D / Filtered)	MG/L	**3.5**	**5.7**	**3.6**	**1**	**2.7**	**2.5**	**2.6**
Total Organic Carbon (9060)	MG/L	**1.4**	**1.6**	**1.3**	**1.2**	**1.2**	**1.3**	**1.3**
Dissolved Organic Carbon (9060 / Filtered)	MG/L	**1.5**	**2**	**1.2 B**	**1.2 B**	**1.4**	**1.4**	**1.4**
Total Hardness As CaCO3 (2340 C-1997)	MG/L	**13**	**21**	**11**	**4.4**	**11**	**7.1 J**	**13 J**

Detected constituents shown in bold type
< = not detected
J = estimated concentration
B = constituent detected in blank sample

Attachment A-2

PlumeStop Update and Figure

PlumeStop® Liquid Activated Carbon™ Pilot Study Update

Prior to beginning the pilot study, Parsons completed a hydrogeologic assessment in this area to locate the perched zone and collect samples for bench scale testing. As part of this assessment, a number of monitoring wells were installed to be used as performance monitoring wells for the PlumeStop application. As described in the May 2019 Remedial Options Plan prepared by Parsons, the pre-pilot study drilling project included the installation of soil borings (to map out the location of the perched zone clay), 6 monitoring wells, and 4 piezometers. The hydrogeologic assessment was completed between April 9 and April 23, 2019.

Samples from the aquifer matrix (soil and groundwater) were also collected and shipped to REGENESIS for bench scale testing. The bench scale testing is nearly complete. The results of the bench scale testing will be incorporated into the final pilot study report to be submitted to NCDEQ by September 30, 2019 as required by Paragraph 12.e of the consent order.

The hydrogeologic information was then reviewed by REGENESIS Remediation Services (RRS) prior to mobilization to the site. Based on groundwater elevations collected by Parsons, REGENESIS constructed a groundwater flow map showing the general groundwater flow direction to be rotated approximately 45 degrees from the longest side of the proposed barrier. Following this and taking into consideration the fixed locations of the performance monitoring wells, REGENESIS established an injection pattern as described in the attached Summary Report prepared by REGENESIS. Injection points (IP) were placed in three rows. RRS mobilized product, injection equipment, and personnel to the Site to begin work over nine days on May 7th through May 17th, 2019. General components of the pilot study included the installation of temporary monitoring wells, collection and analyses of pre- and post-application soil borings, design verification testing, and application of PlumeStop® at a total of 48 discrete injection locations. Throughout the application, water levels and reagent concentrations in monitoring wells were measured to ascertain the influence of remedial injections. After the application, RRS flushed the permanent monitoring wells that were influenced with clean water to minimize particulate buildup resulting from injections.

The six monitoring wells were sampled in early May prior to the PlumeStop® injections and the first of three planned monthly post-injection sampling events was conducted in June 2019. The results of the pre-injection sampling are attached. The June sampling results have not yet been received.

N

Approximate Location of Proposed
Perched Zone Treatment Barrier (Phase 1)

PZ-31
PZ-32
MW-31
SB-202
MW-32
MW-34
MW-33
MW-35
MW-36
SB-203
PZ-33
PZ-34

0 30 60 120 Feet

Pilot Study Proposed Locations

Proposed Perched Zone Treatment Barrier

PARSONS

Parsons Environment & Infrastructure
4701 Hedgemore Dr.
Charlotte, NC 28209

Regenesis PlumeStop Performance Verification Testing
Old Outfall 002 Remedial Options Plan
Fayetteville Works Facility
Fayetteville, North Carolina

Drawn: C. Oneal	Date: 5/14/2019	File Project Number: 449338.01050
Revision: 1	Figure Number: 4	
Name: RegenesisVerification_v2		

D:\GIS\Fayetteville\GIS\Project_figures\2019\Regenesis\Verification_v2.mxd

Attachment A-3

Regenesis Application Summary Report for the Perched Zone Pilot Study

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

June 14, 2019

REGENESIS Proposal No. DaP62230

The Chemours Company FC, LLC
ATTN: Sebastian Bahr
1007 Market Street, D-3084
Wilmington, DE 19899

SUBJECT: Summary Report for the Perched Zone Pilot Study at the Fayetteville Works Site

Sebastian,

REGENESIS Remediation Services (RRS) has recently completed the first of two planned pilot studies of *in situ* injections utilizing PlumeStop® Liquid Activated Carbon™ (PlumeStop) for the treatment of the contaminants perfluoro-2-methoxyacetic acid (PFMOAA) as well as GenX and its derivatives including hexafluoropropylene oxide dimer acid (HFPO-DA) at the Fayetteville Works Site (Site) located at 22828 NC-87 in Fayetteville, North Carolina. In this Phase 1 pilot study, a "proof of concept" barrier was installed in a perched aquifer (Perched Zone Area) at the Site. During Phase I, further site-specific data were gathered in order to optimize the sorption-based treatment designs for the perched zone, the surficial aquifer barrier of Phase II, and future large-scale applications.

RRS mobilized product, injection equipment, and personnel to the Site to begin work over nine days on May 7th through May 17th, 2019. RRS staffed the project with experienced personnel who ensured a safe, successful injection application. General components of the pilot study included the installation of temporary monitoring wells, collection and analyses of pre- and post-application soil borings, design verification testing, and application of PlumeStop at a total of 48 discrete injection locations. Throughout the application, water levels and reagent concentrations in monitoring wells were measured to ascertain the influence of remedial injections. After the application, RRS flushed the permanent monitoring wells that were influenced with clean water to minimize particulate buildup resulting from injections.

For complete details of the study, please review the attached application summary page, injection layout, soil boring logs, photo log, injection logs, and water level monitoring log.

RRS appreciates the opportunity to work at the Site with The Chemours Company. RRS will be available to interpret the field data as it is collected and answer any questions. If you need additional information regarding the application process or attached documents, please contact Steve Barnes at 574.349.0650 or Tyler Harris at 404.809.8807.

Sincerely,

Steve Barnes
RRS Operations Manager
REGENESIS Remediation Services

Tyler Harris
Field Project Manager
REGENESIS Remediation Solutions

cc: Chad Northington (CNorthington@Regenesis.com); Doug Davis (DDavis@Regenesis.com); Dave Peterson (DPeterson@Regenesis.com); Scott Wilson (SWilson@Regenesis.com); Tony Boever (TBoever@Regenesis.com)

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

Perched Zone Pilot Study Summary Page

OVERVIEW

Client: The Chemours Company
Client PM: Sebastian Bahr
RRS Project Manager: Steve Barnes
RRS Project Supervisor: Tyler Harris

Site Address: 22828 NC-87, Fayetteville, NC 28306
Project Name: Fayetteville Works Site
Perched Zone Pilot Study
Project Dates: 5/7/2019-5/17/2019

TREATMENT TECHNOLOGY

The treatment approach for the Perched Zone Pilot Study at the Fayetteville Works Site followed *in situ* sorption using the REGENESIS product PlumeStop to partition PFMOAA and HFPO-DA contamination in perched groundwater out of the dissolved phase. PlumeStop is a colloid of micro-milled activated carbon with a particle size of 1-2 µm suspended in water using unique organic polymer chemistry. After initial injections, the unique chemistry allows for distribution of PlumeStop through soil pore throats and deposition onto soil surfaces. Once deposition of the colloidal activated carbon onto soil occurs, PlumeStop effectively treats contaminated groundwater by providing a high surface area matrix for sorption of contaminants. PlumeStop is effective at removing a wide range of contaminants from groundwater, including refractory compounds such as the fluoroethers at the Site.

RRS conducted design verification testing (DVT) activities as outlined in the proposal dated May 3rd, 2019, with the results supplementing the conceptual design and installation of the Perched Zone Area barrier for Phase 1 of the pilot studies. Design modifications were necessitated from both the DVT work and review of hydrogeologic information submitted by Parsons immediately prior to mobilization.

PHASE I PILOT STUDY AREA

The Perched Zone Area of Phase I is located near the polyvinyl fluoride resin manufacturing unit at the Fayetteville Works manufacturing site. Situated near an outfall channel, the area itself is relatively flat and is adjacent to a moderately steep ravine to the west-southwest. The Phase I pilot test was conducted to assess PlumeStop treatment near the southwestern extent of the perched zone which is a relatively thin saturated, sandy zone atop a clay unit starting at approximately 16 to 22 feet below ground surface (bgs). The saturated thickness of the perched zone varies from 5 to 9 feet, approximately, in the pilot test area. The area previously contained a stand of coniferous trees, which was cleared prior to the arrival of RRS. The area also includes a series of permanent monitoring wells located both within and outside the surficial extent of the injection barrier.

Prior to mobilization, Parsons completed a hydrogeologic assessment in this area to locate the perched zone. As part of this assessment, a number of monitoring wells were installed to be used as performance

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

monitoring wells for the PlumeStop application. Hydrogeologic information was reviewed immediately prior to mobilization. Based on groundwater elevations collected by Parsons, REGENESIS constructed a groundwater flow map showing the general groundwater flow direction to be rotated approximately 45 degrees from the longest side of the proposed barrier. Following this and taking into consideration the fixed locations of the performance monitoring wells, REGENESIS established an injection pattern as shown in *Figure 1* and Appendix A: Injection Layout. Injection points (IP) were placed in three rows, with Rows 1 and 2 numbered 1-32 and in the upgradient portion of the barrier and Row 3 numbered 33-48 and located in the downgradient side of the barrier.

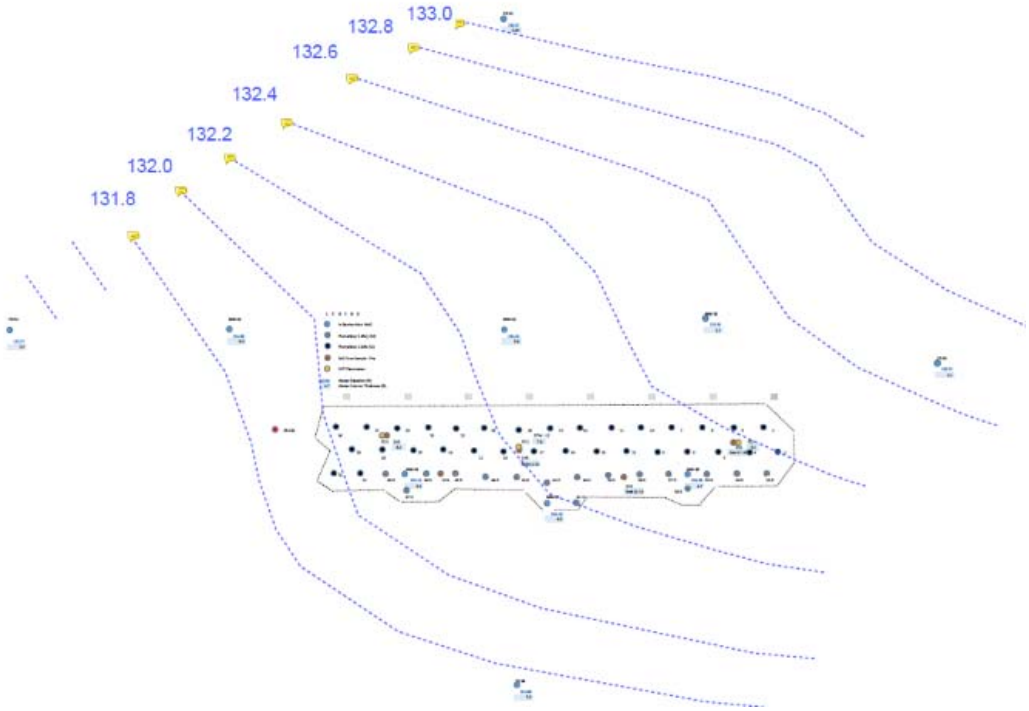


Figure 1. Potentiometric groundwater flow map for the Phase 1 Pilot Test Area. (Contour intervals at 0.2 feet).

DESIGN VERIFICATION TESTING

Prior to and during the pilot-scale PlumeStop barrier application, a DVT was conducted to refine the Perched Zone treatment design. A total of 11 soil borings, five pre-application and six post-application cores were collected throughout the study. Soil borings were retrieved in 5-foot sections using a 2.25-inch dual-tube sampler and ranged in total collection depths of 20 to 23 feet below ground surface (ft bgs). Cores were logged in detail from eight feet below ground surface to the end of the boring (Appendix B: Soil Boring Logs). Special emphasis was placed on measuring the vertical saturated thickness and observing the perched zone sand/cay contact across the length of the barrier, which established the target vertical treatment positionally in the barrier. Soil grain size, which was used to predict hydraulic conductivity and potential radius of influence (ROI) of the treatment, was observed through soil settling analysis, whereby soil samples collected in 1-foot increments were placed in glass vials with water, mixed, and allowed to settle by particle size into distinct layers (*Figure 2*; Appendix C: Photo Log).

REGENESIS REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

Figure 2. DV-1 soil settling tubes from 10 ft bgs (far left) to 20 ft bgs (far right) depicting the abrupt change from light tan sand (10-13 ft bgs) to light gray silty sand (13-17 ft bgs) to orange-brown clay beginning at 16.3 ft bgs. Complete boring log located in Appendix B: Soil Boring Logs.

The lithology of the perched zone was predominantly sand and silty sand with varying degrees of fines. Two fine-grained (silt/clay) layers were noted in all soil borings. A thin fine-grained layer, two to eight inches thick was observed approximately between 11 and 13 ft bgs. The aquiclude of the perched aquifer was determined to begin at between 16 and 21 ft bgs, increasing in depth from the SSE to NNW. Water was encountered beginning at 11 to 12 ft bgs and extended into the confining layer. The saturated thickness in the western portion of the barrier was greater than what was expected based on the review of available data including previous boring logs. The increase in the total vertical treatment increased the treatment volume by approximately 20 percent from the original design calculations, and as a result, REGENESIS expedited the shipment of 2,000 lbs of additional PlumeStop to compensate for the increase.

The first of the pre-application borings (DVs 1 & 2) were collected in the eastern side of the barrier where the saturated thickness was expected to be smallest. Prior to injections, three temporary piezometers (PZs 1-3) were installed and used as an ROI indicator and to improve the spatial sampling resolution of water level measurements. To observe the effect on water levels in nearby wells, injections began with a single-point injection test at IP-1. During the test, wells were observed for changes in depth to water (DTW) and arrival of the PlumeStop reagent. Additionally, pressures and flowrates were varied to identify any lithological limitations of injections (Appendix D: Injection Log – Table 1, IP-1). During the application, soil borings were advanced and soil color observed for the vertical distribution of the PlumeStop reagent.

On visual inspection of the post-application borings, the vertical distribution of the PlumeStop solution was demonstrated by gray to black coloration of the sediments (Appendix C: Photo 7). Semi-quantitative results of PlumeStop distribution were obtained from colorimetric analyses of sediments using the Munsell color system in which clear color changes were measured from nine feet below ground surface to the beginning of the confining layer. Prominent PlumeStop bands, generally 2 to 12 inches thick were observed at various depths in the cores. RRS assessed vertical distribution of PlumeStop utilizing several injection delivery methods (discussed below).

APPLICATION

A total of 48 discrete locations were utilized to deliver the remedial solution of PlumeStop to the subsurface of the treatment area. Using direct-push technology (DPT), PlumeStop was injected through 2.25-inch tooling. Injection points were placed in a staggered grid-like pattern of three rows with an average spacing of five feet between points and rows. Treatment depths and intervals varied based on the saturated thickness of the perched aquifer. For all locations, the bottom of the TTZ was located at the

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

perched water table-aquiclude interface. As such, bottom treatment depths increased from 17 to 22 ft bgs along the barrier from the SSE to the NNW while the treatment interval increased from six to nine feet.

Initial injections were completed following a bottom-up approach using 3-foot retractable screens to deliver the PlumeStop reagent to the subsurface in discrete intervals of 1-3 feet (i.e., an injection from 22-20 ft bgs was completed before lifting tooling three feet to inject in the 20-17 ft bgs interval). In addition to retractable screens, injections were attempted using pressure-activated probes which discharge fluid in a narrow band from four injection ports. These probes were utilized in 6-inch intervals following bottom-up and top-down approaches. Lastly, 3-foot retractable screens were attempted in small, 1-foot intervals following top-down and bottom-up approaches. Based on visual inspection of PlumeStop distribution in the post-application cores corresponding to the aforementioned methods, 3-foot screens following a bottom-up approach of 3-foot intervals was determined to be the best delivery method.

With the exception of high-pressure tooling (e.g., pressure-activated probes), injection pressures were relatively low, remaining under 50 pounds per square inch (psi). The median pressure for all points, regardless of tooling, was 18 psi. Aside from a pressure of 80 psi in the bottom injection interval at IP-9, pressures above 50 psi were observed at locations where pressure-activated probes were used as well as where retractable screens following a top-down approach were used, which resulted in clogged screens caused by back-pressure. Back-pressure was noted in some areas and appeared to increase as the injection volume to a particular area increased.

To test injection limitations, flowrates were varied from 0.50 to 10.05 gallons per minute (gpm) for an overall median flowrate of 4.31 gpm. Based on the lithology and injection tooling diameter, flowrates appeared to be limited to a maximum of 5.50 gpm, whereby higher rates resulted in surfacing from around the active boring. Surfacing was otherwise uncommon and successfully prevented or mitigated by decreasing flowrates to 4.0 gpm or lower; lower rates were required as the application neared completion.

REGENESIS' design for the Perched Zone Area included two primary design types, termed "Rows 1 & 2" and "Row 3", with a total of five unique per point target volumes injected at three different concentrations (Table 1). For Rows 1 & 2 (IPs 1-32), PlumeStop was injected at 30,000 ppm, whereas IPs 33-44 of Row 3 received a solution of 13,500 ppm, and IPs 45-48 of Row 3 was injected at 10,541 ppm. During injections, all nearby monitoring wells were monitored for water table fluctuations and the presence of PlumeStop (Table 2; Appendix E: Water Level Measurements). Bailed samples were semi-quantitatively measured colorimetrically, with the upper limit of PlumeStop concentrations in MWs 34-36 and PZs 1-3 ranging from 3,000 to 30,000 ppm. To prevent particulate buildup in affected wells, MWs 34-36 were flushed with clean water after injections were completed. The temporary piezometers were removed and abandoned with bentonite.

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

TREATMENT AREA SUMMARY

ROWS 1 & 2

9,200 pounds of PlumeStop were mixed with hydrant water and diluted to a 30,000 ppm solution. A total of 7,351 gallons of the PlumeStop solution was injected.

Application Method: 2.25-inch direct-push tooling following top-down and bottom-up approaches.
Injection Tooling: 3-foot retractable screens and pressure-activated probes.
Injection Depths: 22-10 ft bgs – varied by injection point based on saturated thickness; *see Appendix D: Injection Logs, Table 1 for details.*
Number of Injection Points: 32
Deviations from Proposal:

1. Injection volume for IP-12 applied in 18-15 ft bgs interval due to volume calculation error.
2. Volume of IP-31 and IP-32 combined from 22-16 ft bgs at IP-32 due to surfacing-related abandonment of IP-31 resulting from alternate delivery method; separate contingency point not utilized due to the proximity of potential locations to IPs 31 and 32.

Please see Table 1 of Appendix D for details on injection flowrates and pressures observed.

ROW 3

12,800 pounds of PlumeStop were mixed with hydrant water and diluted to 13,500 ppm (IPs 33-44) and 10,541 ppm (IPs 45-48) solutions. A total of 4,867 gallons of the PlumeStop solution was injected.

Application Method: Direct-push injection following bottom-up approach
Injection Tooling: 3-foot retractable screens
Injection Depth: 22-11 ft bgs – varied by injection point based on saturated thickness; *see Appendix D: Injection Logs, Table 2 for details*.
Number of Injection Points: 16
Deviations from Proposal: None

Please see Table 2 of Appendix D for details on injection flowrates and pressures observed.

SUMMARY

For this initial phase pilot test, design verification testing and installation of a PlumeStop barrier were completed in the Perched Zone at the Fayetteville Works Site. The sorption-based technology of PlumeStop was implemented in the REGENESIS design to treat the target contaminants PFMOAA and HFPO-DA in groundwater of a perched aquifer located adjacent to the southern boundary of the Fayetteville Works manufacturing site in Fayetteville, North Carolina. The *in situ* application of PlumeStop at a total of 48 locations created a barrier 70 feet in length. A total of 22,000 lbs of PlumeStop was injected via direct-push technology for a total application volume of 12,218 gallons.

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

Table 1: Treatment design details for the Perched Zone Pilot Study Area.

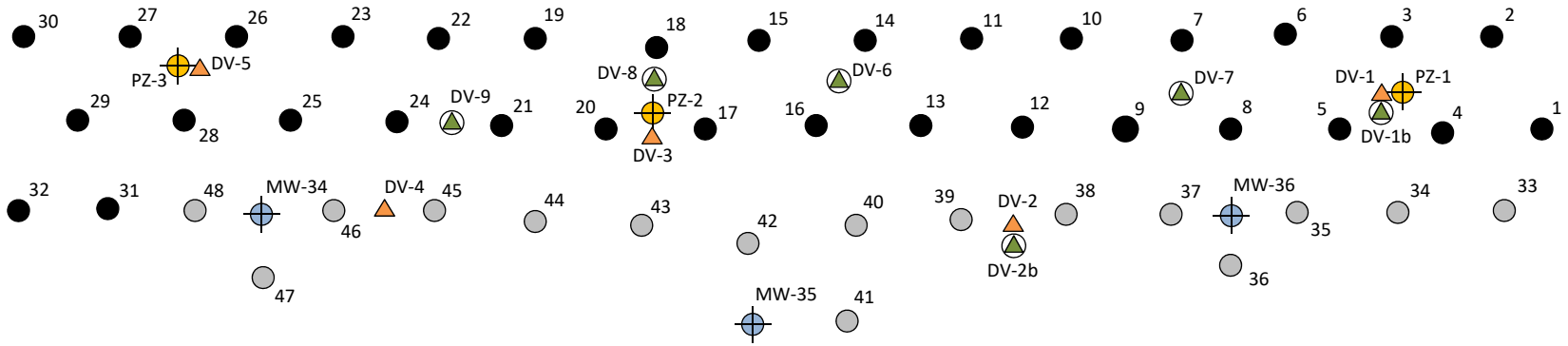
Design Name	Injection Point Number	TTZ Thickness (vertical feet)	Injection Concentration (ppm)	Target per Point Volume (gal)	Actual per Point Volume (gal) - mean
Rows 1 & 2	1-16	6	30,000	188	183 ± 8
	17-22	8	30,000	250	240 ± 38
	23-32	9	30,000	281	300 ± 26
Row 3	33-39	6	13,500	284	285 ± 16
	40-44	8	13,500	284	281 ± 22
	45-48	9	10,541	364	366 ± 21

Table 2: Depth to water and PlumeStop concentrations measured at the six primary wells during injections.

Monitoring Well	Well Type	|Δ DTW| (absolute feet)	Max PlumeStop Concentration (ppm)
MW-34	Permanent	2.00	9,550
MW-35		1.35	29,250
MW-36		5.74	30,050
PZ-1	Temporary	1.98	3,050
PZ-2		1.56	21,550
PZ-3		1.24	21,050

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

APPENDIX A – Injection Layout



PLUME STOP Liquid Activated Carbon	**Prepared By:** *Tony Boever*	**Injection Layout** **Perched Zone Pilot Study Area** **Fayetteville Works Site** **Fayetteville, North Carolina**	**Date Prepared:** *May 2019*

REGENESIS REMEDIATION SERVICES
Technology-Based Solutions for the Environment

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

APPENDIX B – Soil Boring Logs:

Pre-application cores: DVs 1, 2, 3, 4, 5

Post-application cores: DVs 1b, 2b, 6, 7, 8, 9

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Design Verification, Perched Zone Pilot Study - Fayetteville Works Site - Fayetteville, NC
5/8/2019
Boring DV-1

Depth	Time	Physical				Grain Size Info.					Moisture			Contact		Soil Classification	Comments
(ft.)	Time	Recovery	Penetrometer	Pre-app Munsell	Post-app Munsell (DV-1b)	Fines%	Sand%	Fine Sand	Med Sand	Coarse S	Dry	Moist	Wet	Sharp	Gradation	Name	
0-8	St-9:30		--	--	-	--	--	--	--	--	X			--	--	--	Silt Loam to 1.2 ft, then sandy silt to 8 ft.
8		100	2.25	--	-	10	90	X			X					Sand, some silt	
9		100	<0.5	--	-	60	40	X			X					Silt and Sand	
10		100	<0.5	--	GLEY 1 4/N	40	60	X			X					Silt and Sand	
11		100	1.5	10YR 7/2	2.5Y 6/2	20	80	X					X			Silty Sand	Silt Zone 10.8 - 11.1, wet at ~11.2
12		100	<0.5	10YR 7/1	GLEY 1 2.5/N	65	35	X					X			Sandy Silt	
13		100	0.5	10YR 7/1	GLEY 1 2.5/N	55	45	X					X			Silt and Sand	
14		100	<0.5	10YR 7/1	2.5Y 6/1	25	75	X					X			Silty Sand	
15		100	<0.5	10YR 7/1	5Y 6/1	35	65	X	X				X			Silty Sand	Sand Coarsens b/t 15-16 ft- Medium
16		100	<0.5	10YR 7/1	5Y 7/1+	30	70	X					X	X (16.3)		Clay	Clay at 16.3
17		100	0.5	10YR 6/6	-	100						X	X			Clay	
18		100	1	10YR 6/4	-	100						X	X			Clay	
19		50	1	10YR 6/6	-	100						X	X			Clay	No recovery 19.5-20.0'
20		EOB	EOB	--	-	--	--	--	--	--	--	--	--	--	--	--	20' = End of Boring
				End of boring at 20 ft. Abandoned with bentonite.													blue shaded = target wet (perched zone) sand interval

REGENESIS REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Design Verification, Perched Zone Pilot Study - Fayetteville Works Site - Fayetteville, NC
5/8/2019
Boring DV-1

Depth	Time	Physical				Grain Size Info.					Moisture			Contact		Soil Classification	Comments
(ft.)	Time	Recovery	Penetrometer	Pre-app Munsell	Post-app Color (DV-7)	Fines%	Sand%	Fine Sand	Med Sand	Coarse S	Dry	Moist	Wet	Sharp	Gradation	Name	
0-8	St-9:30		--	--	-	--	--	--	--	--	X			--	--	--	Silt Loam to 1.2 ft, then sandy silt to 8 ft.
8		100	2.25	--	-	10	90	X			X					Sand, some silt	
9		100	<0.5	--	GLEY 1 4/N	60	40	X			X					Silt and Sand	
10		100	<0.5	--	2.5Y 5/2	40	60	X			X					Silt and Sand	
11		100	1.5	10YR 7/2	2.5Y 5/1	20	80	X					X			Silty Sand	Silt Zone 10.8 - 11.1, wet at ~11.2
12		100	<0.5	10YR 7/1	2.5Y 7/2	65	35	X					X			Sandy Silt	
13		100	0.5	10YR 7/1	2.5Y 6/1	55	45	X					X			Silt and Sand	
14		100	<0.5	10YR 7/1	GLEY 1 2.5Y/N	25	75	X					X			Silty Sand	
15		100	<0.5	10YR 7/1	GLEY 2 3/5PB	35	65	X	X				X			Silty Sand	Sand Coarsens b/t 15-16 ft- Medium
16		100	<0.5	10YR 7/1	2.5Y 7/1	30	70	X					X	X (16.3)		Clay	Clay at 16.3
17		100	0.5	10YR 6/6	GLEY 2 3/5PB	100						X	X			Clay	
18		100	1	10YR 6/4	GLEY 1 5/N	100						X	X			Clay	
19		50	1	10YR 6/6	GLEY 1 2.5/10Y	100						X	X			Clay	No recovery 19.5-20.0'
20		EOB	EOB	--	-	--	--	--	--	--	--	--	--	--	--	--	20' = End of Boring
				End of boring at 20 ft. Abandoned with bentonite.													blue shaded = target wet (perched zone) sand interval

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Design Verification, Perched Zone Pilot Study - Fayetteville Works Site - Fayetteville, NC
5/8/2019
Boring DV-2

Depth	Time	Physical				Grain Size Info.					Moisture			Contact		Soil Classification	Comments
(ft.)	Time	Recovery	Penetrometer	Pre-app Munsell	Post-app Munsell (DV-2b)	Fines%	Sand%	Fine Sand	Med Sand	Coarse S	Dry	Moist	Wet	Sharp	Gradation	Name	
0-10	St-14:00		--	--	-	--	--	--	--	--	X			--	--	--	Silt Loam to 1.2 ft, then sandy silt to 10 ft. No Recovery 2.5 - 5' and 9-10'
8		50	0.5	--	-	--	--	--	--	--	X					Sandy Silt	
9		0	--	--	GLEY 1 4/N	--	--	--	--	--	--					No Recovery	
10		100	2.75	10YR 6/2	2.5Y 5/1	75	25	X			X					Sandy Silt	Sandy Silt
11		100	1.5	10YR 6/1	GLEY 1 5/N	75	25	X			X					Sandy Silt	
12		100	2	10YR 7/1	2.5Y 6/2	80	20	X				X	X			Sandy Silt	Becoming moist, then wet starting at ~12 ft
13		100	<0.5	10YR 6/3	2.5Y 6/2	5	95	X					x			Sand	Sand
14		0	--	--	GLEY 1 2.5Y/N	--	--	--	--	--	--		--			No Recovery	
15		100	0.5	10YR 7/1	5YR 4/10	30	70	X					X			Silty Sand	Silty Sand
16		100	<0.5	10YR 7/1	2.5Y 6/6	30	70	X	X				X			Silty Sand	
17		100	<0.5	10YR 7/1	10YR 5/4	30	70	X					X			Silty Sand	
18		100	1	10YR 6/6	10YR 6/2	100						X	X	X (18')			Silty Clay (approx 20% silt)
19		100	<0.5	10 YR 6/4	GLEY 2 3/5PB	100						X	X				
20		EOB	EOB	--	-	--	--	--	--	--	--	--	--	--	--	--	20' = End of Boring
				End of boring at 20 ft. Abandoned with bentonite.													blue shaded = target wet (perched zone) sand interval

REGENESIS REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Design Verification, Perched Zone Pilot Study - Fayetteville Works Site - Fayetteville, NC
5/9/2019
Boring DV-3

Depth	Time	Physical				Grain Size Info.					Moisture			Contact		Soil Classification	Comments
(ft.)	Time	Recovery	Penetrometer	Pre-app Munsell	Post-app Munsell (DV-6)	Fines%	Sand%	Fine Sand	Med Sand	Coarse S	Dry	Moist	Wet	Sharp	Gradation	Name	
0-8	St-16:00		--	--	-	--	--	--	--	--	X			--	--	--	Sand Loam to 1.5 ft, then sandy silt to 7.2 ft (no Recovery 3.2 - 5'), then sand. Top 8 ft is all dry, mostly stiff
8		100	<0.5	-	-	--	--	--	--	--	X					Sand	
9		20	<0.5	--	GLEY 1 3/N	--	--	--	--	--	X					Sand	No recovery 9.2-10'
10		100	<0.5	10YR 7/2	GLEY 1 5+/N	10	90	X			X					Sand	
11		100	1.5	10YR 7/1	2.5Y 6/1	60	40	X			X					Silt and Sand	
12		100	0.5	10YR 7/2	2.5Y 6/2	10	90	X				X	X			Sand	Becoming moist, then wet starting at ~12 ft
13		100	2.5	10 YR 6/2	GLEY 1 2.5/N+	5	95	X					X			Sand	@13-13.2 and at 13.8-14 silt, sand and clay, stiff
14		--	1.5	--	GLEY 1 2.5/N+	--	--	--	--	--	--	--	--			No Recovery	No recovery 14-15'
15		100	<0.5	10 YR 7/1	GLEY 1 3/N	30	70	X					X			Silty Sand	
16		100	<0.5	10 YR 7/1	GLEY 2.5/N	40	60	X					X			Silty Sand	Pronounced sat zone 16.5-17.2 ft
17		100	<0.5	10 YR 7/1	GLEY 1 4/N	30	70	X					X			Silty Sand	
18		100	<0.5	10 YR 7/1	GLEY 1 4/N	5	95	X					X			Sand	Pronounced sat zone 18.5-19.1 ft
19		100	<0.5	10 YR 7/1 --> 5/6 @19.5'	GLEY 1 3/N	10	90	X					X	X (19.5')			
20		EOB	EOB	--	2.5Y 5/6	--	--	--	--	--	--	--	--	--	--	--	20' = End of Boring
				End of boring at 20 ft. Abandoned with bentonite.													blue shaded = target wet (perched zone) sand interval

REGENESIS REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Design Verification, Perched Zone Pilot Study - Fayetteville Works Site - Fayetteville, NC
5/9/2019
Boring DV-3

Depth	Time	Physical				Grain Size Info.					Moisture			Contact		Soil Classification	Comments
(ft.)	Time	Recovery	Penetrometer	Pre-app Munsell	Post-app Munsell (DV-8)	Fines%	Sand%	Fine Sand	Med Sand	Coarse S	Dry	Moist	Wet	Sharp	Gradation	Name	
0-8	St-16:00		--	--	-	--	--	--	--	--	X			--	--	--	Sand Loam to 1.5 ft, then sandy silt to 7.2 ft (no Recovery 3.2 - 5'), then sand. Top 8 ft is all dry, mostly stiff
8		100	<0.5	-	-	--	--	--	--	--	X					Sand	
9		20	<0.5	--	-	--	--	--	--	--	X					Sand	No recovery 9.2-10'
10		100	<0.5	10YR 7/2	2.5Y 6/1	10	90	X			X					Sand	
11		100	1.5	10YR 7/1	2.5Y 6/1	60	40	X			X					Silt and Sand	
12		100	0.5	10YR 7/2	2.5Y 6/1	10	90	X				X	X			Sand	Becoming moist, then wet starting at ~12 ft
13		100	2.5	10 YR 6/2	GLEY 1 2.5+/N	5	95	X					X			Sand	@13-13.2 and at 13.8-14 silt, sand and clay, stiff
14		--	1.5	--	2.5Y 5/1	--	--	--	--	--	--	--	--			No Recovery	No recovery 14-15'
15		100	<0.5	10 YR 7/1	2.5Y 5/1 (20% recovery 15-20 ft bgs)	30	70	X					X			Silty Sand	
16		100	<0.5	10 YR 7/1		40	60	X					X			Silty Sand	Pronounced sat zone 16.5-17.2 ft
17		100	<0.5	10 YR 7/1		30	70	X					X			Silty Sand	
18		100	<0.5	10 YR 7/1		5	95	X					X			Sand	Pronounced sat zone 18.5-19.1 ft
19		100	<0.5	10 YR 7/1 --> 5/6 @19.5'		10	90	X					X	X (19.5')			
20		EOB	EOB	--		--	--	--	--	--	--	--	--	--	--	--	20' = End of Boring
				End of boring at 20 ft. Abandoned with bentonite.													blue shaded = target wet (perched zone) sand interval

REGENESIS REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Design Verification, Perched Zone Pilot Study - Fayetteville Works Site - Fayetteville, NC
5/9/2019
Boring DV-4

Depth	Time	Physical				Grain Size Info.					Moisture			Contact		Soil Classification	Comments
(ft.)	Time	Recovery	Penetrometer	Pre-app Munsell	Post-app Munsell (DV-9)	Fines%	Sand%	Fine Sand	Med Sand	Coarse S	Dry	Moist	Wet	Sharp	Gradation	Name	
0-8'	St-14:20		--	--		--	--	--	--	--	X			--	--	--	Sand Loam to 1.5 ft, then silt and sand. Top 10 ft is all dry, mostly stiff/dense.
					GLEY 1 2.5/N												
10		100	0.75	10 YR 6/4	GLEY 1 3/N	30	70	X			X					Silty Sand	
11		100	1	10 YR 6/1	GLEY 1 3/N	10	90	X			X					Sand	
12		100	2.25	10 YR 6/1	10YR 7/1	20	80	X					x (12.5')			Silty Sand	
13		100	0.75	10 YR 6/4	10YR 6/2	20	80	X					X			Silty Sand	
14		20	<0.5	--	GLEY 1 2.5/N	--	--	--					X			--	No recovery 14.2-15 ft
15		100	<0.5	10 YR 7/1	10YR 7/1	10	90	X					X			Sand	
16		100	<0.5	10 YR 7/1	GLEY 1 5/N	10	90	X					X			Sand	
17		100	<0.5	10 YR 6/1	10YR 7/1	30	70	X					X			Silty Sand	
18		100	<0.5	10 YR 7/1	GLEY 1 2.5/N	5	95	X					X			Sand	
19		100	<0.5	10 YR 6/1->5/4	-	5/100	95/0	X/'--					X	X (19.2')			@19.2 ft - Sand to Clay contact, lt gray to gray/brown
20		EOB	EOB	--	-	--	--	--	--	--	--	--	--	--	--	--	20' = End of Boring
				End of boring at 20 ft. Abandoned with bentonite.													blue shaded = target wet (perched zone) sand interval

REGENESIS REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Design Verification, Perched Zone Pilot Study - Fayetteville Works Site - Fayetteville, NC
5/9/2019
Boring DV-5

Depth	Time	Physical			Grain Size Info.					Moisture			Contact		Soil Classification	Comments
(ft.)	Time	Recovery	Penetrometer	Munsell	Fines%	Sand%	Fine Sand	Med Sand	Coarse S	Dry	Moist	Wet	Sharp	Gradation	Name	
0-8	St-16:00		--	--	--	--	--	--	--	X			--	--	--	Sand Loam to 2.2 ft, then silt and sand to 7 ft, fine sand and silt to 10 ft, top 10 ft is all dry, mostly stiff/dense
8		100	1	--	--	--	--	--	--	X			--	--	--	
9		50	<0.5	--	--	--	--	--	--	X			--	--	--	
10		100	<0.5	10 YR 4/2	10	90	X			X					Sand	Sand
11		100	<0.5	10 YR 7/4	0	100	X			X					Sand	
12		100	2	10 YR 6/2	70	30	X				X	X (12.7')			Silty Sand	Silt zone, stiff - 12-12.7, increasing moisture
13		25	<0.5		10	90	X	X				X			Sand	
14		--	--	--	--	--	--	--	--	--	--	--			--	No recovery 14-15'
15		100	<0.5	10 YR 7/1	5	95	X					X			Sand	
16		100	<0.5	10 YR 7/1	10	90	X					X			Sand	
17		100	<0.5	10 YR 7/1	30	70	X					X			Silty Sand	
18		100	<0.5	10 YR 7/1	30	70	X					X			Silty Sand	
19		50	<0.5	--	--	--	--	--	--	--	--	X			--	
20		100	<0.5	10 YR 5/2	5	95						X			Sand	@20.8 - contact, sand to clay
21		100	<0.5	10 YR 5/3	100	0					X	X			Clay, some silt	
22		30	<0.5	--	--	--					X	X			Clay, some silt	
23		EOB	EOB	--	--	--	--	--	--	--	X	X	--	--	--	23' = End of Boring
				End of boring at 20 ft. Abandoned with bentonite.												blue shaded = target wet (perched zone) sand interval

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

APPENDIX C – Photo Log

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

Photo Log: Perched Zone Pilot Study Area at the Fayetteville Works Site

Photo 1: Perched Zone Pilot Study prior to the PlumeStop application. MW-35 pictured in center.

Photo 2: Staging area for RRS equipment, water, and product.

Photo 3: Product delivery area.

Photo 4: Hydrant water source located along the truck delivery route for Fayetteville Works.

Photo 5: Layout of injection locations. MW-34 pictured in foreground.

Photo 6: Core sections of DV-1 pre-application soil boring.

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

Photo 7: Post-application boring DV-1b showing concentrated PlumeStop in a banding pattern.

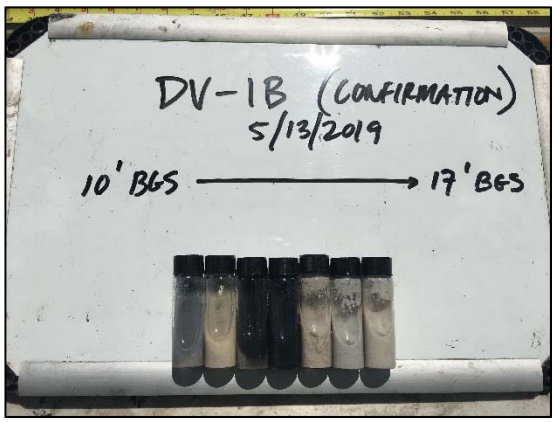


Photo 8: DV-1b sediments mixed with water demonstrating coloration by PlumeStop.

Photo 9: Pre-application soil boring DV-2.

Photo 10: Post-application cores of DV-2b denoting PlumeStop concentration at depth.

Photo 11: Soil settling vials of DV-2b sediments.

Photo 12: Pre-application boring DV-3.

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

Photo 13: Post-application core DV-6 located in the center of the treatment area.

Photo 14: Core sediments demonstrating significant influence from 13-20 ft bgs.

Photo 15: Pre-application soil boring DV-4

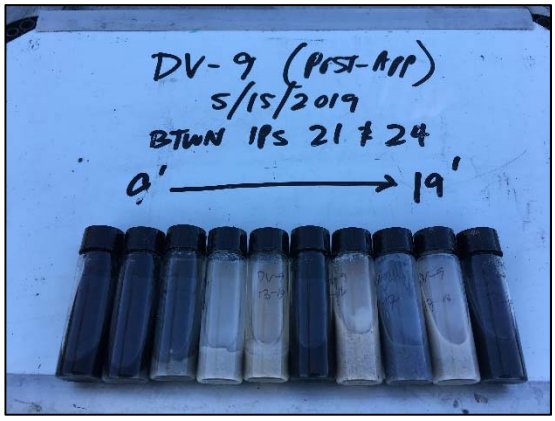


Photo 16: Post-application soil boring DV-9

Photo 17: Pre-application boring DV-5.

Photo 18: Bailed sample of groundwater from PZ-3 showing PlumeStop in sample.

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

Photo 19: PlumeStop in bailed sample from one of the permanent monitoring wells in the area.

Photo 20: Injections in progress in the Perched Zone Area.

Photo 21: Perched Zone after completing injections. MWs 34-36 pictured.

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

APPENDIX D – Injection Logs:

Table 1: Rows 1 & 2

Table 2: Row 3

PLUME STOP
Liquid Activated Carbon

Parsons - Fayetteville Works Site
PlumeStop Injection Summary Log
Perched Zone Rows 1 & 2
Table 1

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Injection Point	Date	Time	Injection Depth (feet)	Injection Pressure (psi)	Flow Rate (gpm)	Volume of PlumeStop Reagent Injected				Total Gallons Per Location	PlumeStop Reagent Concentration (ppm)	Pounds of PlumeStop Stout Injected Per Time Point	Total Pounds of PlumeStop Injected Per Location	Comments	Injection Tooling
						Beginning Flow Meter (gal)	Ending Flow Meter (gal)	Gallons Injected Per Time Point	Gallons Injected Per Interval						
1	5/8/2019	10:30	17-14	28	1.23	0.00	5.25	5.25	90	183	30,000	6.57	229	DVT location	3-Foot Screen
	5/8/2019	10:38		21	1.38	5.25	14.76	9.51			30,000	11.90			
	5/8/2019	10:41		23	2.77	14.76	21.15	6.40			30,000	8.01			
	5/8/2019	10:48		20	3.37	21.15	39.12	17.96			30,000	22.48			
	5/8/2019	10:56		18	9.23	39.12	66.72	27.60			30,000	34.55			
	5/8/2019	11:02		18	4.15	66.72	90.19	23.47			30,000	29.38			
	5/8/2019	-	14-11	36	4.11	90.19	93.24	3.05	93		30,000	3.82			
	5/8/2019	11:10		27	4.11	93.24	126.30	33.05			30,000	41.37			
	5/8/2019	11:14		30	4.68	126.30	144.00	17.70			30,000	22.15			
	5/8/2019	11:23		30	4.68	144.00	182.97	38.97			30,000	48.78			
2	5/8/2019	11:46	17-14	31	4.68	0.00	3.20	3.20	93	183	30,000	4.01	229		3-Foot Screen
	5/8/2019	11:52		27	4.94	3.20	20.89	17.69			30,000	22.14		Slight surfacing around rod.	
	5/8/2019	12:02		22	3.55	20.89	59.99	39.10			30,000	48.94			
	5/8/2019	12:11		23	3.54	59.99	92.94	32.95			30,000	41.25			
	5/8/2019	12:17	13-10	8	3.99	92.94	100.95	8.01	90		30,000	10.03		Raised extra foot due to surfacing from rod joint.	
	5/8/2019	12:23		7	3.76	100.95	122.70	21.74			30,000	27.22			
	5/8/2019	12:38		6	3.78	122.70	183.15	60.45			30,000	75.67			
3	5/8/2019	12:43	17-14	27	3.91	0.00	6.72	6.72	92	187	30,000	8.41	234		3-Foot Screen
	5/8/2019	12:49		27	4.66	6.72	34.31	27.58			30,000	34.52			
	5/8/2019	12:55		24	4.68	34.31	58.18	23.87			30,000	29.88			
	5/8/2019	13:03		12	2.37	58.18	91.85	33.67			30,000	42.15			
	5/8/2019	13:20	14-11	16	4.24	91.85	106.47	14.62	95		30,000	18.29			
	5/8/2019	13:30		16	4.35	106.47	150.57	44.10			30,000	55.20			
	5/8/2019	13:38		-	-	150.57	186.65	36.09			30,000	45.17			
4	5/8/2019	14:42	17-14	40	5.22	0.00	9.54	9.54	93	170	30,000	11.94	213		3-Foot Screen
	5/8/2019	14:52		28	5.27	9.54	48.54	39.00			30,000	48.82			
	5/8/2019	15:00		25	5.25	48.54	93.01	44.47			30,000	55.66			
	5/8/2019	15:03	14-11	28	5.27	93.01	112.18	19.17	77		30,000	24.00		Slight surfacing around rod.	
	5/8/2019	15:11		17	3.38	112.18	143.66	31.48			30,000	39.40			
	5/8/2019	15:20		-	-	143.66	170.13	26.47			30,000	33.14			
5	5/9/2019	14:14	17-14	21	4.25	0.00	90.67	90.67	91	184	30,000	113.49	230		3-Foot Screen
	5/9/2019	14:46	14-11	11	4.50	90.67	183.78	93.11	93		30,000	116.54			
6	5/9/2019	10:58	17-14	10	1.89	0.00	2.25	2.25	95	183	30,000	2.82	230		3-Foot Screen
	5/9/2019	11:02		23	3.92	2.25	9.98	7.73			30,000	9.68			
	5/9/2019	11:28		22	7.07	9.98	94.53	84.55			30,000	105.83			
	5/9/2019	11:48	14-11	0	4.58	94.53	183.36	88.83	89		30,000	111.18			
7	5/8/2019	13:15	17-14	28	3.65	0.00	9.82	9.82	91	183	30,000	12.30	229		3-Foot Screen
	5/8/2019	13:21		30	4.33	9.82	26.12	16.29			30,000	20.39			
	5/8/2019	13:31		32	4.23	26.12	66.05	39.93			30,000	49.98			
	5/8/2019	13:37		44	4.11	66.05	91.37	25.32			30,000	31.70			
	5/8/2019	13:47	14-11	10	4.48	91.37	102.70	11.33	92		30,000	14.18			
	5/8/2019	13:52		6	4.45	102.70	146.40	43.69			30,000	54.69			
	5/8/2019	14:00		5	4.48	146.40	183.09	36.70			30,000	45.93			
8	5/9/2019	15:12	17-14	33	1.67	0.00	6.54	6.54	100	186	30,000	8.19	232		3-Foot Screen
	5/9/2019	15:42		-	-	6.54	99.82	93.28			30,000	116.76			
	5/9/2019	15:55	14-11	20	0.57	99.82	129.21	29.39	86		30,000	36.78			
	5/9/2019	16:07		-	-	129.21	185.68	56.47			30,000	70.69			
9	5/9/2019	10:45	17-14	80	1.10	0.00	8.54	8.54	94	183	30,000	10.68	229		3-Foot Screen
	5/9/2019	11:02		25	3.63	8.54	40.58	32.05			30,000	40.11			
	5/9/2019	11:33		10	4.87	40.58	93.80	53.22			30,000	66.61			
	5/9/2019	11:55	14-11	6	1.49	93.80	183.09	89.30	89		30,000	111.77			
10	5/13/2019	11:59	18-15	32	3.32	0.00	5.55	5.55	92	193	30,000	6.95	241		3-Foot Screen
	5/13/2019	12:22		29	4.09	5.55	91.65	86.10			30,000	107.77			
	5/13/2019	13:13	15-12	10	-	91.65	172.07	80.41	101		30,000	100.65		Flowmeter stopped.	
	5/13/2019	-	-	-	-	172.07	192.63	20.56			30,000	25.74		Volume estimated.	
11	5/9/2019	15:23	18-15	27	5.14	0.00	8.00	8.00	88	170	30,000	10.01	213		3-Foot Screen
	5/9/2019	15:39		21	5.81	8.00	88.49	80.49			30,000	100.75			
	5/9/2019	15:55	15-12	22	4.14	88.49	119.49	31.00	82		30,000	38.80			
	5/9/2019	16:07		-	-	119.49	170.09	50.60			30,000	63.33			
12	5/13/2019	14:58	18-15	22	-	0.00	192.63	192.63	193	193	30,000	241.12	241	Location volume injected at depth.	3-Foot Screen
13	5/13/2019	12:05	18-15	12	-	0.00	4.57	4.57	95	193	30,000	5.72	241		3-Foot Screen
	5/13/2019	12:30		-	-	4.57	46.83	42.26			30,000	52.89		Backpressure noted.	
	5/13/2019	13:11		0	-	46.83	95.15	48.32			30,000	60.48			
	5/13/2019	-	15-12	-	-	95.15	192.63	97.49	97		30,000	122.02		Volume estimated.	
14	5/14/2019	8:09	18-15	19	4.59	0.00	96.36	96.36	96	171	30,000	120.61	214		3-Foot Screen
	5/14/2019	8:33	15-12	12	4.37	96.36	171.05	74.68	75		30,000	93.48			
15	5/13/2019	14:32	18-15	18	3.69	0.00	88.39	88.39	88	193	30,000	110.63	241		3-Foot Screen
	5/13/2019	-	15-12	-	-	88.39	192.63	104.25	104		30,000	130.48		Volume estimated.	
16	5/14/2019	8:01	18-15	20	4.81	0.00	76.76	76.76	77	172	30,000	96.07	215		3-Foot Screen
	5/14/2019	8:30	15-12	15	4.04	76.76	171.58	94.83	95		30,000	118.69			

PLUME STOP
Liquid Activated Carbon

Parsons - Fayetteville Works Site
PlumeStop Injection Summary Log
Perched Zone Rows 1 & 2
Table 1

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Injection Point	Date	Time	Injection Depth (feet)	Injection Pressure (psi)	Flow Rate (gpm)	Volume of PlumeStop Reagent Injected				Total Gallons Per Location	PlumeStop Reagent Concentration (ppm)	Pounds of PlumeStop Stout Injected Per Time Point	Total Pounds of PlumeStop Injected Per Location	Comments	Injection Tooling
						Beginning Flow Meter (gal)	Ending Flow Meter (gal)	Gallons Injected Per Time Point	Gallons Injected Per Interval						
17	5/13/2019	11:33	20-18	23	6.22	0.00	9.18	9.18	69	245	30,000	11.49	306		3-Foot Screen
	5/13/2019	12:13		14	4.37	9.18	68.86	59.68			30,000	74.69			
	5/13/2019	12:53	18-15	8	2.97	68.86	163.08	94.23	176		30,000	117.94			
	5/13/2019	13:27	15-12	4	4.53	163.08	244.83	81.75			30,000	102.32			
18	5/14/2019	10:40	20-19	125	1.62	0.00	15.13	15.13	15	235	30,000	18.93	295		Pressure Activated Probe
	5/14/2019	10:44	19-18.5	21	3.36	15.13	29.89	14.76	15		30,000	18.48			
	5/14/2019	10:49	18.5-18	19	3.74	29.89	46.04	16.15	16		30,000	20.21			
	5/14/2019	10:53	18-17.5	19	4.22	46.04	60.26	14.23	14		30,000	17.81			
	5/14/2019	10:56	17.5-17	18	4.27	60.26	80.22	19.96	20		30,000	24.98			
	5/14/2019	11:00	17-16.5	18	4.29	80.22	91.05	10.83	11		30,000	13.55			
	5/14/2019	11:03	16.5-16	18	4.31	91.05	106.35	15.30	15		30,000	19.15			
	5/14/2019	11:07	16-15.5	17	4.32	106.35	121.19	14.83	15		30,000	18.57			
	5/14/2019	11:09	15.5-15	17	4.33	121.19	131.25	10.06	10		30,000	12.59			
	5/14/2019	11:15	15-14.5	14	4.21	131.25	146.21	14.96	15		30,000	18.73			
	5/14/2019	11:19	14.5-14	15	4.35	146.21	164.01	17.80	18		30,000	22.28			
	5/14/2019	11:22	14-13.5	16	4.39	164.01	177.05	13.04	13		30,000	16.33			
	5/14/2019	11:25	13.5-13	16	4.43	177.05	192.18	15.13	15		30,000	18.93			
	5/14/2019	11:30	13-12.5	15	4.43	192.18	235.43	43.26	43		30,000	54.14			
19	5/14/2019	7:55	20-18	10	4.95	0.00	61.74	61.74	62	241	30,000	77.28	301		3-Foot Screen
	5/14/2019	8:13	18-15	0	2.67	61.74	158.49	96.75	97		30,000	121.10			
	5/14/2019	8:32	15-12	0	4.13	158.49	240.86	82.38	82		30,000	103.11			
20	5/13/2019	14:05	20-18	13	2.95	0.00	60.95	60.95	61	193	30,000	76.29	241		3-Foot Screen
	5/13/2019	14:37	18-15	13	4.18	60.95	155.48	94.53	95		30,000	118.33			
	5/13/2019	-	15-12	-	-	155.48	192.63	37.15	37		30,000	46.50		Volume estimated.	
21	5/14/2019	14:29	12-13	6	1.76	0.00	30.17	30.17	30	220	30,000	37.77	275	Top-down approach.	3-Foot Screen
	5/14/2019	15:06	13-14	13	3.68	30.17	60.29	30.12	30		30,000	37.70			
	5/14/2019	15:22	14-15	84	3.38	60.29	92.84	32.55	33		30,000	40.74			
	5/14/2019	15:44	15-16	13	2.50	92.84	121.35	28.50	29		30,000	35.68			
	5/14/2019	16:04	16-17	46	0.91	121.35	149.43	28.08	28		30,000	35.15			
	5/14/2019	16:34	17-18	110	1.29	149.43	176.04	26.61	27		30,000	33.31			
	5/15/2019	8:45	18-20	125	0.50	0.00	43.95	43.95	44		30,000	55.02		Clogged screen.	
22	5/15/2019	14:33	20-18	12	3.54	0.00	10.20	10.20	95	307	30,000	12.77	385		3-Foot Screen
	5/15/2019	14:52		6	4.43	10.20	94.56	84.36			30,000	105.59			
	5/15/2019	14:54	18-15	4	4.47	94.56	102.68	8.12	104		30,000	10.17			
	5/15/2019	15:09		-	-	102.68	122.31	19.63			30,000	24.57			
	5/16/2019	6:58		6	5.20	120.52	196.57	76.05			30,000	95.19			
	5/16/2019	7:20	15-12	-	-	0.00	109.04	109.04	109		30,000	136.48			
23	5/16/2019	9:28	21-18	32	5.71	0.00	13.42	13.42	77	247	30,000	16.80	309		3-Foot Screen
	5/16/2019	9:43		25	5.65	13.42	77.24	63.82			30,000	79.88			
	5/16/2019	10:00	18-15	22	5.98	77.24	176.63	99.39	99		30,000	124.41			
	5/16/2019	10:22	15-12	-	-	176.63	246.55	69.92	70		30,000	87.52			
24	5/14/2019	14:35	13-14	120	1.75	0.00	29.88	29.88	30	299	30,000	37.40	374	Top-down approach.	3-Foot Screen
	5/14/2019	15:04	14-15	0	3.40	29.88	60.98	31.10	31		30,000	38.93			
	5/14/2019	15:20	15-16	120	4.65	60.98	90.50	29.52	30		30,000	36.94			
	5/14/2019	15:42	16-17	75	1.93	90.50	121.19	30.69	31		30,000	38.41			
	5/14/2019	15:57	17-18	32	4.04	121.19	151.41	30.22	30		30,000	37.83			
	5/14/2019	16:11	18-19	52	2.19	151.41	182.83	31.43	31		30,000	39.34			
	5/15/2019	7:59	19-20	10	1.97	0.00	31.08	31.08	31		30,000	38.90			
	5/15/2019	8:18	20-21	78	1.75	31.08	65.89	34.81	35		30,000	43.57			
	5/15/2019	11:16	21-22	47	1.83	65.89	115.81	49.93	50		30,000	62.49			
25	5/16/2019	7:58	22-19	28	4.80	0.00	32.18	32.18	122	324	30,000	40.28	406		3-Foot Screen
	5/16/2019	8:15		20	4.78	32.18	121.52	89.34			30,000	111.83			
	5/16/2019	8:22	19-16	14	2.92	121.52	147.09	25.56	86		30,000	32.00			
	5/16/2019	8:42		17	3.37	147.09	207.41	60.32			30,000	75.50			
	5/16/2019	9:11	16-13	11	5.08	207.41	324.27	116.86	117		30,000	146.27			
26	5/15/2019	14:15	21-18	32	5.08	0.00	5.80	5.80	6	321	30,000	7.26	402		3-Foot Screen
	5/15/2019	14:40	18-15	17	4.72	5.80	99.49	93.69	191		30,000	117.27			
	5/15/2019	14:41		19	3.63	99.49	101.36	1.87			30,000	2.34			
	5/15/2019	15:10		-	-	101.36	177.62	76.26			30,000	95.45			
	5/16/2019	6:38		23	4.81	175.02	194.15	19.13			30,000	23.95			
	5/16/2019	7:04	15-12	11	9.91	0.00	124.41	124.41	124		30,000	155.72			
27	5/16/2019	8:24	21-18	9	3.89	0.00	42.38	42.38	103	305	30,000	53.05	381		3-Foot Screen
	5/16/2019	8:39		9	3.97	42.38	103.12	60.74			30,000	76.02			
	5/16/2019	9:04	18-15	0	2.29	103.12	187.24	84.13	202		30,000	105.30			
	5/16/2019	9:39		0	3.99	187.24	304.79	117.54			30,000	147.13			
28	5/16/2019	7:42	22-19	26	5.61	0.00	49.68	49.68	117	324	30,000	62.18	405		3-Foot Screen
	5/16/2019	7:54		19	4.50	49.68	116.55	66.87			30,000	83.70			
	5/16/2019	7:58	19-16	19	4.86	116.55	132.79	16.24	101		30,000	20.32			
	5/16/2019	8:14		17	4.72	132.79	217.86	85.07			30,000	106.48			
	5/16/2019	8:23	16-13	16	3.79	217.86	234.84	16.98	106		30,000	21.25			
	5/16/2019	8:44		19	4.44	234.84	323.55	88.71			30,000	111.04			

PLUME STOP Liquid Activated Carbon

Parsons - Fayetteville Works Site
PlumeStop Injection Summary Log
Perched Zone Rows 1 & 2
Table 1

REGENESIS REMEDIATION SERVICES Technology-Based Solutions for the Environment

Injection Point	Date	Time	Injection Depth (feet)	Injection Pressure (psi)	Flow Rate (gpm)	Volume of PlumeStop Reagent Injected				Total Gallons Per Location	PlumeStop Reagent Concentration (ppm)	Pounds of PlumeStop Stout Injected Per Time Point	Total Pounds of PlumeStop Injected Per Location	Comments	Injection Tooling
						Beginning Flow Meter (gal)	Ending Flow Meter (gal)	Gallons Injected Per Time Point	Gallons Injected Per Interval						
29	5/15/2019	10:20	13-13.5	5	4.47	0.00	16.10	16.10	16	316	30,000	20.15	395	Top-down approach.	Pressure Activated Probe
	5/15/2019	10:42	13.5-14	90	3.38	16.10	31.82	15.72	16		30,000	19.68		Surfacing noted.	
	5/15/2019	10:55	14-14.5	32	5.37	31.82	47.28	15.46	15		30,000	19.35			
	5/15/2019	11:13	14.5-15	30	5.69	47.28	62.77	15.49	15		30,000	19.39		Surfacing noted.	
	5/15/2019	11:22	15-15.5	18	3.69	62.77	78.76	15.98	16		30,000	20.01			
	5/15/2019	11:31	15.5-16	25	3.95	78.76	94.52	15.76	16		30,000	19.73			
	5/15/2019	11:46	16-16.5	65	1.99	94.52	110.12	15.60	16		30,000	19.52			
	5/15/2019	11:54	16.5-17	90	2.81	110.12	126.04	15.92	16		30,000	19.93			
	5/15/2019	12:00	17-17.5	21	5.44	126.04	142.36	16.32	16		30,000	20.43			
	5/15/2019	12:15	17.5-18	30	3.99	142.36	158.07	15.71	16		30,000	19.67			
	5/15/2019	13:06	22-18	25	3.67	0.00	8.14	8.14	8		30,000	10.19		Bottom-up	3-Foot Screen
	5/15/2019	13:17	18-15	19	5.16	8.14	58.21	50.06	50		30,000	62.66			
	5/15/2019	13:34	15-12	17	4.72	58.21	157.68	99.47	99		30,000	124.51			
30	5/15/2019	9:57	21-20	14	4.76	0.00	8.06	8.06	31	284	30,000	10.09	355		3-Foot Screen
	5/15/2019	10:02		8	4.92	8.06	31.18	23.12			30,000	28.94			
	5/15/2019	10:29	20-19	5	4.45	31.18	62.48	31.30	31		30,000	39.17			
	5/15/2019	10:37	19-18	8	4.85	62.48	95.59	33.11	33		30,000	41.45			
	5/15/2019	10:54	18-17	28	5.47	95.59	126.02	30.43	30		30,000	38.08			
	5/15/2019	11:06	17-16	25	10.05	126.02	157.44	31.42	31		30,000	39.33			
	5/15/2019	11:23	16-15	18	8.31	157.44	188.19	30.75	31		30,000	38.49			
	5/15/2019	11:33	15-14	0	3.57	188.19	224.53	36.34	36		30,000	45.49			
	5/15/2019	11:42	14-13	0	4.70	224.53	253.10	28.57	29		30,000	35.76			
	5/15/2019	11:47	13-12	0	4.55	253.10	283.56	30.46	30		30,000	38.12			
31	5/15/2019	10:02	13-13.5	90	6.23	0.00	17.76	17.76	18	75	30,000	22.23	94	Top-down approach.	Pressure Activated Probe
	5/15/2019	10:45	13.5-14	87	2.46	17.76	21.22	3.46	3		30,000	4.34			
	5/15/2019	11:03	14-14.5	86	4.14	21.22	47.07	25.85	26		30,000	32.36			
	5/15/2019	11:11	14.5-15	46	4.39	47.07	62.98	15.91	16		30,000	19.92		Surfacing.	
	5/15/2019	11:25	15-15.5	46	5.79	62.98	74.79	11.81	12		30,000	14.78		Abandoned. Remaining volume injected at adjacent IP-32.	
32	5/15/2019	13:45	22-19	9	4.53	0.00	126.36	126.36	204	491	30,000	158.16	615	IP-31 15-22' interval volume injected at IP-32.	3-Foot Screen
	5/15/2019	14:06		-	-	126.36	203.65	77.29			30,000	96.74			
	5/15/2019	14:19	19-16	34	3.19	203.65	205.61	1.96	172		30,000	2.46			
	5/15/2019	14:36		20	4.69	205.61	281.98	76.37			30,000	95.59			
	5/15/2019	14:58		17	4.83	281.98	375.57	93.59			30,000	117.14			
	5/15/2019	15:11	16-13	-	-	375.57	376.21	0.64	116		30,000	0.80			
	5/16/2019	6:55		0	4.65	370.70	485.79	115.09			30,000	144.06			
										Total Gallons:			**Total Pounds Injected:**		
										7,351			9,201		

PLUME STOP
Liquid Activated Carbon

Parsons - Fayetteville Works Site
PlumeStop Injection Summary Log
Perched Zone Row 3
Table 2

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Injection Point	Date	Time	Injection Depth (feet)	Injection Pressure (psi)	Flow Rate (gpm)	Volume of PlumeStop Reagent Injected				Total Gallons Per Location	PlumeStop Reagent Concentration (ppm)	Pounds of PlumeStop Injected Per Time Point	Total Pounds of PlumeStop Injected Per Location	Comments	Injection Tooling
						Beginning Flow Meter (gal)	Ending Flow Meter (gal)	Gallons Injected Per Time Point	Gallons Injected Per Interval						
33	5/10/2019	8:41	17-14	24	3.54	0.00	6.36	6.36	6	282	13,500	17.90	794		3-Foot Screen
	5/10/2019	9:33	14-11	18	-	6.36	133.68	127.33	276		13,500	358.48			
	5/10/2019	10:02		-	-	133.68	282.11	148.42			13,500	417.88		Volume estimated.	
34	5/9/2019	7:54	17-14	20	1.79	0.00	10.47	10.47	198	311	13,500	29.49	876		3-Foot Screen
	5/9/2019	8:17		29	5.03	10.47	44.03	33.56			13,500	94.48			
	5/9/2019	8:46		-	-	44.03	198.10	154.07			13,500	433.77			
	5/9/2019	8:52	14-11	20	5.45	198.10	201.68	3.59	113		13,500	10.10			
	5/9/2019	9:10		0	5.00	201.68	304.40	102.72			13,500	289.20		Surfacing from abandoned boring.	
	5/9/2019	9:18		-	-	304.40	311.10	6.70			13,500	18.86			
35	5/10/2019	8:11	17-14	27	3.50	0.00	9.75	9.75	143	282	13,500	27.46	794		3-Foot Screen
	5/10/2019	8:49		24	4.11	9.75	142.62	132.87			13,500	374.09			
	5/10/2019	8:51	14-11	21	4.25	142.62	150.97	8.34	139		13,500	23.49			
	5/10/2019	9:39		-	-	150.97	282.11	131.14			13,500	369.22		Volume estimated.	
36	5/10/2019	10:47	17-14	26	7.90	0.00	2.90	2.90	131	258	13,500	8.17	727		3-Foot Screen
	5/10/2019	11:35		10	2.47	2.90	79.67	76.76			13,500	216.13		Slight surfacing from around rod; decreased flow rate to mitigate.	
	5/10/2019	11:54		9	4.30	79.67	130.66	51.00			13,500	143.58			
	5/10/2019	12:55	14-11	10	3.08	130.66	258.35	127.68	128		13,500	359.49			
37	5/9/2019	8:13	17-14	10	-	0.00	4.49	4.49	153	297	13,500	12.65	836		3-Foot Screen
	5/9/2019	8:16		26	5.16	4.49	18.68	14.18			13,500	39.93			
	5/9/2019	8:46		-	-	18.68	152.80	134.13			13,500	377.63			
	5/9/2019	8:56	14-11	12	4.64	152.80	171.86	19.06	144		13,500	53.66			
	5/9/2019	9:18		10	6.37	171.86	272.95	101.09			13,500	284.63			
	5/9/2019	9:25		-	-	272.95	296.90	23.95			13,500	67.42			
38	5/10/2019	10:51	18-15	36	4.73	0.00	4.77	4.77	158	281	13,500	13.42	792		3-Foot Screen
	5/10/2019	11:34		24	5.00	4.77	112.31	107.54			13,500	302.77			
	5/10/2019	11:45		24	4.99	112.31	157.54	45.24			13,500	127.36			
	5/10/2019	12:36	15-12	12	3.79	157.54	281.43	123.89	124		13,500	348.80			
39	5/13/2019	10:28	19-16	32	4.60	0.00	32.42	32.42	158	284	13,500	91.28	800		3-Foot Screen
	5/13/2019	10:53		25	4.64	32.42	158.00	125.58			13,500	353.57		Slight backpressure noted.	
	5/13/2019	11:07	16-13	20	3.90	158.00	178.00	20.00	126		13,500	56.31			
	5/13/2019	11:27		20	4.26	178.00	284.00	106.00			13,500	298.44			
40	5/16/2019	10:41	19-16	20	5.06	0.00	4.35	4.35	132	263	13,500	12.24	742		3-Foot Screen
	5/16/2019	11:21		12	5.97	4.35	132.43	128.09			13,500	360.62			
	5/16/2019	11:23	16-13	10	4.85	132.43	138.00	5.57	131		13,500	15.67			
	5/16/2019	11:56		0	4.54	138.00	263.48	125.48			13,500	353.29			
41	5/10/2019	9:08	18-15	28	5.39	0.00	13.33	13.33	141	282	13,500	37.53	794		3-Foot Screen
	5/10/2019	10:02		-	-	13.33	141.05	127.72			13,500	359.60		Volume estimated.	
	5/10/2019	10:41	15-12	-	-	141.05	282.11	141.05	141		13,500	397.13		Volume estimated.	
42	5/16/2019	11:25	21-19	19	4.71	0.00	40.71	40.71	86	263	13,500	114.61	740		3-Foot Screen
	5/16/2019	11:35		19	4.92	40.71	85.51	44.80			13,500	126.14			
	5/16/2019	12:18	19-16	12	6.07	85.51	262.74	177.23	177		13,500	498.98			
43	5/16/2019	10:38	20-18	28	5.16	0.00	18.13	18.13	80	280	13,500	51.04	789		3-Foot Screen
	5/16/2019	10:58		18	3.81	18.13	80.14	62.02			13,500	174.61			
	5/16/2019	10:59	18-15	12	3.36	80.14	83.14	2.99	102		13,500	8.43			
	5/16/2019	11:37		8	2.31	83.14	181.86	98.72			13,500	277.95			
	5/16/2019	12:06	15-12	-	4.85	181.86	280.16	98.30	98		13,500	276.77			
44	5/10/2019	12:21	20-18	19	4.63	0.00	66.83	66.83	67	318	13,500	188.16	895		3-Foot Screen
	5/10/2019	12:49	18-15	15	4.31	66.83	176.58	109.75	110		13,500	309.01			
	5/10/2019	13:31	15-12	16	5.46	176.58	317.91	141.32	141		13,500	397.89			
45	5/16/2019	12:56	22-19	25	5.67	0.00	11.97	11.97	134	385	10,541	26.32	846		3-Foot Screen
	5/16/2019	13:27		8	4.14	11.97	134.29	122.32			10,541	268.91			
	5/16/2019	13:46	19-16	12	4.32	134.29	213.26	78.97	143		10,541	173.60			
	5/16/2019	14:04		11	3.30	213.26	277.18	63.92			10,541	140.51		Surfacing.	
	5/16/2019	14:48	16-13	11	3.14	277.18	384.93	107.75	108		10,541	236.88			
46	5/17/2019	6:53	22-19	12	2.88	0.00	18.20	18.20	144	346	10,541	40.01	761		3-Foot Screen
	5/17/2019	7:25		12	4.24	18.20	144.22	126.02			10,541	277.03			
	5/17/2019	8:00	19-16	12	4.87	144.22	272.86	128.64	129		10,541	282.79			
	5/17/2019	8:21	16-13	11	4.82	272.86	346.22	73.36	73		10,541	161.28		End of project volume.	
47	5/16/2019	13:05	22-19	14	4.26	0.00	18.86	18.86	137	350	10,541	41.47	769		3-Foot Screen
	5/16/2019	13:40		4	3.89	18.86	137.49	118.62			10,541	260.78			
	5/16/2019	13:47	19-16	18	3.70	0.00	35.61	35.61	132		10,541	78.29		Surfacing.	
	5/16/2019	14:15		6	3.42	35.61	132.39	96.78			10,541	212.76		Surfacing.	
	5/16/2019	14:50	16-13	6	3.54	132.39	212.48	80.09	80		10,541	176.07			
48	5/17/2019	6:54	22-19	8	2.68	0.00	13.61	13.61	108	383	10,541	29.93	843		3-Foot Screen
	5/17/2019	7:24		5	4.22	13.61	108.43	94.82			10,541	208.45			
	5/17/2019	7:54	19-16	4	6.34	108.43	277.96	169.53	170		10,541	372.69			
	5/17/2019	8:21	16-13	0	4.58	277.96	383.38	105.42	105		10,541	231.74		End of project volume.	
										Total Gallons:			**Total Pounds Injected:**		
										4,867			12,799		

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

APPENDIX E – Water Level Measurements

PLUME STOP Liquid Activated Carbon

Parsons - Fayetteville Works Site
Perched Zone Pilot Study Area
Depth to Water (DTW) and PlumeStop Measurements

REGENESIS REMEDIATION SERVICES Technology-Based Solutions for the Environment

Location	Date	Time	DTW (ft from TOC)	DTW (ft bgs)	Concentration PlumeStop (ppm)	Comments
MW-31	5/10/19	-	15.81	13.61		Baseline.
	5/15/19	12:51	15.70	13.50		
	5/16/19	7:28	15.61	13.41		
	5/17/19	10:00	15.61	13.41		
MW-32	5/10/19	-	14.87	12.32		Baseline.
	5/17/19	9:58	14.69	12.14	0	
MW-33	5/10/19	-	14.32	11.82		Baseline.
	5/15/19	12:56	14.33	11.83		
	5/16/19	7:14	14.28	11.78		
	5/17/19	9:35	14.33	11.83		
MW-34	5/10/19	-	15.86	13.41		Baseline.
	5/13/19	9:29	15.89	13.44		
	5/14/19	8:57	15.66	13.21		
	5/14/19	12:02	16.71	14.26	6,550	
	5/14/19	16:40	15.85	13.40		
	5/15/19	8:37	15.27	12.82		
	5/15/19	12:33	15.55	13.10		
	5/16/19	7:25	15.54	13.09		
	5/17/19	7:19	14.71	12.26		
	5/17/19	8:36	14.71	12.26	9,550	
MW-35	5/10/19	-	15.35	12.90		Baseline.
	5/13/19	9:37	14.00	11.55	29,250	Pressure noted.
	5/13/19	15:16	14.56	12.11		
	5/14/19	8:53	14.80	12.35		
	5/14/19	11:55	14.84	12.39		
	5/14/19	16:40	15.14	12.69		
	5/15/19	8:43	15.19	12.74		
	5/16/19	7:21	15.07	12.62		
	5/17/19	7:27	15.05	12.60		
	5/17/19	9:05	15.11	12.66	16,050	
MW-36	5/8/19	10:33	15.62	12.62		Baseline.
	5/8/19	10:51	15.41	12.41		
	5/8/19	11:19	15.32	12.32		
	5/8/19	12:10	15.30	12.30		
	5/8/19	12:41	15.25	12.25		
	5/8/19	13:34	14.61	11.61	26,550	Sample bailed at 13:17.
	5/8/19	15:39	15.18	12.18		
	5/9/19	9:08	9.94	6.94		
	5/9/19	11:07	9.88	6.88		
	5/9/19	16:47	14.95	11.95		
	5/10/19	-	15.55	12.55		
	5/13/19	9:40	15.58	12.58	19,250	
	5/13/19	15:11	14.15	11.15		
	5/15/19	12:54	15.52	12.52		
	5/16/19	7:17	15.43	12.43		
	5/17/19	9:17	15.46	12.46	30,050	
PZ-1	5/8/19	10:30	15.78	11.91		Baseline; first bailed sample very cloudy.
	5/8/19	10:54	15.39	11.52		
	5/8/19	11:21	15.25	11.38		
	5/8/19	12:08	14.98	11.11		Well water clear.
	5/8/19	12:44	15.16	11.29		No PlumeStop in well.
	5/8/19	13:35	14.37	10.50		
	5/8/19	15:40	15.19	11.32	150	
	5/9/19	9:10	14.78	10.91		
	5/9/19	11:09	13.80	9.93		
	5/9/19	16:49	15.46	11.59		
	5/10/19	-	15.75	11.88		
	5/13/19	9:42	14.79	10.92	2,350	
	5/13/19	15:09	15.42	11.55		
	5/15/19	12:40	15.76	11.89		
	5/16/19	7:15	15.66	11.79		
	5/17/19	9:20	15.67	11.80	3,050	

PLUME STOP Liquid Activated Carbon

Parsons - Fayetteville Works Site
Perched Zone Pilot Study Area
Depth to Water (DTW) and PlumeStop Measurements

REGENESIS REMEDIATION SERVICES Technology-Based Solutions for the Environment

Location	Date	Time	DTW (ft from TOC)	DTW (ft bgs)	Concentration PlumeStop (ppm)	Comments
PZ-2	5/9/19	9:50	14.45	12.15		Baseline.
	5/9/19	10:57	15.37	13.07		
	5/9/19	16:52	14.39	12.09		
	5/10/19	-	14.54	12.24		
	5/13/19	9:32	14.56	12.26	21,550	
	5/13/19	15:13	14.05	11.75		
	5/14/19	8:48	14.01	11.71		
	5/14/19	11:52	14.16	11.86		
	5/14/19	16:40	14.34	12.04		
	5/15/19	8:41	14.30	12.00		
	5/15/19	12:35	15.44	13.14		
	5/16/19	7:23	13.88	11.58		
	5/17/19	7:25	14.39	12.09		
	5/17/19	8:58	14.30	12.00	10,050	
PZ-3	5/9/19	16:53	15.86	12.69		Baseline.
	5/10/19	-	15.97	12.80		
	5/13/19	9:30	16.03	12.86		
	5/14/19	9:00	16.82	13.65		
	5/14/19	12:00	15.88	12.71	6,550	
	5/15/19	8:39	15.89	12.72		
	5/15/19	12:32	15.75	12.58		
	5/16/19	7:33	15.62	12.45		
	5/17/19	8:40	15.58	12.41	21,050	
PZ-34	5/10/19	-	15.82	13.27		Baseline.
	5/14/19	12:38	15.88	13.33	0	
	5/15/19	12:43	15.91	13.36	0	
	5/16/19	7:19	15.91	13.36		
	5/17/19	10:02	15.80	13.25		

Global Headquarters
1011 Calle Sombra
San Clemente, CA 92673
Ph: (949) 366-8000
Fax: (949) 366-8090

End of document.

Attachment A-4

Old Outfall 002 Monthly Sampling Results

Old Outfall 002 Monthly Sampling Results
Chemours Fayetteville Works
Fayetteville, North Carolina

Location ID		OLDOF-2B		OLDOF-A		OLDOF-A-SEEP			OLDOF-B			
Date Sampled		03/21/2019	05/15/2019	03/21/2019	05/15/2019	03/21/2019	04/17/2019	05/15/2019	03/21/2019	04/17/2019	04/17/2019	05/15/2019
Sample Purpose		FS	FS	FS	FS	FS	FS	FS	FS	FS	DUP	FS
Parameter Name	Units	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
537 Modified												
Perfluorobutane Sulfonic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorobutanoic Acid	UG/L	**0.079**	**0.088**	**0.08**	**0.082**	**0.082**	**0.084**	**0.027**	**0.081**	**0.083**	**0.082**	**0.086**
Perfluorodecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorododecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroheptanoic Acid	UG/L	**0.022**	**0.026**	**0.026**	**0.027**	**0.024**	**0.026**	**0.0045**	**0.024**	**0.024**	**0.024**	**0.025**
Perfluorohexane Sulfonic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorohexanoic Acid	UG/L	**0.014**	**0.016**	**0.014**	**0.014**	**0.015**	**0.015**	**0.006**	**0.015**	**0.015**	**0.016**	**0.016**
Perfluorononanoic Acid	UG/L	**0.0067**	**0.011**	**0.007**	**0.0069**	**0.0081**	**0.0083**	<0.0020	**0.0071**	**0.0071**	**0.0074**	**0.012**
Perfluoropentanoic Acid	UG/L	**0.15**	**0.15**	**0.15**	**0.16**	**0.14**	**0.14**	**0.029**	**0.14**	**0.15**	**0.14**	**0.15**
Perfluoroundecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
PFOA	UG/L	**0.032**	**0.037**	**0.032**	**0.032**	**0.037**	**0.037**	<0.0020	**0.034**	**0.031**	**0.032**	**0.037**
PFOS	UG/L	**0.002**	**0.003**	**0.0022**	**0.0023**	**0.0022**	**0.0022**	<0.0020	**0.0021**	**0.0022**	**0.0021**	**0.0038**
Hfpo Dimer Acid	UG/L	**8**	**8**	**6**	**6.5**	**8.4**	**7.5**	**1.8**	**7.4**	**6.9 J**	**8.8 J**	**7.8**
Perfluorodecane Sulfonic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorotetradecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorotridecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
10:2 Fluorotelomer sulfonate	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
6:2 Fluorotelomer sulfonate	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
ADONA	UG/L	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
F-53B Major	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
F-53B Minor	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
N-ethyl perfluorooctane sulfonamidoacetic acid	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
N-methyl perfluorooctane sulfonamidoacetic acid	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
NaDONA	UG/L	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
Perfluorododecane sulfonic acid (PFDoS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroheptane sulfonic acid (PFHpS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorohexadecanoic acid (PFHxDA)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorononanesulfonic acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctadecanoic acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctane Sulfonamide	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentane sulfonic acid (PFPeS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020

Notes:
NR = Not Reported
< = Not detected above the method detection limit
J = Estimated value
UJ = Not detected (estimated detection limit)
Detected results are presented in bold type

TABLE 1

Old Outfall 002 Monthly Sampling Results
Chemours Fayetteville Works
Fayetteville, North Carolina

Location ID		OLDOF-2B		OLDOF-A		OLDOF-A-SEEP			OLDOF-B			
Date Sampled		03/21/2019	05/15/2019	03/21/2019	05/15/2019	03/21/2019	04/17/2019	05/15/2019	03/21/2019	04/17/2019	04/17/2019	05/15/2019
Sample Purpose		FS	FS	FS	FS	FS	FS	FS	FS	FS	DUP	FS
Parameter Name	Units	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Cl. Spec. Table 3 Compound SOP												
N-ethylperfluoro-1-octanesulfonamide	UG/L	<0.075 UJ	<0.075	<0.075 UJ	<0.075	<0.075 UJ	<0.037	<0.037	<0.075 UJ	<0.037	<0.037	<0.037
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	UG/L	<0.12	<0.12	<0.12	<0.12	<0.12	<0.060 UJ	<0.060	**0.12**	<0.060 UJ	<0.060	<0.060
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	UG/L	<0.22	<0.22	<0.22	<0.22	<0.22	<0.11	<0.11	<0.22	<0.11	<0.11	<0.11
Byproduct 4	UG/L	<0.32	**0.52**	**0.35**	**0.53**	**0.35**	**0.4**	**0.19**	**0.32**	**0.53**	**0.46**	**0.57**
Byproduct 5	UG/L	**0.80 J**	**1.5**	**0.76 J**	**1.4**	**0.86 J**	**1**	<0.058	**0.75 J**	**1**	**0.98**	**1.4**
Byproduct 6	UG/L	<0.031	<0.031	<0.031	<0.031	<0.031	**0.018**	<0.015	<0.031	**0.015**	**0.015**	**0.015**
EVE Acid	UG/L	<0.049	<0.049	<0.049	<0.049	<0.049	<0.024	<0.024	<0.049	<0.024	<0.024	<0.024
Hydro-EVE Acid	UG/L	**0.17**	**0.22**	**0.17**	**0.19**	**0.17**	**0.21**	<0.028	**0.16**	**0.19**	**0.19**	**0.22**
N-methyl perfluoro-1-octanesulfonamide	UG/L	<0.069 UJ	<0.069	<0.069	<0.069	<0.069	<0.035	<0.035	<0.069	<0.035	<0.035	<0.035
NVHOS	UG/L	**0.71**	**0.78**	**0.73**	**0.77**	**0.8**	**0.88**	<0.054	**0.61**	**0.82**	**0.84**	**0.83**
PEPA	UG/L	**1.9**	**1.9**	**1.9**	**1.8**	**2.2**	**2.1**	**1.1**	**1.9**	**2**	**2**	**1.9**
PES	UG/L	<0.092	<0.092	<0.092	<0.092	<0.092	<0.046	<0.046	<0.092	<0.046	<0.046	<0.046
PFECA B	UG/L	<0.12	<0.12	<0.12	<0.12	<0.12	<0.060	<0.060	<0.12	<0.060	<0.060	<0.060
PFECA-G	UG/L	<0.082	<0.082	<0.082	<0.082	<0.082	<0.041	<0.041	<0.082	<0.041	<0.041	<0.041
PFESA-BP1	UG/L	**0.19**	<0.053	**0.19**	<0.053	**0.17**	**0.14**	<0.027	**0.15**	**0.11**	**0.13**	**0.027**
PFESA-BP2	UG/L	**0.29**	**0.35**	**0.25**	**0.28**	**0.3**	**0.35**	**0.035**	**0.25**	**0.31**	**0.33**	**0.36**
PFMOAA	UG/L	**67**	**91**	**75 J**	**88**	**84**	**108**	**0.62**	**71**	**105**	**106**	**82**
PFO2HxA	UG/L	**16**	**18**	**17**	**18**	**19**	**19**	**1.3**	**17**	**17**	**17**	**20**
PFO3OA	UG/L	**4.2**	**4.6**	**4.2**	**4.4**	**4.6**	**5**	**0.25**	**4**	**4.4**	**4.7**	**5**
PFO4DA	UG/L	**1.3**	**1.7**	**1.4**	**1.5**	**1.5**	**1.4**	<0.079	**1.3**	**1.1**	**1.3**	**1.5**
PFO5DA	UG/L	**0.62**	**0.86**	**0.66**	**0.68**	**0.74**	**0.58**	<0.034	**0.63**	**0.49**	**0.53**	**0.71**
PMPA	UG/L	**5.8**	**5.7**	**5.9**	**5.4**	**6.3**	**5**	**3.5**	**5.5**	**4.8**	**4.9**	**5.7**
R-EVE	UG/L	<0.14	<0.14	**0.17**	<0.14	**0.16**	**0.17**	**0.13**	**0.15**	<0.070	**0.19 J**	**0.25**

Notes:
NR = Not Reported
< = Not detected above the method detection limit
J = Estimated value
UJ = Not detected (estimated detection limit)
Detected results are presented in bold type

TABLE 1

Old Outfall 002 Monthly Sampling Results
Chemours Fayetteville Works
Fayetteville, North Carolina

Location ID		OLDOF-C					OLDOF-C2			OLDOF-CREEK-A2		
Date Sampled		03/21/2019	03/21/2019	04/17/2019	05/15/2019	05/15/2019	03/21/2019	04/17/2019	05/15/2019	03/21/2019	04/17/2019	05/15/2019
Sample Purpose		FS	DUP	FS	FS	DUP	FS	FS	FS	FS	FS	FS
Parameter Name	Units	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
537 Modified												
Perfluorobutane Sulfonic Acid	UG/L	**0.0021**	**0.0021**	**0.002**	**0.0024**	**0.0023**	**0.0023**	**0.0024**	**0.0028**	<0.0020	<0.0020	<0.0020
Perfluorobutanoic Acid	UG/L	**0.12**	**0.12**	**0.12**	**0.11**	**0.12**	**0.11**	**0.11**	**0.11**	**0.026**	**0.029**	**0.03**
Perfluorodecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	**0.0021**	<0.0020	<0.0020	<0.0020	**0.0026**	<0.0020	<0.0020	<0.0020
Perfluorododecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroheptanoic Acid	UG/L	**0.035**	**0.035**	**0.035**	**0.038**	**0.036**	**0.035**	**0.035**	**0.037**	**0.0067**	**0.0083**	**0.0073**
Perfluorohexane Sulfonic Acid	UG/L	**0.0025**	**0.0026**	**0.0025**	**0.0026**	**0.0026**	**0.0025**	**0.0027**	**0.0027**	<0.0020	<0.0020	<0.0020
Perfluorohexanoic Acid	UG/L	**0.022**	**0.021**	**0.022**	**0.023**	**0.024**	**0.02**	**0.02**	**0.02**	**0.0043**	**0.0052**	**0.0054**
Perfluorononanoic Acid	UG/L	**0.013**	**0.013**	**0.012**	**0.023 J**	**0.016 J**	**0.014**	**0.014**	**0.022**	<0.0020	<0.0020	<0.0020
Perfluoropentanoic Acid	UG/L	**0.2**	**0.2**	**0.19**	**0.19**	**0.19**	**0.2**	**0.19**	**0.18**	**0.033**	**0.037**	**0.037**
Perfluoroundecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
PFOA	UG/L	**0.048**	**0.048**	**0.047**	**0.054**	**0.053**	**0.053**	**0.052**	**0.066**	**0.036**	**0.036**	**0.035**
PFOS	UG/L	**0.0034**	**0.0034**	**0.0035**	**0.0067 J**	**0.0048**	**0.004**	**0.0043**	**0.0074**	<0.0020	<0.0020	<0.0020
Hfpo Dimer Acid	UG/L	**12.0 J**	**9.8 J**	**10**	**10**	**11**	**8.3**	**11**	**7.7**	**2.5**	**3**	**2.9**
Perfluorodecane Sulfonic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorotetradecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorotridecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
10:2 Fluorotelomer sulfonate	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
6:2 Fluorotelomer sulfonate	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
ADONA	UG/L	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
F-53B Major	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
F-53B Minor	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
N-ethyl perfluorooctane sulfonamidoacetic acid	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
N-methyl perfluorooctane sulfonamidoacetic acid	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
NaDONA	UG/L	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
Perfluorododecane sulfonic acid (PFDoS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroheptane sulfonic acid (PFHpS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorohexadecanoic acid (PFHxDA)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorononanesulfonic acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctadecanoic acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctane Sulfonamide	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentane sulfonic acid (PFPeS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020

Notes:
NR = Not Reported
< = Not detected above the method detection limit
J = Estimated value
UJ = Not detected (estimated detection limit)
Detected results are presented in bold type

TABLE 1

Old Outfall 002 Monthly Sampling Results
Chemours Fayetteville Works
Fayetteville, North Carolina

Location ID		OLDOF-C					OLDOF-C2			OLDOF-CREEK-A2		
Date Sampled		03/21/2019	03/21/2019	04/17/2019	05/15/2019	05/15/2019	03/21/2019	04/17/2019	05/15/2019	03/21/2019	04/17/2019	05/15/2019
Sample Purpose		FS	DUP	FS	FS	DUP	FS	FS	FS	FS	FS	FS
Parameter Name	Units	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Cl. Spec. Table 3 Compound SOP												
N-ethylperfluoro-1-octanesulfonamide	UG/L	<0.075 UJ	<0.075 UJ	<0.037	<0.075	<0.075	<0.075 UJ	<0.037	<0.037	<0.037 UJ	<0.037	<0.037
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	UG/L	<0.12	<0.12	<0.060 UJ	<0.12	<0.12	<0.12	<0.060	<0.060	<0.060	<0.060 UJ	<0.060
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	UG/L	<0.22	<0.22	<0.11	<0.22	<0.22	<0.22	<0.11	<0.11	<0.11	<0.11	<0.11
Byproduct 4	UG/L	**0.54**	**0.51**	**0.65**	**0.61**	**0.67**	**0.55**	<0.16	**0.73**	<0.16	**0.16**	<0.16
Byproduct 5	UG/L	**1.3 J**	**1.3**	**1.5**	**2.4**	**2.4**	**1.2 J**	<0.058	**2.1**	<0.058 UJ	<0.058	<0.058
Byproduct 6	UG/L	<0.031	<0.031	**0.024**	<0.031	<0.031	<0.031	**0.022**	**0.036**	<0.015	<0.015	<0.015
EVE Acid	UG/L	<0.049	<0.049	**0.025**	<0.049	<0.049	**0.082**	**0.061**	**0.078**	<0.024	<0.024	<0.024
Hydro-EVE Acid	UG/L	**0.29**	**0.26**	**0.31**	**0.39**	**0.36**	**0.26**	**0.26**	**0.37**	<0.028	<0.028	<0.028
N-methyl perfluoro-1-octanesulfonamide	UG/L	<0.069	<0.069	<0.035	<0.069	<0.069	<0.069	<0.035	<0.035	<0.035	<0.035	<0.035
NVHOS	UG/L	**1.3**	**1.2**	**1.3**	**1.3**	**1.3**	**1.2**	**1.3**	**1.3**	<0.054	<0.054	<0.054
PEPA	UG/L	**2.6**	**2.5**	**2.5**	**2.3**	**2.4**	**2.4**	**2.4**	**2.1**	**1.1**	**1.2**	**1.1**
PES	UG/L	<0.092	<0.092	<0.046	<0.092	<0.092	<0.092	<0.046	<0.046	<0.046	<0.046	<0.046
PFECA B	UG/L	<0.12	<0.12	<0.060	<0.12	<0.12	<0.12	<0.060	<0.060	<0.060	<0.060	<0.060
PFECA-G	UG/L	<0.082	<0.082	<0.041	<0.082	<0.082	<0.082	<0.041	<0.041	<0.041	<0.041	<0.041
PFESA-BP1	UG/L	**0.29**	**0.25**	**0.25**	**0.14**	**0.16**	**0.77**	**0.64**	**0.75**	<0.027	<0.027	<0.027
PFESA-BP2	UG/L	**0.45**	**0.43**	**0.49**	**0.65**	**0.54**	**0.43**	**0.47**	**0.65**	**0.082**	**0.1**	**0.12**
PFMOAA	UG/L	**137**	**120 J**	**152**	**150**	**147**	**151**	**139**	**147**	**0.44**	**0.74**	**0.57**
PFO2HxA	UG/L	**29**	**28**	**29**	**29**	**31**	**30**	**30**	**29**	**1.6**	**1.8**	**1.9**
PFO3OA	UG/L	**7.2**	**7.2**	**7.8**	**7.6**	**8**	**7.1**	**8.5**	**7.7**	**0.21**	**0.28**	**0.28**
PFO4DA	UG/L	**2.4**	**2.3**	**2.4**	**2.9**	**2.9**	**2.5**	**2.8**	**3**	**0.15**	**0.17**	**0.2**
PFO5DA	UG/L	**1.1**	**1**	**0.9**	**1.7**	**1.3 J**	**1.4**	**1.1**	**2.3**	<0.034	<0.034	<0.034
PMPA	UG/L	**7.4**	**7.4**	**6.4**	**7**	**7.2**	**6.9**	**6.7**	**6.7**	**3.2**	**2.6**	**3.3**
R-EVE	UG/L	**0.24**	**0.19**	**0.2**	**0.14**	<0.14	**0.18**	<0.070	**0.31**	<0.070	**0.086**	**0.12**

Notes:
NR = Not Reported
< = Not detected above the method detection limit
J = Estimated value
UJ = Not detected (estimated detection limit)
Detected results are presented in bold type

TABLE 1

Old Outfall 002 Monthly Sampling Results
Chemours Fayetteville Works
Fayetteville, North Carolina

Location ID		OLDOF-D			OLDOF-E		
Date Sampled		03/21/2019	04/17/2019	05/15/2019	03/21/2019	04/17/2019	05/15/2019
Sample Purpose		FS	FS	FS	FS	FS	FS
Parameter Name	Units	Result	Result	Result	Result	Result	Result
537 Modified							
Perfluorobutane Sulfonic Acid	UG/L	**0.0041**	**0.004**	**0.0041**	**0.0059**	**0.0059**	**0.0065**
Perfluorobutanoic Acid	UG/L	**0.13**	**0.13**	**0.13**	**0.16**	**0.16**	**0.16**
Perfluorodecanoic Acid	UG/L	<0.0020	<0.0020	**0.0025**	**0.0026**	**0.0021**	**0.0042**
Perfluorododecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroheptanoic Acid	UG/L	**0.045**	**0.043**	**0.047**	**0.061**	**0.062**	**0.063**
Perfluorohexane Sulfonic Acid	UG/L	**0.0035**	**0.0035**	**0.003**	**0.0039**	**0.0038**	**0.0036**
Perfluorohexanoic Acid	UG/L	**0.024**	**0.025**	**0.024**	**0.031**	**0.031**	**0.035**
Perfluorononanoic Acid	UG/L	**0.021**	**0.021**	**0.031**	**0.034**	**0.035**	**0.05**
Perfluoropentanoic Acid	UG/L	**0.24**	**0.23**	**0.21**	**0.34**	**0.32**	**0.31**
Perfluoroundecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
PFOA	UG/L	**0.068**	**0.066**	**0.069**	**0.08**	**0.084**	**0.097**
PFOS	UG/L	**0.0059**	**0.0062**	**0.0088**	**0.01**	**0.011**	**0.014**
Hfpo Dimer Acid	UG/L	**19**	**11**	**11**	**17**	**20**	**10**
Perfluorodecane Sulfonic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorotetradecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorotridecanoic Acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
10:2 Fluorotelomer sulfonate	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
6:2 Fluorotelomer sulfonate	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
ADONA	UG/L	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
F-53B Major	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
F-53B Minor	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
N-ethyl perfluorooctane sulfonamidoacetic acid	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
N-methyl perfluorooctane sulfonamidoacetic acid	UG/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
NaDONA	UG/L	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
Perfluorododecane sulfonic acid (PFDoS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoroheptane sulfonic acid (PFHpS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorohexadecanoic acid (PFHxDA)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorononanesulfonic acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctadecanoic acid	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluorooctane Sulfonamide	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentane sulfonic acid (PFPeS)	UG/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020

Notes:
NR = Not Reported
< = Not detected above the method detection limit
J = Estimated value
UJ = Not detected (estimated detection limit)
Detected results are presented in bold type

TABLE 1

Old Outfall 002 Monthly Sampling Results
Chemours Fayetteville Works
Fayetteville, North Carolina

Location ID		OLDOF-D			OLDOF-E		
Date Sampled		03/21/2019	04/17/2019	05/15/2019	03/21/2019	04/17/2019	05/15/2019
Sample Purpose		FS	FS	FS	FS	FS	FS
Parameter Name	Units	Result	Result	Result	Result	Result	Result
Cl. Spec. Table 3 Compound SOP							
N-ethylperfluoro-1-octanesulfonamide	UG/L	<0.075 UJ	<0.037	<0.037	<0.075 UJ	<0.075 UJ	<0.056
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	UG/L	<0.12	<0.060 UJ	<0.060	<0.12	<0.12 UJ	<0.090
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	UG/L	<0.22	<0.11	<0.11	<0.22	<0.22	<0.16
Byproduct 4	UG/L	**0.73**	**0.62**	**0.77**	**0.81**	**0.6**	**0.99**
Byproduct 5	UG/L	**1.8 J**	**1.6**	**2.8**	**2.5 J**	**2.1**	**4.2**
Byproduct 6	UG/L	<0.031	**0.037**	**0.041**	**0.035**	**0.031**	**0.043**
EVE Acid	UG/L	**0.3**	**0.29**	**0.33**	**0.5**	**0.31**	**0.52**
Hydro-EVE Acid	UG/L	**0.4**	**0.43**	**0.48**	**0.52**	**0.37**	**0.59**
N-methyl perfluoro-1-octanesulfonamide	UG/L	<0.069	<0.035	<0.035	<0.069 UJ	<0.069 UJ	<0.052
NVHOS	UG/L	**1.5**	**1.5**	**1.4**	**1.8**	**1.3**	**1.8**
PEPA	UG/L	**2.6**	**2.7**	**2.5**	**2.7**	**2**	**2.4**
PES	UG/L	<0.092	<0.046	<0.046	<0.092	<0.092	<0.069
PFECA B	UG/L	<0.12	<0.060	<0.060	<0.12	<0.12	<0.090
PFECA-G	UG/L	<0.082	<0.041	<0.041	<0.082	<0.082	<0.061
PFESA-BP1	UG/L	**2.6**	**2.6**	**2.8**	**5.5**	**4**	**5.5**
PFESA-BP2	UG/L	**0.64**	**0.65**	**0.77**	**0.85**	**0.65**	**0.99**
PFMOAA	UG/L	**167**	**180**	**177**	**215**	**143**	**241**
PFO2HxA	UG/L	**37**	**35**	**35**	**46**	**31**	**47**
PFO3OA	UG/L	**9.5**	**9.8**	**9.2**	**12**	**9.5**	**12**
PFO4DA	UG/L	**3.5**	**3.5**	**3.9**	**4.9**	**3.6**	**5.7**
PFO5DA	UG/L	**2**	**1.6**	**3.3**	**3.1**	**2**	**4.3**
PMPA	UG/L	**8**	**6.8**	**7.6**	**8.6**	**5.9**	**7.9**
R-EVE	UG/L	**0.26**	**0.22**	**0.32**	**0.28**	**0.21**	<0.11

Notes:
NR = Not Reported
< = Not detected above the method detection limit
J = Estimated value
UJ = Not detected (estimated detection limit)
Detected results are presented in bold type