ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IN THE MATTER OF: **3M Company, Inc.** **3M Decatur Facility** **1400 State Docks Road** **Decatur, Morgan County, Alabama** **NPDES PERMIT NO. AL0000205**	Consent Order No. 20-086-CWP/AP/GW/HW/DW/SW

PREAMBLE

This Interim Special Order by Consent ("Interim Consent Order") is made and entered into by the Alabama Department of Environmental Management ("Department" or "ADEM"), in consultation with the United States Environmental Protection Agency ("EPA"), and 3M Company, Inc. ("3M"), pursuant to the provisions of the: Alabama Environmental Management Act ("AEMA"), Ala. Code §§ 22-22A-1 to 22-22A-17, as amended; Alabama Water Pollution Control Act ("AWPCA"), Ala. Code §§ 22-22-1 to 22-22-14, as amended, and the Federal Water Pollution Control Act ("CWA"), 33 U.S.C. §§ 1251 to 1388; Alabama Air Pollution Control Act ("AAPCA"), Ala. Code §§ 22-28-1 to 22-28-23, as amended, and the federal Clean Air Act ("CAA"), 42 U.S.C. §§ 7401 to 7671q, as amended; Alabama Hazardous Wastes Management and Minimization Act ("AHWMMA"), Ala. Code § 22-30-1 to 22-30-24, as amended; federal Solid Waste Disposal Act ("SWDA"), 42 U.S.C. §§ 6901 to 6979b, and; Alabama Safe Drinking Water Act of 1977 ("ASDWA"), Ala. Code §§ 22-23-30 et seq., and the federal Public Health Service Act ("Safe Drinking Water Act" or "SDWA"), 42 U.S.C. §§ 300f to 300j-26, as amended, and the regulations promulgated pursuant to the aforementioned statutes.

STIPULATIONS

1. 3M operates a film and chemical manufacturing plant commonly known as the 3M Decatur Facility ("Facility"), located at 1400 State Docks Road, in Decatur, Morgan County, Alabama. See Figure 1 ("Site Map").

2. The Department is a duly constituted department of the State of Alabama pursuant to the AEMA.

3. For purposes of this agreement, the term "Parties" shall refer to 3M and the Department, collectively.

4. Pursuant to Ala. Code § 22-22A-4(n), as amended, the Department is the state agency responsible for the promulgation and enforcement of water pollution control regulations in accordance with the CWA. In addition, the Department is authorized to administer and enforce the provisions of the AWPCA.

5. Pursuant to Ala. Code §§ 22-22A-4(n), as amended, the Department is the state air pollution control agency for the purposes of the CAA. In addition, the Department is authorized to administer and enforce the provisions of the AAPCA.

6. Pursuant to Ala. Code § 22-22A-4(n), the Department is the state agency responsible for the promulgation and enforcement of solid and hazardous waste regulations in accordance with the federal SWDA. In addition, the Department is authorized to administer and enforce the provisions of the AHWMMA, Ala. Code §§ 22-30-1 to 22-30-24, as amended.

7. Pursuant to Ala. Code §§ 22-22A-4(n), the Department is the state agency responsible for the promulgation and enforcement of drinking water regulations in accordance with the Safe Drinking Water Act. Additionally, pursuant to Ala. Code § 22-23-49(2), as amended, the Department is authorized to administer and enforce the provisions of the ASDWA.

8. Per- and polyfluoroalkyl substances ("PFAS") are pollutants in accordance with the AWPCA and the AAPCA and include, but are not limited to the PFAS, among others, identified in Attachments 1, 1A, and 2, including the PFAS specifically identified in Paragraphs 9 through 13.

9. "FBSA" refers to the compound 1,1,2,2,3,3,4,4,4-Nonafluorobutane-1-sulfonamide, Chemical Abstract Service Registry Number 30334-69-1.

10. "FBSE" refers to the compound 1,1,2,2,3,3,4,4,4-Nonafluoro-N-(2-hydroxyethyl)-1-butanesulfonamide, Chemical Abstract Service Registry Number 34454-99-4.

11. "FBSEE" refers to the compound 1,1,2,2,3,3,4,4,4-Nonafluoro-N,N-bis(2-

hydroxyethyl)butane-1-sulfonamide, Chemical Abstract Service Registry Number 34455-00-0.

12. "PFOA" refers to the compound perfluorooctanoic acid, Chemical Abstract Service Registry Number 335-67-1.

13. "PFOS" refers to the compound perfluorooctane sulfonate, Chemical Abstract Service Registry Number 1763-23-1.

14. "SOF" refers to soluble organic fluoride also known as total organic fluoride, which for purposes of this Interim Consent Order is a measure of the amount or concentration of organic fluoride in aqueous sample as measured using a combustion ion chromatography technique.

15. As of the date of this Interim Consent Order, there are no established regulatory numeric standards applicable in Alabama for PFAS releases into the environment under State law or under the CWA, SWDA, SDWA or the CAA.

16. 3M began to phase-out the manufacturing, processing and use of PFOA and PFOS at the Facility beginning in 2000. Production of PFOS and PFOA ceased at the Facility by the end of 2002, and usage of PFOS and PFOA was largely eliminated by 2004.

17. The Department reissued National Pollutant Discharge Elimination System ("NPDES") Permit No. AL0000205 ("Permit") to 3M on February 28, 2014, effective March 1, 2014, and modified June 9, 2014, establishing effluent limitations on the discharge of pollutants from point sources, designated therein as Outfall Numbers DSN001 – DSN004, to the Tennessee River, DSN005 – DSN006, to Bakers Creek, and DSN007 – DSN013, into an Unnamed Tributary to Bakers Creek, all of which are waters of the State. The Permit, which had an expiration date of February 28, 2019, has been administratively extended, and requires that 3M monitor its Facility discharges and submit periodic discharge monitoring reports ("DMRs") to the Department describing the results of the monitoring. In addition, the Permit requires that 3M properly operate and maintain all facilities and systems of treatment and control which are installed or used by 3M to achieve compliance with the conditions of the Permit.

18. Permit Condition I.A. requires that discharges of certain pollutants be limited and monitored as specified in the Permit. Since 2007, the Permit has required that 3M monitor for

the presence of certain PFAS (including but not limited to FBSA, PFOA, and PFOS) in its discharges from permitted Outfall Nos. DSN001 – DSN012. The Permit (and earlier versions of the Permit) does not include numeric effluent limitations for the specific PFAS listed therein.

19. DMRs submitted to the Department by 3M since October 2015, indicate that 3M has on three discrete occasions had a pollutant in its discharge above numeric permit limits -- chloroform (on one occasion) and chromium (on two occasions for the same day) in excess of the numeric effluent limits for those pollutants imposed by Part I.A. of the Permit. ADEM alleges that 3M violated the three numeric effluent limitations listed in Attachment 3.

20. Permit Condition I.C. requires that monitored results required by the Permit be reported on DMRs. Permit Condition I. C.1.d. states that: "[a]ll reports and forms required to be submitted by this permit, the AWPCA and the Department's Rules, shall be electronically signed (or, if allowed by the Department, traditionally signed) by a 'responsible official' of the permittee as defined in ADEM Admin. Code r. 335-6-6-.09 or a 'duly authorized representative' of such official as defined in ADEM Admin. Code r. 335-6-6-.09 and shall bear the following certification:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Permit Condition I.D.3.b states "[i]f the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information with a written explanation for the mistake and/or omission." 3M submitted certain monitoring results on DMRs for the period March 2015 through April 2016, which were not consistent with actual results as indicated on laboratory records. 3M reported these errors to the Department on June 19, 2019, and followed-up in writing in a September 10, 2019 letter. ADEM alleges that 3M therefore violated Permit Condition I.C. and Permit Condition I.D.3.b.

21. The Permit was modified on April 26, 2012, requiring PFAS monitoring results in the units of ug/l, rather than mg/l, beginning on May 1, 2012. As indicated in 3M's April 25, 2017 letter, from 2012 through 2016, 3M continued to report PFAS monitoring results for the Facility in units of mg/l, which were then entered into ADEM's system without converting the results to ug/l. 3M corrected this issue in April 2017, in consultation with ADEM, after ADEM notified 3M of the mis-reported monitoring results in 2016.

22. On June 18 and 19, 2019, 3M disclosed to EPA and ADEM, respectively, that between March 2015 and April 2016, it had submitted DMRs, which included incorrectly reported data, and that the correct data showed only one instance of non-compliance by Decatur of its NPDES permit. 3M submitted corrected DMRs on August 1, 2019.

23. On June 24 through 26, 2019, ADEM and EPA, conducted a joint Compliance Evaluation Inspection ("CEI") at the Facility. In conjunction with the CEI, EPA collected samples from 3M's wastewater treatment influent and effluent as well as from outfalls associated with industrial stormwater. As described in more detail in the inspection report, among other items, the following items were noted in the September 12, 2019 EPA report, which was transmitted to the Department on September 19, 2019:

a. The Parshall flume wall for DSN001 was bulging approximately one inch from the concrete wall at the convergence of the flume. The side wall of the Parshall flume associated with outfall DSN001 appeared to be warping;

b. Heavy solids build-up was observed on the V-notch weirs and in the catch basins in both primary clarifiers, effectively clogging the weirs. Plant growth was also observed growing in the weir catch basins for both clarifiers;

c. The Advent® Integrated Systems ("AIS") tanks appeared operational but in need of cleaning and preservation;

d. The V-notch weirs in the primary clarifiers were slightly out of level in various locations surrounding the clarifier tanks; and

e. The gravity thickener tank weirs were heavily clogged with solids, and excessive plant growth was observed in and around the settling tank, weir and catch basin.

24. On June 24 through 26, 2019, ADEM and EPA also conducted a Compliance Stormwater Evaluation Inspection (CSWEI), which focused on the Permit's stormwater discharge requirements. The items and observations noted during the inspection are detailed in EPA's November 12, 2019 "Stormwater Compliance Evaluation Inspection Report" (Stormwater Inspection Report).

25. On May 21, 2020, 3M submitted a letter to the Department describing the status of the actions that 3M has taken to address the items and observations outlined in the CEI and CSWEI inspection reports referenced in Paragraphs 23 and 24.

26. Permit Condition II.A.1 states that "[t]he Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures." The Department alleges that 3M violated Permit Condition II.A.1 as described in Paragraph 23 of this Interim Consent Order.

27. ADEM Admin. Code r. 335-6-6-.03(1) states "[n]o person shall discharge pollutants into waters of the state without first having obtained a valid NPDES permit or coverage under a valid General NPDES Permit." Permit Condition II.B.1. states "[t]he permittee has a duty to mitigate adverse impacts, and shall promptly take all reasonable steps to mitigate and minimize or prevent any adverse impact on human health and the environment resulting from noncompliance with any discharge limitation specified in Provision I.A. of this permit, including such accelerated or additional monitoring of the discharge and/or the receiving waterbody as necessary to determine the nature and impact of the noncomplying discharge." Permit Condition II.D.1.c states "[t]he discharge of a pollutant from a source not specifically identified in the permit application for this permit and not specifically included in the description of an outfall in this permit is not authorized and shall constitute noncompliance with this permit. Permit Condition II.D.1.d states "[t]he permittee shall take all reasonable steps, including cessation of production or other activities, to minimize or prevent any violation of this permit or to minimize or prevent

any adverse impact of any permit violation." ADEM alleges that 3M did not disclose FBSEE as a potential pollutant in an NPDES permit application. 3M disclosed to EPA and ADEM on April 3, 2019 and April 4, 2019, respectively, that FBSEE may be in its discharge. Subsequent to 3M's disclosure, sampling results indicate that FBSEE, among other unauthorized PFAS, were present in 3M's discharge to the Tennessee River, a water of the State, which the Department alleges is a violation of ADEM Admin. Code r. 335-6-6-.03(1) and the Permit.

28. 3M is authorized to manufacture, process and use FBSA and FBSEE at the Decatur Facility pursuant to the terms of a November 3, 2009 "Consent Order and Determinations Supporting Consent Order," issued pursuant to Section 5(e) of the Toxic Substances Control Act ("TSCA Consent Order"), in which EPA identifies FBSA as P09-0477 and FBSEE as P09-0485. The TSCA Consent Order applies "to all commercial manufacturing, processing, distributing in commerce, use and disposal of [FBSA as P-09-0477 and FBSEE as P-09-0485] except to the extent that those activities are exempted. . . ." The "byproduct" exemption of the TSCA Consent Order states that the "requirements of this Order do not apply to [FBSA as P-09-0477 and FBSEE as P-09-0485] when it is produced, without separate commercial intent, only as a 'byproduct' as defined in 40 CFR 720.3(d) and in compliance with 40 CFR 720.30(g)." The TSCA Consent Order contains a provision titled "Release to Water", which states as follows: "The Company is prohibited from any predicted or purposeful release of the PMN substances [FBSA] P-09-0477 and [FBSEE] P-09-0485, or any waste stream from manufacturing, process and use containing these substances into waters of the United States." On April 3, 2019, 3M disclosed to EPA that the Facility released FBSA and may have released FBSEE from the TSCA-regulated manufacturing processes to the Tennessee River in non-compliance with the TSCA Consent Order's release to water provision.

29. 3M is authorized to manufacture, process and use FBSE at the Decatur Facility pursuant to the terms of a Section 5(e) Consent Order and Determination Supporting Consent Order, dated March 13, 2014 ("FBSE Consent Order"), and pursuant to the terms of a Significant New Use Rule (SNUR), dated October 27, 2014 (79 Fed. Reg. 63835). Neither the March 13, 2014 Consent Order nor the SNUR include a release to water restriction or prohibition.

30. The AWPCA, and the regulations promulgated thereto, prohibit the discharge of any new or increased pollution into any waters of the State without a permit. Ala. Code § 22-22-9(i)(3).

31. Waste materials originating from the 3M Facility have been discovered at various sites throughout northwestern Alabama, including, but not limited to the: "Browns Ferry Road Site" located immediately north of Lawrence County Road 387 approximately 0.5 miles west of the intersection with Lawrence County Road 400; "County Road 222 Site" located at 7644 County Road 222 in Trinity, Lawrence County, Alabama; "Johnson Landfill" located at 2803 County Road 258, Trinity, Lawrence County, Alabama; "County Road 455 Site" located at 266 County Road 455, Hillsboro, Lawrence County, Alabama; "County Road 377 Site" located in Trinity, Lawrence County; "County Road 41 Site" located northwest of the intersection of Danville Road (County Road 41) and San Souci Cave Road, Morgan County, Alabama; "Chapel Hill Road Site" located at the intersection of W Chapel Hill Road and George Russell Road, Decatur, Alabama; "Old Trinity Road Site" located near the intersection of Old Trinity Road and Woodall Rd SW, Decatur, Alabama; "Seneca Drive Site" located near 1000 N Seneca Drive, Trinity, Lawrence County, Alabama; "Brookhaven Landfill" located at 5th Avenue SW, Decatur, Alabama; "Deer Springs Landfill" located on Deer Springs Road, Decatur, Alabama; and "Old Moulton Road Landfill" located on Old Moulton Road, Decatur, Alabama. These and any future similar sites are hereinafter referred to as "offsite areas."

32. Monitoring data collected by 3M indicates that certain PFAS have been detected in groundwater underlying the Browns Ferry Road Site, the County Road 222 site, and the Facility.

33. 3M and ADEM entered into an "NPDES Remedial Action Agreement Between Alabama Department of Environmental Management and 3M Company Montgomery County, Alabama NPDES Permit No. AL0000205," dated June 27, 2008 ("NPDES Remedial Action Agreement"), to provide a mechanism for the performance and oversight of remediation activities in the former sludge incorporation area ("FSIA") located at the Facility. The NPDES Remedial Action Agreement states as follows: "based on the engineering, regulatory, and economic

analysis of the various remediation options available, 3M and ADEM have mutually agreed that a multilayer cap over the FSIA with groundwater migration controls and treatment is the preferred remediation option. 3M also commits to installing a monitoring well network, performing periodic sampling and analysis, relocating certain on-site sludges and off-site residual material to be capped at the FSIA, and providing for appropriate restoration of the FSIA." The remediation activities related to relocation of on-site sludge and off-site residual materials to the FSIA, and the installation and restoration of the FSIA cap, are substantially complete. The groundwater monitoring well network has been installed, and periodic sampling and analyses of groundwater is conducted on a routine basis with the results of the sampling and analyses effort submitted to ADEM at least annually. 3M's remediation activities under the NPDES Remedial Action Agreement related to groundwater migration controls and treatment for the FSIA are ongoing. Those activities will be completed pursuant to the terms of the requirements of this Interim Consent Order. The NPDES Remedial Action Agreement will be closed-out by mutual agreement of the Parties upon the effective date of the Interim Consent Order. 3M will install the FSIA groundwater migration controls and treatment pursuant to a plan and schedule approved by ADEM in accordance with Paragraph F.3.

34. Monitoring data collected by 3M pursuant to the NPDES Remedial Action Agreement indicates that PFAS have been released to the groundwater underlying the Facility.

OBJECTIVES

35. It is the express purpose of the Parties entering into this Interim Consent Order to further the objectives set forth in the AEMA, AWPCA, AAPCA, AHWMMA, ASDWA, CWA, CAA, RCRA, and SDWA. In light of these objectives, 3M agrees, among other things, to: cause the expeditious implementation of the "Interim Consent Order – Compliance Plan" as herein set forth and, in accordance with the schedules included in this Interim Consent Order; take all appropriate steps necessary to comply with its Permit; to enhance the "Perfluorinated Compound (PFC) Reduction Plan," developed pursuant to the NPDES Permit, modified on September 30, 2009, and subsequently modified on April 26, 2012; and to reduce PFAS released to and present in the environment. The Parties acknowledge that 3M may need to perform additional

investigation and remedial actions, and that this agreement is interim in nature, and that the Department reserves its rights to require additional remedial and/or other actions, and to seek penalties. The Department has determined that the terms contemplated in this Interim Consent Order are in the best interests of the citizens of Alabama and should result in significant reductions of PFAS in the environment. In any subsequent proceeding for injunctive relief, recovery of response costs, or other relief relating to the Facility, 3M shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised in the subsequent proceeding were or should have been brought in the instant action. 3M admits that the Department has jurisdiction over the subject matter of this Interim Consent Order, and consents to abide by its terms without the admission of any issue of fact or conclusion of law.

36. The Department agrees to use its best efforts to expeditiously evaluate permit applications and review all documents, plans, and other deliverables that 3M is required to submit pursuant to the terms and conditions of this Interim Consent Order.

INTERIM CONSENT ORDER - COMPLIANCE PLAN

37. THEREFORE, 3M, along with the Department, in consultation with EPA, desire to achieve and ensure compliance with applicable regulations and requirements, enhance the existing required Perfluorinated Compound (PFC) Reduction Plan, identify areas with potential PFAS contamination, remediate as necessary to reduce PFAS in the environment, and to undertake voluntary study programs as set forth in Paragraphs I, J, and K to enhance the Department's and public's knowledge of PFAS. The Department has carefully considered the facts available to it, as well as the need for additional investigations, studies and enhancements, and the Department believes that the following conditions are appropriate to further the objectives of the AEMA, AWPCA, AAPCA, AHWMMA, ASDWA, CWA, CAA, SWDA, and SDWA. Therefore, the Parties agree to enter into this INTERIM CONSENT ORDER with the following terms and conditions:

A. NPDES Permit:

1. **Application:** 3M shall submit to the Department an updated NPDES Permit Application, not later than thirty (30) days after the effective date of this Interim Consent Order. The application shall include any applicable updates, including, but not limited to: the identity of any new outfalls, and the identity of the PFAS identified in Attachments 1, 1A, and 2 to this Interim Consent Order, which includes PFAS present at the Facility in raw materials, as precursors, in products, as by-products, or in the wastewater discharge to the wastewater treatment plant ("WWTP").

2. **DMR Audit:** 3M shall continue the process of verifying the accuracy of Facility wastewater data submitted in its monthly and quarterly DMRs. 3M shall retain a third party to conduct an audit of its DMRs, for a period of eight (8) consecutive calendar quarters beginning with the first full calendar quarter following the effective date of this Interim Consent Order, to ensure the accuracy of reported DMR values. If any errors are identified, 3M shall update the DMRs through the eDMR system and notify the Department not later than fifteen (15) days after the date of discovery of the error.

3. **Stormwater Best Management Practices:** Not later than one hundred and twenty (120) days after the effective date of this Interim Consent Order, 3M shall modify the Facility's stormwater best management practices ("BMP") plan to address the observations identified in EPA's Stormwater Inspection Report. The modified stormwater BMP plan should include additional specificity, including but not limited to, requirements for daily process area inspections, quarterly comprehensive stormwater-focused inspections including a review of DMR values and trends to assess levels of pollutants in stormwater discharges, and a tiered response approach to addressing inspection observations and elevated pollutant discharge values.

4. **Notification of Discharge:** 3M shall immediately notify the Department upon becoming aware of any violation of any TSCA Section 5(e) consent order or SNUR release to water restriction or prohibition of materials manufactured, processed or used at the Facility. The notification shall include the identity of the material discharged, the location of the discharge, the rate or quantity of the discharge, and the date and time of the discharge. Nothing in this

Interim Consent Order shall be construed to authorize the discharge of any pollutant in violation of a TSCA Section 5(e) consent order, or SNUR.

B. Wastewater Treatment Technology and Source Reduction:

1. **Granular Activated Carbon Treatment System**: Upon the effective date of this Interim Consent Order, 3M shall properly operate and maintain a granular activated carbon ("GAC") treatment system to treat all process wastewater discharged from the Facility (i.e., "WWTP GAC"). The WWTP GAC shall be designed, maintained, and operated to meet the concentration-based performance standard set forth in Paragraph C.3.a.i. The WWTP GAC may be subject to a more stringent concentration-based performance standard based upon the Department accepted results of the carbon bed breakthrough study required by Paragraph C.3.b of this Interim Consent Order.

2. **Fluoroelastomer Pretreatment Granular Activated Carbon System:** Upon the effective date of this Interim Consent Order, 3M shall properly operate and maintain a GAC pretreatment system to treat all process wastewater from the fluoroelastomer washing process ("Fluoroelastomer GAC"). The Fluoroelastomer GAC shall be designed, operated, and maintained to meet the concentration-based performance standard set forth in Paragraph C.3.a.ii. The Fluoroelastomer GAC may be subject to a more stringent concentration-based performance standard based upon the Department accepted results of the carbon bed breakthrough study required by Paragraph C.3.b of this Interim Consent Order.

3. **Cooling Water Recycle System:** Not later than three hundred and sixty-five (365) days after the effective date of this Interim Consent Order, 3M shall install a cooling water recycle system and shall cease the discharge of all untreated non-contact cooling water, with the exceptions of bypasses or upsets as allowed under the NPDES Permit.

4. **Wastewater Minimization Plan:** 3M shall develop a wastewater minimization plan to further reduce PFAS discharged to the WWTP. The plan shall include a prioritized list of projects (with an implementation schedule) to minimize the discharge of PFAS from process operations and associated cleaning activities (e.g., cleaning of process equipment and reduction of associated wash water). 3M shall submit the wastewater minimization plan to the Department

for review not later than two hundred and seventy (270) days after the effective date of the Interim Consent Order. If the Department determines through its review that the plan is not sufficient, the Department shall notify 3M in writing of the basis(es) of its determination, and 3M shall modify the plan to address the Department's comments. 3M shall submit modifications to the plan, if required, so that they are received by the Department not later than sixty (60) days after the date of the receipt of the Department's comments. 3M shall implement the plan as accepted by the Department.

5. **Evaluation of Wastewater Pollution Control Technologies:** 3M shall conduct a feasibility study to evaluate wastewater pollution control technologies to mitigate or eliminate the discharge of PFAS. 3M shall evaluate the feasibility of one or a combination of the following technologies: granular activated carbon, reverse osmosis, ion-exchange, and a partial- or complete-closed loop system for the Decatur PFAS-related processes. As part of its feasibility study, 3M will evaluate for each of the wastewater pollution control technologies identified in this paragraph, *inter alia*, its technical feasibility, economic feasibility (including cost-effectiveness), energy consumption, and the potential for media shifting of pollutants. 3M shall submit the feasibility study to the Department not later than one hundred and twenty (120) days after the effective date of this Interim Consent Order. If the Department determines through its review of the submitted study that it is not sufficient, the Department shall notify 3M in writing of the basis(es) of its determination, and 3M shall modify the feasibility study to address the Department's comments. 3M shall submit modifications to the study, if required, so that they are received by the Department not later than sixty (60) days after receipt of the Department's comments. Not later than three hundred (300) days after the date of receipt of the Department's acceptance of the 3M feasibility study, 3M shall complete a pilot study of the technologies identified to be feasible in the Department-accepted feasibility study, and submit a report describing the results of the pilot study. The pilot study report should identify and describe the basis(es) of 3M's recommendation for the feasible technology(ies) it proposes to install and a schedule for the installation of those technology(ies). If the Department determines that the pilot study report including the proposed installation schedule is not sufficient, the Department shall

notify 3M in writing of the basis(es) of its determination, and 3M shall modify the proposed pilot study report and/or installation schedule to address the Department's comments. 3M shall submit the modified pilot study report and/or installation schedule, if required, so that it is received by the Department not later than sixty (60) days after receipt of the Department's comments. 3M shall install the selected technology(ies) in accordance with the Department's accepted installation schedule.

6. **Wastewater Treatment Plant Equipment Repair and Replacement:** 3M shall complete the corrective action listed below by not later than the identified dates:

a. Gravity thickener tank weir replacement: September 30, 2020;

b. Parshall flume wall rebuild: December 31, 2020;

c. Primary clarifier replacement:

i. Primary Clarifier North - January 31, 2021;

ii. Primary Clarifier South – December 31, 2020; and

d. Advent® Integrated Systems ("AIS") tanks removal from service December 31, 2020.

The above-identified dates for the completion of the above-listed WWTP corrective actions are based on what 3M understands to be the current condition of the above-listed WWTP equipment. 3M shall notify ADEM in writing should 3M determine that the conditions of the above-listed equipment necessitate additional work and require an extended schedule. 3M's notification should describe the additional work that it has determined is required and the specific basis(es) for its request for an extended schedule. A request for an extended schedule must be approved by the Department in writing. Not later than ninety (90) days after the completion of the latest repair identified above, 3M will submit to the Department documentation prepared by a professional engineer licensed to practice in the State of Alabama certifying that the above-listed corrective actions have been completed by the dates specified above. The certification required by this paragraph shall comport with the requirements of Paragraph M.5 of this Interim Consent Order.

C. Operation and Maintenance:

1. **Operation and Maintenance of GAC Systems:** Upon the effective date of this Interim Consent Order, 3M shall develop and implement standard operating procedures ("SOPs") for operation and maintenance of the WWTP GAC, Fluoroelastomer GAC, and the Groundwater GAC. Additionally, 3M shall revise its SOPs as necessary based on the results of the carbon bed breakthrough study.

2. **Operation and Maintenance of the WWTP:** Not later than one hundred and eighty (180) days after the effective date of this Interim Consent Order, 3M shall review and revise, if necessary, the operations and maintenance plan for the WWTP. Regular training regarding these procedures shall be conducted for personnel responsible for operations and maintenance of the WWTP.

3. **Carbon Bed Replacement**:

a. 3M shall replace the WWTP GAC, the Fluoroelastomer GAC, and the groundwater GAC carbons beds at a minimum frequency determined in reference to the below schedule, and in accordance with the SOPs for carbon bed operation and maintenance required by Paragraph C.1.

i. The lead carbon beds for the WWTP GAC shall be replaced when confirmed analytical data show the concentration of SOF after the lead bed is greater than or equal to 0.5 parts per million ("ppm" expressed as mg/l));

ii. The carbon beds for the Fluoroelastomer GAC shall be replaced when confirmed analytical data show the concentration of SOF in its effluent to the WWTP is greater than 3 ppm; and

iii. The Groundwater GAC system ("Groundwater GAC") carbon bed shall be replaced at least – annually.

3M may be required to increase the frequency that it changes carbon beds for the WWTP GAC, the Fluoroelastomer GAC, and the Groundwater GAC systems based upon results of the carbon

bed breakthrough study required by Paragraph C.3.b. of this Interim Consent Order as accepted by the Department.

b. Not later than sixty (60) days after the effective date of this Interim Consent Order, 3M shall develop and submit to the Department for acceptance a carbon bed breakthrough study plan for the WWTP GAC, the Fluoroelastomer GAC, and the Groundwater GAC. The breakthrough study plan for the WWTP GAC, Groundwater GAC, and the Fluoroelastomer GAC should describe how 3M will investigate and identify the optimal frequency of carbon bed replacement necessary to achieve and ensure a concentration-based performance standard of 0.2 ppm of SOF measured at DSN01A. As part of the breakthrough study, 3M will evaluate the WWTP GAC and Fluoroelastomer GAC performance during representative production operations to determine when breakthrough occurs for a period of twelve consecutive months. The breakthrough study should investigate and identify real-time monitoring technologies, if any, to measure WWTP GAC and Fluoroelastomer GAC efficiency. 3M agrees to implement a carbon bed replacement program based on the results of the breakthrough study upon its acceptance by the Department.

D. Wastewater Characterization:

1. **Wastewater Characterization Sampling Plan:** Not later than ninety (90) days after the effective date of this Interim Consent Order, 3M shall submit to the Department a wastewater characterization sampling plan which details the sampling required under Paragraphs D.2, D.3, and D.4 of this Section. The sampling plan should detail the sampling test methods and laboratory standards, the sample collection method(s), sampling frequency, and the location of each sample point. The sampling plan should identify all PFAS influent wastewater streams that could be monitored in the event that it is necessary to identify the source of PFAS in wastewater influent. If the Department determines through its review of the submitted sampling plan that the plan is not sufficient, the Department shall notify 3M in writing of the basis(es) of its determination, and 3M shall modify the plan to address the Department's comments. 3M shall submit modifications to the sampling plan, if required, so that they are received by the Department not later than thirty (30) days after receipt of the Department's

comments, or an alternate timeframe as approved by the Department, and 3M shall implement the sampling plan as accepted by the Department.

2. **Outfall Monitoring:** Upon the effective date of this Interim Consent Order, 3M shall monitor Facility process and stormwater NPDES outfall discharges for SOF and the PFAS identified in Attachments 1 and 2, and any other PFAS identified in Attachment 1A or later identified present at the Facility for which a reference standard and laboratory analytical method has been developed. In lieu of the sampling and analyses program currently underway at the Facility in cooperation with EPA and ADEM, 3M shall monitor DSN001 wastewater daily for SOF and monthly for the PFAS referenced in the preceding sentence. 3M shall monitor each stormwater outfall at a frequency of at least monthly for SOF and PFAS, provided that there is a qualifying rain event during the month. 3M may cease or reduce monitoring for a PFAS, upon approval by the Department in writing, should 3M demonstrate that: 1) for a period of twelve (12) consecutive months that a specific PFAS is not present in the Facility's influent and an outfall's monitored discharge, or 2) a specific PFAS is not associated with the Facility. Nothing in this Paragraph is intended to preclude the Parties from mutually agreeing in writing to modify the frequency of the sampling or the PFAS to be monitored.

3. **WWTP Influent Monitoring:** Upon the effective date of this Interim Consent Order, 3M shall initiate monitoring of the combined WWTP influent stream at a location after the equalization tanks sufficient for identifying and characterizing the influent sources of PFAS to the WWTP. 3M shall monitor the WWTP influent stream for SOF and the PFAS identified in Attachments 1 and 2, and any other PFAS identified in Attachment 1A for which a reference standard and laboratory analytical method has been developed. 3M may cease or reduce influent monitoring for a PFAS as required by the sampling plan approved pursuant to Paragraph D.1, upon acceptance by the Department in writing, should 3M demonstrate that: 1) for a period of twelve (12) consecutive months that a specific PFAS is not present in an influent stream, or 2) a specific PFAS is not associated with the Facility. Nothing in this Paragraph is intended to preclude the Parties from mutually agreeing in writing to modify the frequency or location of the sampling or the PFAS to be monitored.

4. **Cooling Water Intake Monitoring:** Upon the effective date of this Interim Consent Order, 3M shall monitor monthly the Facility's cooling water intake for SOF and the PFAS identified in Attachments 1 and 2, and any other PFAS identified in Attachment 1A, or later identified present at the Facility for which a reference standard and laboratory analytical method has been developed. Monitoring shall continue until the non-contact cooling water recycle system required by Paragraph B.3 of this Interim Consent Order is on-line and in operation. Thereafter, 3M may cease or reduce monitoring for a PFAS, upon approval by the Department in writing, should 3M demonstrate that: 1) for a period of twelve consecutive months a specific PFAS is not present in the cooling water intake, 2) a specific PFAS is not associated with the Facility, or 3) the Facility ceases the use of river water for production activities. Nothing in this Paragraph is intended to preclude the Parties from mutually agreeing in writing to modify the frequency of the sampling or the PFAS to be monitored.

E. Submission of Wastewater Monitoring Results:

1. The results of monitoring required pursuant to Paragraphs D.2, D.3 and D.4, except stormwater outfall monitoring, shall be submitted in .pdf and Excel or spreadsheet formats to the Department no later than the 28th day following the monitoring period, except as set forth in Paragraph E.2 or otherwise specified, in accordance with the requirements of Paragraph M (Reporting). The results of monitoring of the Decatur NPDES stormwater monitoring required by Paragraph D.2 shall be submitted in .pdf and Excel or spreadsheet formats to the Department no later than the 28th day of the second month following the monitoring period.

2. For the first calendar year of the Interim Consent Order, the results of monitoring required pursuant to Paragraphs D.2, D.3 and D.4 shall be submitted to the Department no later than the 28th day of the second month following the monitoring period in accordance with Paragraphs E and M.

3. EPA shall be notified of when the results of monitoring required pursuant to Paragraphs D.2, D.3 and D.4 are submitted to ADEM. These notifications shall be sent to EPA at the following address:

Chief, Drinking Water & Wastewater Section
Water Enforcement Branch
Enforcement & Compliance Assurance Division
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street NW
Atlanta, GA 30303
castillo.jairo@epa.gov

F. Onsite (and Adjacent Areas) Soil and Groundwater:

1. **Onsite Soil and Groundwater Characterization Sampling Plan:** Not later than ninety (90) days after the effective date of this Interim Consent Order, 3M shall submit a PFAS characterization sampling plan for the work required by Paragraph F.2 and Paragraph F.3 for the PFAS reasonably expected to be present in soil and groundwater that are identified in Attachment 1 and 2, and for the PFAS identified in Attachment 1A or later identified present at the Facility for which a reference standard or laboratory analytical method has been developed. The characterization plan shall identify the individual PFAS that are the subject of the sampling plan and the practical quantitation limit for those PFAS in soil. If the Department determines through its review of the submitted study plan that the plan is not sufficient, the Department shall notify 3M in writing of the basis(es) of its determination, and 3M shall modify the plan to address the Department's comments.

2. **Avenue A Ditch:** Not later than three hundred and sixty-five (365) days after the effective date of this Interim Consent Order, 3M shall complete and submit a report on its investigation of the groundwater discharge to the Avenue A ditch to determine its PFAS contribution, if any, to Outfall DSN006. The investigation shall include a sufficient number of samples of soil and groundwater as appropriate to identify the source and extent of any releases of PFAS to the Avenue A Ditch, as determined in accordance with the "Alabama Environmental Investigation and Remediation Guidance (AEIRG)," Version 4.0, dated February 2017. The number and location of soil and groundwater samples will be determined in consultation with the Department and described in the PFAS characterization sampling plan required by Paragraph F.1. Not later than ninety (90) days after the Department's acceptance of the groundwater investigation report, 3M shall submit an evaluation of additional PFAS reduction or groundwater capture alternatives (e.g., evaluation of treatment using the Groundwater GAC system). In that

report, 3M shall identify a proposed technically and economically feasible alternative, if any, and the specific basis(es) for selecting that alternative. 3M shall include a schedule for implementing the selected alternative in its report. Upon the Department's acceptance of 3M's recommendation, 3M shall implement, if determined necessary, the additional PFAS reduction or groundwater capture alternative in accordance with the approved schedule.

3. **Facility and Adjacent Areas Investigation:**

a. Not later than six hundred and thirty (630) days after the effective date of this Interim Consent Order, 3M shall perform an investigation, and submit a written report, of the PFAS present in soil and groundwater underlying the Facility and any adjacent offsite areas. The investigation shall include a sufficient number of appropriately located samples of soil and groundwater to identify the source and extent of any release of PFAS from the Facility to adjacent offsite areas. The number and location of soil and groundwater samples will be determined in consultation with the Department and described in the PFAS characterization sampling plan required by Paragraph F.1.

b. Not later than ninety (90) days after the date of the Department approval of the written report for the Facility and Adjacent Areas investigation, 3M shall submit an updated remediation plan that is developed in accordance with the "Alabama Environmental Investigation and Remediation Guidance (AEIRG)," Version 4.0, dated February 2017, and subsequently adopted updates, and, upon its approval, 3M shall implement the remedies, as directed by the Department, to mitigate the source(s), and migration, of PFAS in groundwater and soils. Such actions may include source controls measures including, but not limited to, removal and legal treatment, storage, or disposal of visually identifiable waste materials: removal and legal treatment, storage, or disposal of contaminated soils; permanent encapsulation of waste materials and/or contaminated soils with an appropriate cover system designed to prevent the infiltration of stormwater and reduce further migration of pollutants to waters of the State; groundwater containment, remediation and treatment measures; institutional and engineering controls; or other appropriate measures which are determined to be technically feasible as approved by the Department. 3M shall use the data collected during its investigation of the

Facility and adjacent areas to support a site-specific risk assessment. 3M's risk assessment shall be designed for the purpose of establishing risk-based target levels ("RBTL") for the PFAS that have been identified at the Facility and adjacent areas, and shall be designed in accordance with the Alabama Risk-Based Corrective Action ("ARBCA") Guidance Manual. 3M should utilize the data developed or provided in accordance with Paragraph J.3, or other publicly-available information, to establish RBTLs required by this paragraph. To the extent data does not exist, 3M agrees to work in consultation with the Department to prioritize, develop and implement studies necessary to develop an RBTL.

c. The groundwater migration controls and treatment remediation activities required by the NPDES Remedial Action Plan and described in Paragraph 33 of this Interim Consent Order for the FSIA will be completed pursuant to the terms of this Interim Consent Order. 3M will install these, and any additional groundwater migration controls and treatment pursuant to the updated remedial plan requirements and schedule required by this Paragraph. The NPDES Remedial Action Agreement will be closed-out by mutual agreement of the Parties upon the effective date of the Interim Consent Order.

G. Offsite Soil and Groundwater:

1. **Offsite Areas:** 3M shall identify all offsite areas where Facility wastes that are known or reasonably suspected to contain the PFAS identified in Attachment 2, or any other PFAS later identified present at the Facility for which a reference standard and laboratory analytical method has been developed, have been disposed of within Alabama. 3M shall provide a detailed report of its findings to the Department not later than forty-five (45) days after the effective date of this Interim Consent Order.

2. **Offsite Areas Investigations:** For all sites described in Paragraph 31 or identified in Paragraph G.1 of this Interim Consent Order, 3M shall perform, and submit a written report of, its investigation of the soils, surface water, and groundwater at each offsite area to identify the source and extent of any release or threatened release of PFAS. Each offsite investigation shall include a sufficient number of appropriately located samples of soil, surface water, and groundwater, as determined in consultation with the Department, to identify the source and

extent of any releases or threatened releases of PFAS from the respective offsite area. The investigation shall be performed in accordance with the AEIRG. The Department may require additional investigations to assess and investigate PFAS contamination at offsite areas. Not later than sixty (60) days after the effective date of this Interim Consent Order, 3M shall submit a revised schedule with dates to (1) perform an investigation of the soil, surface water and groundwater at each offsite area to identify the source and extent of any releases or threatened releases of PFAS as contained in previously submitted preliminary work plans for off-site locations, and (2) submit a written report to summarize the findings at each site.

3. **Offsite Areas Remediation Plan:** Not later than one hundred and twenty (120) days after the date of Department approval of the written investigation report for an offsite area, 3M shall submit a remediation plan to the Department developed in accordance with the AEIRG, and, upon its approval, 3M shall implement the remedy, as directed by the Department, to mitigate the sources of PFAS in groundwater, and in soils that could be expected to lead to the release of PFAS to groundwater or surface water. Such actions may include source controls measures including, but not limited to: removal and legal treatment, storage, or disposal of visually identifiable waste materials; removal and legal treatment, storage, or disposal of contaminated soils; permanent encapsulation of waste materials and/or contaminated soils with an appropriate cover system designed to prevent the infiltration of stormwater and reduce further migration of pollutants to waters of the State; institutional or engineering controls; or other appropriate measures which are determined to be technically feasible as approved by the Department. 3M shall use the data collected during its investigation of a site to support a site-specific risk assessment. 3M's risk assessment shall be designed for the purpose of establishing RBTLs for the PFAS that have been identified at the site, and shall be designed in accordance with the ARBCA Guidance Manual. 3M should utilize the data developed or provided in accordance with Paragraph J.3, or other publicly-available information, to establish RBTLs required by this paragraph. To the extent data does not exist, 3M agrees to work in consultation with the Department to prioritize, develop and implement studies necessary to develop an RBTL.

4. **Inventory of Current and Historical Alabama-Based Investigations:** Not later than one hundred and twenty (120) days after the effective date of this Interim Consent Order, 3M shall submit a comprehensive list of all current or historical 3M investigations of PFAS in the environment within the State of Alabama with a summary of the scope and results for each investigation. 3M shall submit additional details regarding such investigation within thirty (30) days of the Department's request.

H. Drinking Water:

1. **Private Drinking Water Wells:** Not later than thirty (30) days after the effective date of this Interim Consent Order, 3M shall submit to the Department for acceptance a plan for identifying all reasonably ascertainable private drinking water wells that may be impacted by PFAS from the Facility or from offsite locations identified through this Interim Consent Order. Upon identification of private drinking water wells that are potentially impacted by PFAS, 3M shall perform testing to determine if the well exceeds EPA or ADEM PFAS drinking water health advisory(ies) levels, and shall offer to provide either the connection of the private well owner to a public water supply or provide a suitable alternate drinking water supply, as required by the Department, in consultation with EPA.

2. **Notification to Public Drinking Water Systems:** Should a spill or other unanticipated event at or from the Facility cause PFAS to pass through the WWTP, bypass any portion of the WWTP, or upset the WWTP, 3M shall notify the Department and West Morgan East Lawrence Water Authority, City of Florence Utilities Water Department, Colbert County Rural Water System, Constellium Muscle Shoals, LLC, Muscle Shoals Utilities Board, Sheffield Utilities Department, and the Cherokee Water and Gas Department of the event. Notification for the purposes of this Paragraph shall be notification to the public drinking water systems and the Department within one (1) hour of knowledge of the condition. The terms "bypass" and "upset" should have the meaning ascribed to those terms in ADEM Admin. Code r. 335-6-6-.02(g) and (ccc), respectively.

I. Laboratory Analytical Methods and Reference Standards:

1. **Development of Laboratory Analytical Methods and Reference Standards:** On March 31 of each calendar year, 3M shall submit a report to the Department that identifies the laboratory analytical methods, method detection limits, and reference standards for the PFAS identified in Attachments 1 and 2. In its report, 3M also shall identify the laboratory analytical methods, method detection limits, and reference standards that have been developed for the PFAS listed in Attachment 1A and for any PFAS later identified at the Facility. 3M agrees to work in consultation with the Department and EPA to develop reference standards and laboratory analytical methods for the PFAS in Attachments 1, 1A, and 2, and any PFAS later identified at the Facility in the following media: air, wastewater, surface water, drinking water, fish tissue, sediments, soils and groundwater, provided that the PFAS are reasonably expected to be found in those media, and as reasonably required consistent with this Interim Consent Order.

2. **Non-Targeted Sample Collection and Analysis:** For the purpose of aiding ADEM-directed remedial investigations, not later than one hundred and eighty (180) days after the effective date of this Interim Consent Order, 3M shall submit to the Department a plan to conduct a study to identify and report the analytical results of non-targeted PFAS samples from representative air emission points, process water outfalls, stormwater outfalls, soils, and groundwater at the Facility to enable identification of unexpected or previously unknown PFAS compounds related to Facility operations and discharges. The collection and analysis of these samples shall be coordinated with ADEM and EPA to enable the collection and sharing of split-samples for analysis by each of the Parties.

J. Study Programs:

1. **Instream PFAS Characterization Study:** 3M shall conduct an instream PFAS characterization study of surface water, sediments, and fish tissue for the PFAS in Attachments 1, 1A, and 2, and any other PFAS later identified associated with the Facility provided that a reference standard and laboratory analytical method has been developed for the PFAS in those matrices (i.e., surface water, sediments, and fish tissue). 3M shall submit a study plan to the

Department for review, not later than ninety (90) days after the effective date of this Interim Consent Order. The plan should include a proposed schedule for completion of the studies and submittal of the results to the Department. If the Department determines through its review of the submitted study plan that the plan is not sufficient, the Department shall notify 3M in writing of the basis(es) of its determination, and 3M shall modify the plan to address the Department's comments. 3M shall submit modifications to the plan, if required, so that they are received by the Department no later than thirty (30) days after receipt of the Department's comments, or an alternate timeframe as approved by the Department. 3M shall implement the study plan not later than thirty (30) days after the Department's acceptance of the study plan.

2. **Toxicity Studies:** For the purpose of aiding ADEM-directed remedial investigations, not later than one hundred and eighty (180) days after the effective date of this Interim Consent Order, 3M shall submit to the Department a plan to conduct toxicity testing of the PFAS listed in Attachment 4 as outlined therein. 3M shall develop the study plan in consultation with EPA's Office of Research and Development (ORD). For the PFAS identified in Attachment 4, and as outlined therein, the study plan shall include proposals for conducting toxicity studies, conducted under the direction of appropriately qualified personnel, designed to aid ADEM and EPA in hazard identification, dose response assessment, and the subsequent development of screening levels, including the development of chemical specific parameters for the evaluation of carcinogenic and non-carcinogenic exposure and risk. If the Department, in consultation with EPA, reasonably determines through its review of the submitted study plan that the plan is not sufficient, the Department shall notify 3M in writing of the basis(es) of its determination, and 3M shall modify the plan to address the Department's comments. 3M shall submit modifications to the plan, if required, so that they are received by the Department no later than thirty (30) days after receipt of the Department's comments, or an alternate timeframe as approved by the Department. 3M shall submit the results of the implementation of the study plan within thirty (30) days of completion of each action.

3. **Environmental Studies:** For the purpose of aiding ADEM-directed remedial investigations, not later than one hundred and eighty (180) days after the effective date of this

Interim Consent Order, 3M shall submit to the Department a report which provides existing chemical specific parameters for PFAS listed in Attachments 1, 1A and 2 that would be used to evaluate the fate and transport of PFAS in the environment utilizing EPA RBTL protocols and/or calculations outlined in Appendix L and Appendix J of ARBCA for which such information does not currently exist in the published literature.

K. Air Characterization:

1. **Air Monitoring of 340/470/471/473 Process Emissions:** Not later than ninety (90) days after the effective date of this Interim Consent Order, 3M shall provide to the Department its test protocols, standard operating procedures, and performance data for the Fourier-transform infrared air emissions monitors located before and after the carbon adsorbers installed to treat air emissions from the 340 reactor system and the 470/471 reactor systems.

2. **Air Emissions Control Program:**

i. **Air Emissions Plan:** Not later than ninety (90) days after the effective date of this Interim Consent Order, 3M shall submit to the Department a plan and schedule for characterizing point source air emissions of PFAS from those processes in PFAS-service at the Facility that are in operation as of the effective date of this Interim Consent Order and that are projected to be in operation at the Facility on and after one year from the effective date of this Interim Consent Order. To the extent possible, the plan should describe 3M's approach to identifying the: specific processes in PFAS service subject to this study and related PFAS emission point sources, the principal PFAS emitted from each point source, and the testing or other analyses to estimate PFAS emissions from each point source to inform an air pollution collection and control technology feasibility study. If the Department determines through its review of the submitted emissions plan that it is not sufficient, the Department shall notify 3M in writing of the basis(es) of its determination, and 3M shall modify the plan to address the Department's comments. 3M shall submit modifications to the plan, if required, so that they are received by the Department not later than sixty (60) days after receipt of the Department's comments.

ii. **Air Emissions Study:** 3M shall conduct an air emissions study for those processes in PFAS-service identified in the emissions plan. The results of the emissions study shall include: PFAS emissions factors for each point source or group of point sources subject to the study, and estimated PFAS emissions rates using these emissions factors in conjunction with actual operations data. If the Department determines through its review of the submitted emissions study that it is not sufficient, the Department shall notify 3M in writing of the basis(es) of its determination, and 3M shall modify the study to address the Department's comments. 3M shall submit modifications to the study, if required, so that they are received by the Department not later than sixty (60) days after receipt of the Department's comments. 3M shall complete the emissions study not later than two hundred and seventy days (270) days after the Department's review and date of acceptance of the study plan.

iii. **Air Pollution Collection and Control Technology Feasibility Study:** 3M shall conduct a feasibility study for those processes in PFAS-service addressed in the emissions study to establish the best available control technology equivalent to reduce air emissions of PFAS from the Facility. 3M shall evaluate the feasibility of thermal oxidation, granular activated carbon, scrubbing technologies with packed filter beds, and other relevant feasible control technology for PFAS air emission control. As part of its feasibility study for the collection and control of PFAS emissions, 3M will evaluate the technical feasibility, economic feasibility (including cost-effectiveness), energy consumption, safety considerations, and the potential for media shifting of pollutants. 3M shall also include in the feasibility study how PFAS emissions performance may be demonstrated and monitored. 3M shall submit the results of the feasibility study with the best available control technology equivalency analyses to the Department not later than one hundred and eighty (180) days after the date of receipt of the Department's acceptance of the 3M emissions study. If the Department determines through its review of the submitted study that it is not sufficient or if the Department determines it does not concur with the analyses of best available control technology equivalency, the Department shall notify 3M in writing of the basis(es) of its determination(s), and 3M shall address the Department's comments. 3M shall

submit modifications to the study, if required, so that they are received by the Department no later than sixty (60) days after receipt of the Department's comments.

iv. **Air Pollution Control Technologies Pilot Study:** If 3M determines the conduct of a pilot study is necessary, 3M shall complete a pilot study of any one or more of the technologies identified as feasible in the Department-accepted feasibility study not later than two hundred and forty (240) days after the date of receipt of the Department's acceptance of the 3M feasibility study. 3M shall include in the study how PFAS emissions performance will be demonstrated and monitored, if different than that in the feasibility study. If the Department determines through its review of the submitted pilot study results, including a proposed schedule of implementation and a proposed collection/control performance level for each process in PFAS service, that it is not sufficient, the Department shall notify 3M in writing of the basis(es) of its determination, and 3M shall modify the proposed schedule of implementation to address the Department's comments. 3M shall submit modifications to the proposed schedule of implementation, if required, so that they are received by the Department not later than sixty (60) days after receipt of the Department's comments.

v. **Installation of Air Pollution Collection and Control Technology(ies):** 3M shall design and install the selected technology(ies) within three (3) years of the Department's acceptance of the air pollution collection and control technology feasibility study. Not later than ninety (90) days after initial startup of each of the installed technology(ies), 3M shall conduct onsite testing to determine PFAS emissions performance within of each of the installed technology(ies). Within sixty (60) days after completion of each onsite test for each installed technology(ies), 3M shall submit a test report that includes the proposed best available control technology equivalent emissions limit(s) determined by the testing and, if necessary, associated parametric operating limits for each installed technology(ies). If the Department determines through its review of the submitted test report(s) that it is not sufficient or if the Department determines it does not concur with the proposed limit(s), the Department shall notify 3M in writing of the basis(es) of its determination(s), and 3M shall address the Department's comments. 3M shall submit modifications to the test report(s), if required, so that they are

received by the Department no later than sixty (60) days after receipt of the Department's comments. 3M agrees to operate the air collection and abatement treatment technology(ies) at the Facility that maintains PFAS air emissions to achieve the emissions limitations, as agreed to by the Department.

L. Incorporation of Requirements into Permits: 3M shall not object to the incorporation of any requirement of this Interim Consent Order into any applicable permit issued by the Department.

M. Reporting Requirements:

1. Reports, Notifications, and Submissions to the Department:

a. Unless otherwise specifically allowed for in writing by the Department or as specified in this Interim Consent Order, an electronic copy, in a format acceptable to the Department, of all reports, studies, monitoring results, notifications, or other submissions that are required pursuant to this Interim Consent Order shall be electronically submitted to:

3Mademconsentorder@adem.alabama.gov

Each submittal should identify the document submitted and the applicable Paragraph of this Interim Consent Order which requires the submission.

b. Unless otherwise specified in this Interim Consent Order, whenever notifications are required of the Department by this Interim Consent Order, they shall be made in writing, sent electronically by email by the Department to 3M Company as follows:

3Mademconsentorder@mmm.com

Any Party may, by written notice to the other Parties, change its designated notice recipient or notice address provided above. Notices submitted pursuant to this Section shall be deemed submitted upon mailing, or emailing unless otherwise provided in this Consent Decree or by mutual agreement of the Parties in writing.

2. Submittal Deadlines: The submittals transmitted to the Department shall be electronically submitted as indicated in Paragraph M.1. not later than the deadlines provided in this Interim Consent Order. 3. Periodic Progress Reporting: 3M shall prepare progress reports

to the Department describing 3M's progress towards achieving compliance with the Interim Consent Order – Compliance Plan set forth in this Interim Consent Order. Beginning with the progress report due January 31, 2021, 3M will submit the progress reports on January 31 and July 31 of each calendar year until the "Certification" required by Paragraph N of the Interim Consent Order – Compliance Plan has been submitted. Each progress report shall include a summary report listing all documents electronically submitted to the Department within the preceding calendar six-month period pursuant to Paragraphs E and M.1. Each progress report shall include a trend graph of process wastewater and stormwater outfall data collected pursuant to the specific provision(s) of this Interim Consent Order. The report should also include the data, in an Excel format or other spreadsheet format approved by the Department, utilized to generate the graphs required by this section.

4. Non-Compliance Reporting: Reports of noncompliance with any requirement contained in any compliance schedule of this Interim Consent Order shall be submitted to the Department not later than fourteen (14) calendar days following the scheduled date of compliance. A report of noncompliance shall state the cause(s) of noncompliance, the corrective action taken or to be taken, including the estimated timeframe to complete the corrective action, and shall describe 3M's ability to comply with any remaining requirements of this Interim Consent Order.

5. Certification: All submissions required by this Interim Consent Order and submitted to the Department shall be electronically signed (or, if allowed by the Department, signed by hand) by a "responsible official" of the permittee as defined in ADEM Admin. Code r. 335-6-6-.09, or a "duly authorized representative" of such official as defined in ADEM Admin. Code r. 335-6-6-.09, and allowed by ADEM Admin. Code r. 335-6-6, and shall bear the following certification:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant

penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

N. 3M shall comply with the terms, conditions, and limitations of the Interim Consent Order, upon its effective date of this Interim Consent Order. Not later than one hundred and eighty (180) days after completion of the latest compliance date required by this Interim Consent Order, 3M shall submit a certification to the Department, signed by a professional engineer licensed to practice in the State of Alabama, indicating that 3M is in compliance with all requirements of this Interim Consent Order. This certification shall be signed by both the certifying professional engineer and the appropriate responsible official of 3M, and shall include the certification required by Paragraph M.5.

O. ADEM Funding Mechanism: 3M shall provide reimbursement to the Department for ADEM's reasonable and necessary costs of overseeing the response actions and other activities to be undertaken by 3M pursuant to this Interim Consent Order as provided herein.

1. Not later than thirty (30) days after the completion of each fiscal year quarter, ADEM shall prepare and submit to 3M an invoice for the reasonable and necessary oversight costs related to the response actions and other activities to be undertaken by 3M pursuant to this Interim Consent Order incurred by ADEM during the preceding quarter, for reimbursement.

2. 3M shall reimburse the Department for all reasonable costs of ADEM's oversight activities related to the response actions and other activities to be undertaken by 3M pursuant to this Interim Consent Order. Any payment by 3M pursuant to this Section shall not constitute or be evidence of any admission by 3M of any liability to ADEM or to any other person or entity with respect to the response actions and other activities to be undertaken by 3M pursuant to this Interim Consent Order.

3. Reimbursement shall be made in a timely manner. Checks or payments made by other means shall be made payable to "The Alabama Department of Environmental Management," shall specifically reference the "3M Interim Consent Order", and shall be forwarded to:

Alabama Department of Environmental Management
Chief, Fiscal Branch
P.O. Box 301463
Montgomery, Alabama 36130-1463

P. Stipulated Penalties: After the effective date of this Interim Consent Order, 3M shall pay stipulated penalties for each day it fails to meet any of the milestone dates or satisfy any of the requirements as set forth in the schedules set forth below in this Paragraph, unless excused as *Force Majeure.* The stipulated civil penalties for failure to meet the requirements of the Interim Consent Order-Compliance Plan, except for *Force Majeure* acts as hereinafter defined, shall be as follows:

1. **Reporting Requirements:** The following stipulated penalties shall accrue per violation per day for each day 3M fails to timely submit a report or study as required by the Interim Consent Order:

Period of Noncompliance	**Penalty per Day per Violation**
1st to 30th day:	$ 375
31st to 60th day:	$ 600
After 60 days:	$ 1200

The above stipulated penalty schedule shall apply to the following paragraphs of the Interim Consent Order – Compliance Plan: Paragraphs A.1 (NPDES Permit Application); A.4 (Notification of Discharge); E.1 (Submission of Monitoring Results); E.2 (Periodic Progress Reporting); G.1 (Offsite Areas); G.2 (Offsite Areas Investigation); G.4 (Inventory of Current and Historical Alabama-Based Investigations); H.2 (Notification to Public Drinking Water Systems); I.1 (Development of Analytical Test Methods and Laboratory Standards); K.1 (Air Monitoring of 340/470/471/473 Process Emissions); and M (Certification).

2. **Study, Monitoring, and Audit Requirements:** The following stipulated penalties shall accrue per violation per day for each day of violation of the study, monitoring and audit requirements:

Period of Noncompliance	**Penalty per Day per Violation**
1st to 30th day:	$ 750
31st to 60th day:	$ 1200
After 60 days:	$ 2400

The above stipulated penalty schedule shall apply to the following paragraphs of the Interim Consent Order – Compliance Plan: Paragraphs A.2 (DMR Audit); C.3.b (Carbon Bed Replacement Study); D.1 (Outfall Monitoring); D.2 (WWTP Influent Monitoring); D.3 (Cooling Water Intake Monitoring); H.1 (Private Drinking Water Wells); I.2 (Non-Targeted Sample Collection and Analysis); and J.1 (Instream PFAS Characterization Study); J.2 (Toxicity Studies); and J.3 (Environmental Studies).

3. **Program Implementation:** The following stipulated penalties shall accrue per violation per day for each violation of the program requirements of the Interim Consent Order:

Period of Noncompliance	**Penalty per Day per Violation**
1st to 30th day:	$ 1000
31st to 60th day:	$ 2000
After 60 days:	$ 3500

The above stipulated penalty schedule shall apply to the following paragraphs of the Interim Consent Order – Compliance Plan: Paragraphs A.3 (Stormwater Best Management Practices); B.1 (Granular Activated Carbon Treatment System); B.2 (Fluoroelastomer Pretreatment Granular Activated Carbon System); C.1 (Operation and Maintenance of GAC Systems); and C.2 (Operation and Maintenance of the WWTP); D.4 (Wastewater Characterization Sampling Plan); F.1 Onsite Soil and Groundwater Characterization Sampling Plan; F.2 (Avenue A Ditch); F.3 (Facility (and Adjacent Areas) Investigation); and G.3 (Offsite Areas Remediation Plan).

4. Performance Standards: The following stipulated penalties shall accrue per violation per day for each violation of the program requirements of the Interim Consent Order:

Period of Noncompliance	**Penalty per Day per Violation**
1st to 30th day:	$ 1500
31st to 60th day:	$ 2500
After 60 days:	$ 3500

The above stipulated penalty schedule shall apply to the following paragraphs of the Interim Consent Order – Compliance Plan: Paragraphs C.3.a (Carbon bed performance standards); and K.2 (Air Emissions limitations).

5. Wastewater Treatment Controls: The following stipulated penalties shall accrue per violation per day for each violation of the program requirements of the Interim Consent Order:

Period of Noncompliance	**Penalty per Day per Violation**
1st to 30th day:	$ 3,000
31st to 60th day:	$ 5,000
After 60 days:	$ 8,000

The above stipulated penalty schedule shall apply to the following paragraphs of the Interim Consent Order – Compliance Plan: B.1 (Granular Activated Carbon Treatment System); B.2 (Fluoroelastomer Pretreatment Granular Activated Carbon System); Paragraphs B.3 (Cooling Water Recycle System); B.4 (Wastewater Minimization Plan); B.5 (Evaluation of Wastewater Pollution Control Technologies); B.6 (Wastewater Treatment Plant Equipment Repair and Replacement).

6. Payment of stipulated penalties are due for violations of milestone dates under this Interim Consent Order, as set forth in the schedules above, not later than the 28th day of the month following the month a milestone date was not achieved. Notification to 3M by the Department of the assessment of any stipulated penalty is not required. All penalties due

pursuant to this Interim Consent Order shall be made payable to the Alabama Department of Environmental Management by certified or cashier's check and shall be remitted to:

Office of General Counsel
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, Alabama 36130-1463

Or, in the alternative, payment of the stipulated penalties assessed herein shall be made in the form of a wire transfer (or "EFT") payable to the Alabama Department of Environmental Management pursuant to the wire instructions to be provided to 3M by the Department, or other mutually agreed upon form of payment.

Q. General Provisions:

1. The Department reserves the right to issue additional orders or file suit against 3M in the Circuit Court of Montgomery County or other Court of competent jurisdiction to enforce compliance with this Interim Consent Order.

2. This Interim Consent Order shall apply to and be binding upon both Parties, their directors, officers, and all persons or entities acting under or for them. Each signatory to this Interim Consent Order certifies that he or she is fully authorized by the Party he or she represents to enter into the terms and conditions of this Interim Consent Order, to execute the Interim Consent Order on behalf of the Party represented, and to legally bind such Party.

3. 3M neither admits nor denies the Department's contentions but consents to abide by the terms of the Interim Consent Order. Nothing in this Interim Consent Order releases 3M from any liability it may have to the Department, including EPA, resulting from its actions or omissions, including the alleged violations identified in this Interim Consent Order, and including any alleged failure to comply with any provision of this Interim Consent Order. This Interim Consent Order shall not be construed to be a determination on the merits of any of the factual allegations or legal claims advanced by any party to this action.

4. Unless otherwise expressly provided for in this Interim Consent Order, the Parties intend to exercise alternative dispute resolution procedures of this Paragraph to resolve disputes arising under or with respect to this Interim Consent Order.

a. Informal Dispute Resolution: If 3M objects to any Department action taken pursuant to this Interim Consent Order, it shall send a written notice of dispute to the Department describing the objection(s) within sixty (60) days after such action. 3M and the Department shall have sixty (60) days after receipt of 3M's notice of dispute to resolve the dispute through informal negotiations. The period of informal negotiations may be extended by agreement of 3M and the Department. Any agreement reached by 3M and the Department pursuant to this Section shall be in writing and shall, upon signature of 3M and the Department, be incorporated by reference into and become enforceable part of this Interim Consent Order.

b. Mediation: If 3M and the Department are unable to reach agreement through informal negotiations then 3M and the Department may by mutual agreement seek to resolve the dispute through mediation. Should 3M and the Department agree to seek a mediated resolution to the dispute the parties agree to share equally in the costs of the mediation. The mediation shall be administered by an independent third party mediator selected by mutual consent of 3M and the Department. Nothing in this paragraph is intended to preclude the Department from bringing an action to compel compliance with the terms and conditions of the Interim Consent Order as set forth in Paragraph P.6

5. For purposes of this Interim Consent Order only, the Department may properly bring an action to compel compliance with the terms and conditions contained herein in the Circuit Court of Montgomery County or any other Court of competent jurisdiction. In any action brought by the Department to compel compliance with the terms of this Agreement, 3M shall be limited to the defenses of *Force Majeure*, compliance with this Agreement, and technical and physical impossibility. A *Force Majeure* is defined as any event arising from causes that are not reasonably foreseeable and are beyond the reasonable control of 3M, including its contractors and consultants, which could not be overcome by due diligence (i.e., causes which could have been overcome or avoided by the exercise of due diligence will not be considered to have been beyond the reasonable control of 3M) and which delays or prevents performance by a date required by the Interim Consent Order. The term *Force Majeure* may include delays to the extent that any such delay or failure to meet a timeframe is caused by the COVID-19 public health

crisis, even though COVID-19 is already under way, provided that 3M otherwise meets the definition of *Force Majeure* under this Interim Consent Order.

6. Events such as unanticipated or increased costs of performance, changed economic circumstances, normal precipitation events, or failure to obtain federal, state, or local permits shall not constitute *Force Majeure*. Any request for a modification of a deadline shall be accompanied by the reasons (including documentation) for each extension and the proposed extension time. 3M shall submit this information so that it is received by the Department a minimum of ten (10) business days prior to the original anticipated completion date. If the Department, after review of the extension request, finds the work was delayed because of conditions beyond the control and without the fault of 3M, the Department may extend the time as justified by the circumstances. The Department may also grant any other additional time extension as justified by the circumstances, but it is not obligated to do so. The Department's agreement to extend a compliance date or obligation will be memorialized in writing. An extension of one compliance date based on a particular event shall not automatically extend other compliance dates. 3M shall make an individual showing of proof regarding the cause of each delayed incremental step or other requirement for which an extension is sought. 3M may petition for the extension of more than one compliance date in a single request.

7. Nothing in this Interim Consent Order shall be construed as extending any reporting requirements and deadlines as set forth in any permits issued by the Department to 3M.

8. Nothing contained in this Interim Consent Order shall be construed to prevent or limit the Department's rights to obtain penalties or further or additional injunctive relief under the AEMA, AWPCA, AAPCA, AHWMMA, ASDWA or other local, state or federal statutes or regulations.

9. The "effective date" of this Interim Consent Order is the date that the Interim Consent Order is signed by the Director of ADEM or his designee. This Interim Consent Order shall not be appealable, and 3M does hereby waive any hearing on the terms and conditions of same.

10. This Interim Consent Order shall not affect 3M's obligation to comply with any federal, state, or local laws or regulations.

11. Should any provision of this Interim Consent Order be declared by a court of competent jurisdiction or the Environmental Management Commission to be inconsistent with federal or state law and therefore unenforceable, the remaining provisions hereof shall remain in full force and effect.

12. Headings in this Interim Consent Order are provided for convenience only and shall not affect the substance of any provision.

13. Nothing in this agreement is intended to preclude the parties from mutually agreeing to modify the terms and conditions of this Interim Consent Order. Any modification of this Interim Consent Order shall be agreed to in writing and signed by both Parties.

14. Except as otherwise set forth herein, this Interim Consent Order is not and shall not be interpreted to be a permit or modification of an existing permit under federal, state, or local law, and shall not be construed to waive or relieve 3M of its obligations to comply in the future with any permit or order.

Executed in duplicate, with each part being an original.

3M COMPANY, INC.

By: [signature]
Its: Senior Vice President
Date: July 23, 2020

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

EXECUTED AND ISSUED:

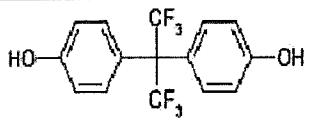
By: [signature]
Its: Director
Date: July 24, 2020

Attachment 1: Decatur On-Site PFAS[1]

			Available Analytical Method			
Short Name or Acronym	**CASN**	**Chemical Name or Structure**	**Air**	**Water**	**Soil**	**Sediment**
TFA	76-05-1	Trifluoroacetic acid	X	X[2]		
PFPA	378-76-7	Perfluoropropionic acid	X	X[2]		
PFBA (linear)	375-22-4	Perfluorobutyric acid CF3CF2CF2COOH	X[3]	X[2,3]		
PFBS, C4 Sulfonate	375-73-5	Nonafluorobutane-1-sulfonic acid		X	X	X
PBSF/DMAPA	68555-77-1	N-[3-(Dimethylamino)propyl]-1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulfonamide		X		
PBSF/DMAPA/AA	212335-64-3 OR 172616-04-5	2-Propenoic acid, reaction products with N-[3-(dimethylamino)propyl]-1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonamide OR N-[3-(Dimethylamino)propyl]-N-(1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulfonyl)-beta-alanine		X		
PFPeA	2706-90-3	Perfluoropentanoic Acid		X[2]	X[2]	X[2]
PBSK	29420-49-3	Potassium nonafluorobutane-1-sulfonate		X[2]	X[2]	X[2]
FBSA, C4 amide	30334-69-1	1,1,2,2,3,3,4,4,4-Nonafluorobutane-1-sulfonamide	X	X	X	X
	131003-86-6	1,1,2,2,3,3,4,4,4-Nonafluorobutane-1-sulfonamide Ammonium salt (FBSA -NH4)	X[2]	X[2]	X[2]	X[2]
MeFBSA, C4 Methyl	68298-12-4	1,1,2,2,3,3,4,4,4-Nonafluoro-N-methylbutane-1-		X	X	X

[1] The analytes listed in Attachment 1 include PFAS raw materials, byproducts and products that are either currently used or manufactured on site or have been used or manufactured in recent history (approximately after the year 2000). These analytes may potentially be available in onsite media but would not be expected to be available in offsite media.

Attachment 1: Decatur On-Site PFAS

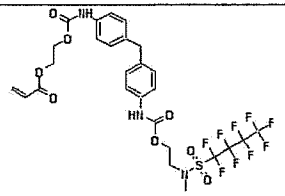
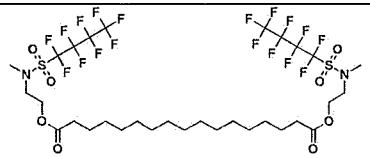
			Available Analytical Method			
Short Name or Acronym	**CASN**	**Chemical Name or Structure**	**Air**	**Water**	**Soil**	**Sediment**
Amide		Sulfonamide				
MeFBSE, C4 Methyl Alcohol	34454-97-2	1,1,2,2,3,3,4,4,4-Nonafluoro-N-(2-hydroxyethyl)-N-methylbutane-1-sulfonamide	X	X	X	X
FBSE, C4 Primary Alcohol	34454-99-4	1,1,2,2,3,3,4,4,4-Nonafluoro-N-(2-hydroxyethyl)-1-butanesulfonamide	X	X		
	484024-67-1	1,1,2,2,3,3,4,4,4-Nonafluoro-N-(2-hydroxyethyl)-1-butanesulfonamide AmmoniumSalt	X[2]	X[2]		
FBSEE, C4 diol	34455-00-0	1,1,2,2,3,3,4,4,4-Nonafluoro-N,N-bis(2-hydroxyethyl)butane-1-sulfonamide	X	X		
2333 TFPA	359-49-9,	CF3CFHCOOH 2,3,3,3-Tetrafluoropropionic acid		X[2]		
Propanoic acid, 2,2,3,3-tetrafluoro-	71592-16-0	HCF2CF2COOH Propanoic acid, 2,2,3,3-tetrafluoro		X[2]		
C4 Methyl Amide Phosphonium Curatives	332350-93-3	Phosphonium, triphenyl(phenylmethyl)-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1 butanesulfonamide (1:1)		X[1]		
bis-Phenol AF	1478-61-1		X	X		
DBI	129135-87-1	Bis(Nonafluorobutanesulfonyl)imide	X	X		
HFP, Hexafluoropropylene	116-15-4	1,1,2,3,3,3-Hexafluoro-1-propene	X	X		
ADONA	958445-44-8	3H-Perfluoro-3-[(3-methoxy-propoxy)propanoic acid], ammonium salt	X[2]	X[2]		

Attachment 1: Decatur On-Site PFAS

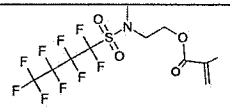
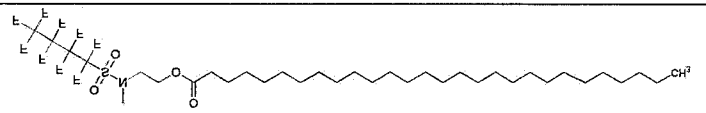
			Available Analytical Method			
Short Name or Acronym	**CASN**	**Chemical Name or Structure**	**Air**	**Water**	**Soil**	**Sediment**
PMVE	1187-93-5	Perfluormethylvinylether	X	X		
DIOFB	375-50-8	1,4-Diiodocotafluorobutane; Octafluoro-1,4-diiodobutane	X	X		
VDF	75-38-7	1,1-Difluoroethylene	X	X		
TFE	116-14-3	Tetrafluoroethylene	X	X		
HFPO-DA	13252-13-6	Hexafluoropropylene oxide dimer acid		X[2]		
PFBSi	34642-43-8	Nonafluorobutane-1-sulfinic acid		X[2]	X[2]	X[2]
MeFBSAA, C4 Methyl glycine Acid	159381-10-9	Perfluorobutyl-methyl sulfonamido acetic acid		X[2]		
FBSAA, C4 glycine Acid	347872-22-4	Perfluorobutyl sulfonamido acetic acid		X[2]		
FBSEE diacid	1268835-43-3	[(Nonafluorobutane-1-sulfonyl)-carboxymethylamino]acetic acid		X[2]		
PBSF	375-72-4	Perfluorobutanesulfonyl fluoride	X	X[1]		
PFSA monomer	88190-28-7	1,1,2,2,3,3,4,4-octafluoro-4-[(trifluoroethenyl)oxy]-1-butanesulfonyl fluoride	X	X[1]		

X[1] = Reacts in water to form another species that is measured by the analytical method.
X[2]= Anion is measured by the analytical method
X[3] = Current analytical method does not distinguish linear from branched isomer

Attachment 1A: Decatur On-Site PFAS Requiring Further Standard and Method Development

Short Name or Acronym	CASN	Chemical Name or Structure
bis-Phenol AF Curatives		Multiple curatives based on Bis-phenol AF
Oligomers		R2(CF2CH2)x-R1
Tetrafluoropropionic acid esters		CF3CFHCOO-R
C4 Methyl Amide Phosphonium Curatives	332350-90-0	Phosphonium, tributyl(2-methoxypropyl)-, salt with 1,1,2,2,3,3,4,4,4- nonafluoro-N-methyl-1-butanesulfonamide (1:1)
C4 protective treatment monomer	856220-62-7	
C18-Diester		
HFPO-TA	2641-34-1	Hexafluoropropylene oxide trimer acid
HFPO-TetA	27639-98-1	Hexafluoropropylene oxide tetramer acid
PFSA monomer pre-cursor	117516-16-2	2,3,3,3-tetrafluoro-2-[1,1,2,2,3,3,4,4-octafluoro-4-(fluorosulfonyl)butoxyl]propanoyl fluoride
Iso-PFBA (branched)	335-10-4	(CF3)2CFCOOH Propanoic acid, 2,3,3,3-tetrafluoro-2-(trifluoromethyl)-
C4 Hydride Sulfonate	70259-85-7 (K salt form)	Potassium 1,1,2,2,3,3,4,4-octafluorobutane-1-sulfonate

Attachment 1A: Decatur On-Site PFAS Requiring Further Standard and Method Development

MeFBSEA, C4 acrylate	67584-55-8	2-[Methyl(1,1,2,2,3,3,4,4,4-nonafluorobutane-1-sulfonyl)amino]ethyl prop-2-enoate
MeFBSEMA, C4 methyacrylate		
2-Fluoromalonic acid	473-87-0	HOOCCFHCOOH
[Fluorochemical ester PM-870		
PHSA-S1	38850-58-7	1-Propanaminium, N-(2-hydroxyethyl)-N,N-dimethyl-3-[(3 sulfopropyl)[(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexyl)sulfonyl]amino]-, inner salt
PHSA-OH1	2103241-09-2	1-Propanaminium, 2-hydroxy-*N*,*N*-dimethyl-3-sulfo-*N*-[3-[[(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexyl)sulfonyl]amino]propyl]-, inner salt
C8 Quaternary Ammonium Iodide or Chloride Salt	1652-63-7, 153810-83-4, 34561-26-7, 39340-48-2, 54298-25-8, 94809-83-3	3-(1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctylsulfonylamino)propyl-trimethyl-ammonium;methane

Attachment 2: Decatur On- and Off-Site PFAS[2]			Available Analytical Method			
Short Name or Acronym	**CASN**	**Chemical Name or Structure**	**Air**	**Water**	**Soil**	**Sediment**
PFBA (linear)	375-22-4	Perfluorobutyric acid CF3CF2CF2COOH	X[3]	X[2,3]		
PFBS, C4 Sulfonate	375-73-5	Nonafluorobutane-1-sulfonic acid		X	X	X
PFPeS	2706-91-4	Perfluoropentanesulfonate		X		
PFHxA	307-24-4	Perfluorohexanoic acid	X[2]	X[2]	X[2]	X[2]
PFHxS	355-46-4	Perfluorohexanesulfonate	X	X	X	X
PFHxSA	41997-13-1, 8169-3-16	1,1,2,2,3,3,4,4,5,5,6,6,6-Tridecafluorohexane-1-sulfonamide; perfluorohexanesulfonamide		X		
PFHpA	375-85-9	Perfluoroheptanoic acid		X[2]	X[2]	X[2]
PFHpS	375-92-8	Perfluoroheptanesulfonate		X		
PFOA	335-67-1	Perfluorooctanoic acid	X[2]	X[2]	X[2]	X[1]
PFOS	1763-23-1	Perfluorooctanesulfonate	X	X	X	X
PFOSA	754-91-6	Perfluorooctanesulfonamide	X	X	X	X
PFNA	375-95-1	Perfluorononanoic acid		X[2]	X[2]	X[2]
PFNS	68259-12-1	Perfluorononanesulfonate		X		
PFDA	335-76-2	Perfluorodecanoic acid		X[2]	X[2]	X[2]
PFDS	335-77-3	Perfluorodecanesulfonate		X		
PFUnA	2058-94-8	Perfluoroundecanoic acid		X[2]	X[2]	X[2]

[2] The analytes listed in Attachment 2 include PFAS byproducts and products that were historically manufactured (approximately prior to 2002) at the site but have since been phased out. These analytes may potentially be available in both onsite and offsite media.

Attachment 2: Decatur On- and Off-Site PFAS

Attachment 2: Decatur On- and Off-Site PFAS[2]			Available Analytical Method			
Short Name or Acronym	CASN	Chemical Name or Structure	Air	Water	Soil	Sediment
PFDoA	307-55-1	Perfluorododecanoic acid		X[2]	X[2]	X[2]
PFDoS	79780-39-5	Perfluorododecylsulfonate		X		
PFTrA	72629-94-8	Perfluorotridecanoic acid		X[2]		
PFTreA	376-06-7	Perfluorotetradecanoic acid		X[2]		
PFHxDa	67905-19-5	Perfluorohexadecanoic acid		X[2]		
PFODA	16517-11-6	Perfluorooctadecanoic acid		X[2]		
N-EtFOSAA	2991-50-6	N-ethyl perfluorooctanesulfonamidoacetic acid		X[2]		
N-MeFOSAA	2355-31-9	N-methyl perfluorooctanesulfonamidoacetic acid		X[2]		
EtFOSA	4151-50-2	N-ethyl perfluorooctanesulfonamide	X	X		
MeFOSA	31506-32-8	N-methyl perfluorooctanesulfonamide	X	X		
PECHS	335-24-0	Perfluoro-4-ethylcyclohexanesulfonate		X		
PBSA	68555-77-1	N-[3-(dimethylamino)propyl]-1,1,2,2,3,3,4,4-nonafluoro-butane-1-sulfonamide		X		
PBSA-C1 or C2	172616-04-5	3-((N-(3-(dimethylamino)propyl)-perfluorobutyl)sulfonamido)propanoic acid		X		
PBSA-DC	225460-13-7	3-((3-((N-(2-carboxyethyl)-perfluorobutyl)sulfonamido)propyl)-dimethylammonio)propanoate		X		

Attachment 2: Decatur On- and Off-Site PFAS

Attachment 2: Decatur On- and Off-Site PFAS[2]			Available Analytical Method			
Short Name or Acronym	CASN	Chemical Name or Structure	Air	Water	Soil	Sediment
PBSA-S1	2089108-94-9	1-Propanaminium, N-(2-hydroxyethyl)-N,N-dimethyl-3-[[(1,1,2,2,3,3,4,4,4-nonafluorobutyl) sulfonyl](3-sulfopropyl)amino]-, inner salt		X		
PHSA	50598-28-2	N-[3-(dimethylamino)propyl]-1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-hexane-1-sulfonamide		X		
PHSA-C1	141607-32-1	3-((N-(3-(dimethylamino)propyl)-perfluorohexyl)sulfonamido)propanoic acid		X		
PHSA-C2	81190-41-2	2-carboxyethyl-dimethyl-[3-(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexylsulfonylamino)propyl]ammonium		X		
PHSA-DC	756771-34-3	3-[3-[2-carboxylatoethyl(dimethyl)ammonio]propyl-(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexylsulfonyl)amino]propanoate		X		
PHSA-S3	38850-60-1	3-[3-(dimethylamino)propyl-(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexylsulfonyl)amino]propane-1-sulfonic acid		X		
PHSA-E1	736877-37-5	1-Propanaminium, N-(2-hydroxyethyl)-N,N-dimethyl-3-[[(1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluorohexyl)sulfonyl]amino]-, inner salt		X		
PFOSA-NO	178094-69-4 (K salt)	N-oxide of N-[3-(dimethylamin)propyl)-perfluorooctane-1-sulfonamide		X		
PFHxSF	423-50-7	Perfluorohexane sulfonyl fluoride	X	X[1]		

Attachment 2: Decatur On- and Off-Site PFAS

Attachment 2: Decatur On- and Off-Site PFAS[2]			Available Analytical Method			
Short Name or Acronym	CASN	Chemical Name or Structure	Air	Water	Soil	Sediment
POSF	307-35-7	Perfluorooctane sulfonyl fluoride	X	X[1]		

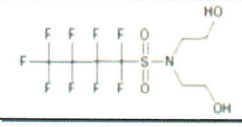
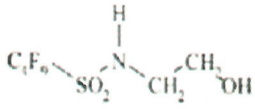
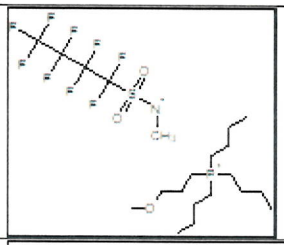
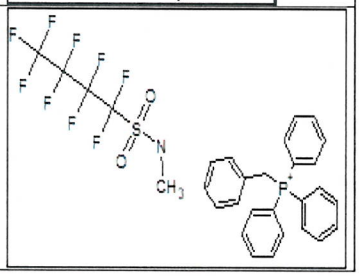
X[1] = Reacts in water to form another species that is measured by the analytical method.
X[2]= Anion is measured by the analytical method.

Attachment 3: NPDES Effluent Exceedances

Monitoring Period	Outfall	Parameter	Limit	Reported	Unit	Violation Type
April-June 2018	01CQ	Chloroform	0.120	0.208	lbs/day	Monthly Average
April-June 2019	01CQ	Chromium	1.203	10.7895	lbs/day	Monthly Average
April-June 2019	01CQ	Chromium	3.003	10.7895	lbs/day	Maximum Daily

Attachment 4: PFAS Toxicity Testing Requirements

1. Testing of the following PFAS:

Target Analyte	Acronym	CAS No.	Structure
Perfluorobutane sulfonamide	FBSA	30334-69-1	
Nonafluoro-N,N-bis(2hydroxyethyl)butane-1sulfonamide	FBSEE diol	34455-00-0	
Nonafluoro-N-(2hydroxyethyl)butane-1sulfonamide	FBSE	34454-99-4	
Phosphonium, tributyl(2-methoxypropyl)-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1-butanesulfonamide (1:1)	TBBP:MeFBSA	332350-90-0	
Phosphonium, triphenyl(phenylmethyl)-, salt with 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-1-butanesulfonamide (1:1)	TPBP:MeFBSA	332350-93-3	

2. Studies

The following studies shall be conducted in accordance with applicable Organization for Economic Co-operation and Development ("OECD") protocols as defined by EPA's Office of Pollution Prevention and Toxics ("OPPT") or other appropriate protocols as determined by the Department. The target analytes are the nominal substances to be tested in each required study. The study plan will specify the chemical form of the target analyte to be used in each study (e.g., FBSA ammonium salt versus acid form, and the forms of the curative salts). This is to ensure the form of the target analyte tested is stable and soluble in the test or dosing media. A detailed study plan and proposed schedule of work will be provided for the required studies identified below in a, b, and c. Nothing in the foregoing paragraph precludes 3M from recommending modifications to the OECD protocols identified below:

a. **Ecological Toxicity Studies:**
   i. Algal acute (72-hour growth) toxicity study (OECD 201 or equivalent);
   ii. Daphnid acute toxicity study (OECD 202 or equivalent);
   iii. Daphnid chronic (reproduction) toxicity study (OECD 211 or equivalent);
   iv. Fish acute toxicity study (OECD 203 or equivalent); and
   v. Sediment 28-day freshwater invertebrate toxicity test (OECD 218 or equivalent).

Results from the studies listed in section 2.a of this attachment, as well as from the information to be collected as a part of the instream PFAS characterization study identified in J.1 of this Interim Consent Order, will be considered in a weight-of-evidence-based approach to inform the need for further evaluation of chronic toxicity or bioaccumulation.

b. **Mutagen/Clastogen Toxicity Studies**

3M shall conduct the following studies:
   i. In Vitro Mammalian Cell Gene Mutation Tests Using the Thymidine Kinase Gene (OECD TG 490);
   ii. Bacterial Reverse Mutation Test (OECD TG 471);
   iii. In Vitro Mammalian Chromosomal Aberration Test (OECD TG 473);
   iv. Mammalian Erythrocyte Micronucleus Test (OECD TG 474); and

The inclusion of endpoints in developmental/reproductive studies under 2.c below, which are consistent with the evaluation of dominant lethality in rodents.

Results from the studies listed in section 2.b of this attachment, as well as from the repeat-dose non-cancer studies identified in 2.c of this attachment, will be considered in a weight-of evidence-based approach to inform the need for further evaluation of carcinogenic potential. Specifically, positive observations of genotoxicity, mutagenicity, or clastogenicity and/or indicators of altered cellular or tissue structure or function consistent with cancer (e.g., histological lesions or altered cell foci or populations), may warrant a comprehensive chronic duration in vivo cancer bioassay.

All in vitro cell-based studies shall be conducted with and without metabolic activation

c. Non-Cancer Toxicity Studies:

3M shall conduct the following studies:

1) Toxicokinetic screening and dose range-finding studies in rats and mice will be conducted to determine the best species for subsequent repeat-dose (e.g., sub-chronic) studies. The toxicokinetic and dose range-finding studies may be separate or combined. For toxicokinetic assessment, a modified in vivo protocol may be used in lieu of OECD 417.

2) A combined reproductive/developmental (OECD 422), and, a 90-day study (OECD TG 408) will be conducted in the most sensitive rodent species identified in part i. above. Based on preliminary 3M study evaluation(s) (e.g., dose-range finding study) of the PFAS listed in Table 1 of this attachment, 3M may propose an alternative approach to OECD 422; specifically, if warranted, a separate 28-day repeated exposure (OECD 407) and a one-generation reproductive toxicity (OECD 443) study may be conducted. To satisfy the necessity for evaluating dominant lethality under section 2b above, the reproductive/developmental study design shall also include mating of pre-treated male rodents with unexposed females, and measurement of endpoints and parameters associated with embryo- and fetal lethality.

Note: In addition to effects/endpoints already listed under OECD TGs 422 (or alternatively, OECD TGs 407 and 443) and 408, all in vivo animal studies conducted shall include evaluation of blood/serum biomarkers and cell populations/tissue(s) associated with thyroid toxicity and immunotoxicity. Although there is flexibility in the specific immune endpoints and parameters to be included in a given study protocol, 3M must ensure that study designs are positioned to provide sufficient qualitative and quantitative data to inform this health outcome domain, particularly as it pertains to functional immunity. Further, evaluation of potential thyroid and immunotoxicity should include biological samples obtained from both exposed adult animals and offspring exposed in utero.

Figure 1: Site Map