Life Cycle Assessment of PFAS Removal from Landfill Leachate at the Laboratory Scale

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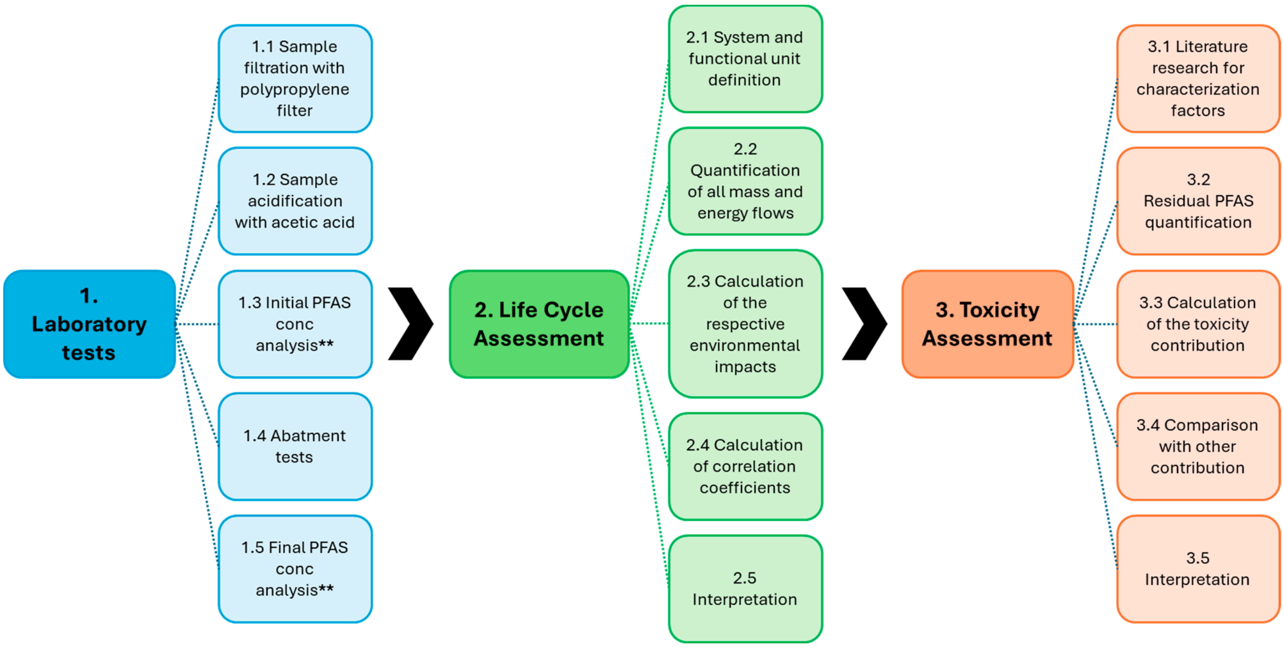
SUPPORTING MATERIALS AND INFORMATION

Scheme S1: Overall workflow representing the different steps for each phase of the study. An in-depth explanation of the PFAS analysis procedure is provided below.



**Extended PFAS analysis procedure description

The determination of PFAS concentration required the preparation of standard solutions at known and increasing concentrations to generate a calibration curve. These standard solutions were prepared from certified standards and undergo the same pre-treatments as the samples to be analysed. The standard solution is a mixture consisting of the following types of PFAS at known concentrations (100μg/ml):

- PFBS, Perfluorobutanesulfonic acid (CAS number 375-73-5) .
- PFHxS, Perfluorohexanesulfonic acid (CAS number 355-46-4) .
- PFOS, Perfluorooctanesulfonic acid (CAS number 1763-23-1) .

- PFBA, Perfluorobutanoic Acid (CAS number 375-22-4) .
- PFPeA, Perfluoropentanoic acid (CAS number 2706-90-3) .
- PFHxA, Perfluorohexanoic acid (CAS number 307-24-4) .
- PFHpA, Perfluoroheptanoic acid (CAS number 375-85-9) .
- PFOA, Perfluorooctanoic acid (CAS number 335-67-1) .
- PFNA, Perfluorononanoic acid (CAS number 375-95-1) .
- PFDA, Perfluorodecanoic acid (CAS number 335-76-2) .
- PFUnA, Perfluoroundecanoic acid (CAS number 2058-94-8) .
- PFDoA, Perfluorododecanoic acid (CAS number 307-55-1) .

The unknown samples and their standard solutions were mixed with the same amount of Internal Standard containing modified PFAS compounds in which some ^{12}C atoms have been replaced with ^{13}C atoms. These modified compounds are called M-PFAS. The addition of the internal standard is necessary when dealing with complex matrices to verify the efficiency of the analysis by checking the recovery of the internal standard at the end of the determination. The internal standard consists of a mixture containing the following types of modified PFAS:

- MPFHxS
- MPFOS
- MPFBA
- MPFHxA
- MPFOA
- MPFNA
- MPFDA
- MPFUnA
- MPFDoA

The samples and standard solutions were then transferred to microvials for the determination of PFAS concentration by UPLC analysis. The equipment's software calculates the analyte concentration with the following formula (Equation S1):

$$C_x = (A_x * C_{is})/(A_{is} * RF) \qquad (S1)$$

Where:

C_x = concentration of the analyte

A_x = analyte peak abundance (or peak area)

A_{is} = internal standard peak abundance (or peak area)

C_{is} = internal standard concentration

RF = response factor

The equipment used was the WATERS XEVO TQ-S MICRO #QEE0345 (MS) coupled with a WATERS ACQUITY™ UPLC™ I-Class PLUS System(UPLC). The column used was the ACQUITY UPLC BEH C_{18} 1.7µm 2.1x100mm IVD. The solvents used were: A= H_2O-MeOH 98:2+2mM AmmAcetate B= Metanol+2mM AmmAcetate C= D= CAN+0.01%FA. The target sample temperature was 10.0°C, and the column temperature was 60°C. Injection volume was 25 µL. The following is the gradient table:

	Time (min)	*Flow Rate (mL/min)*	*%A*	*%B*	*%C*	*%D*	*Curve*
1.	Initial	0.350	90.0	10.0	0.0	0.0	Initial
2.	1.20	0.350	90.0	10.0	0.0	0.0	6
3.	4.00	0.350	50.0	50.0	0.0	0.0	6
4.	4.80	0.350	50.0	50.0	0.0	0.0	6
5.	9.00	0.350	5.0	95.0	0.0	0.0	6
6.	9.50	0.350	5.0	95.0	0.0	0.0	6
7.	10.00	0.350	90.0	10.0	0.0	0.0	6
8.	12.50	0.350	90.0	10.0	0.0	0.0	6

The ion source used in the MS analysis is electrospray ionisation with negative polarity. The acquisition mode utilised in the analysis is the Multiple Reaction Monitoring (MRM), which detects the transition from precursor to product. The following are the transitions and times used for each analysis:

Function	*MRM range*	*Time range (min)*	*Ion source*	*Analyte*
1	213.00->169.00	0.00 to 3.50	ES-	PFBA
2	217.00->172.00	0.00 to 3.50	ES-	MPFBA
3	263.01->219.01	3.00 to 6.50	ES-	PFPeA
4	2 mass pairs	5.00 to 7.50	ES-	PFBS
5	3 mass pairs	5.00 to 8.50	ES-	PFHxA
6	3 mass pairs	5.00 to 8.50	ES-	MPFHxA
7	3 mass pairs	7.00 to 9.50	ES-	PFHpA
8	3 mass pairs	7.00 to 9.50	ES-	PFHxS
9	2 mass pairs	7.00 to 9.50	ES-	MPFHxS
10	3 mass pairs	8.00 to 11.50	ES-	PFOA
11	415.00->370.00	8.00 to 11.50	ES-	M2PFOA
12	3 mass pairs	9.00 to 12.50	ES-	PFNA
13	2 mass pairs	9.00 to 12.50	ES-	MPFNA
14	4 mass pairs	Time 9.00 to 12.50	ES-	PFOS
15	2 mass pairs	Time 9.00 to 12.50	ES-	MPFOS
16	2 mass pairs	10.00 to 13.50	ES-	PFDA
17	515.00->470.00	10.00 to 13.50	ES-	MPFDA
18	2 mass pairs	11.00 to 14.00	ES-	PFUnDA
19	565.00->520.00	11.00 to 14.00	ES-	MPFUnA
20	2 mass pairs	11.00 to 14.00	ES-	PFDoDA
21	615.00->570.00	11.00 to 14.00	ES-	MPFDoA
22	2 mass pairs	11.00 to 16.00	ES-	PFTrDA
23	2 mass pairs	11.00 to 16.00	ES-	PFTeDA

The operator followed the operating sequence and quality controls of the analytical procedure established by the EPA 537 regulatory method. The sequence comprises:

- Reference calibration solutions with **at least 5 calibration points**;
- **Method Blank**: to verify that no contamination or interference is present in the field environment, laboratory environment, the reagents, or the apparatus, certifying the methodology is in control, accurate and precise;

- **Analytical Quality Control (AQC)**: Use of a Certified Reference Material (CRM) from a secondary source to verify accuracy;
- **Matrix Sample**: Actual sample taken from the environment.
- **Matrix Sample + Spike:** Sample fortified with known amounts of analytes to assess recovery and matrix effects;
- **Calibration Check Compound (CCC)**: A calibration standard used to verify ongoing calibration validity throughout the run;
- **Samples**: Analysis of real samples after instrument validation;
- **Final AQC**: Additional quality-control check to confirm method stability;
- **Final CCC**: Final confirmation that the calibration remains within the acceptable range;

The operator, as established by EPA 537, has to monitor:

- **Calibration curve correlation coefficient** (value$\geq$0.98);
- **Internal standard (IS) peak areas**: must be between 50% and 150% of the mean IS area obtained during calibration phase;
- **Matrix Spike Samples**: the relative percent difference from the theoretical value must be lower than 30%;
- **CCC:** the recovery must be between 50 and 150% of the nominal concentration;

Table S1: Inventory data of the clariflocculation technique, referring to 1m^3 of leachate entering the process.

Clariflocculation		
Substance	*Amount*	*unit*
Leachate	1	m^3
H_2SO_4	16.8	kg
$FeCl_3$	2.8	kg
$Ca(OH)_2$	18.2	kg
Anionic polyelectrolyte	1.0	kg
Sludge (obtained)*	10.4	kg
PFAS removal	20.60%	

Table S2: Inventory data of the clariflocculation with PAC in a single-step technique, referring to 1m^3 of leachate entering the process.

Clariflocculation with PAC (single step)					
PAC = 7.3 kg		**PAC = 17 kg**		**PAC = 33 kg**	
Substance	*Amount*	*Substance*	*Amount*	*Substance*	*Amount*
Leachate	1 m^3	Leachate	1 m^3	Leachate	1 m^3
H_2SO_4	16.8 kg	H_2SO_4	16.8 kg	H_2SO_4	16.8 kg
$FeCl_3$	2.8 kg	$FeCl_3$	2.8 kg	$FeCl_3$	2.8 kg
Polyelectrolyte	1.0 kg	Polyelectrolyte	1.0 kg	Polyelectrolyte	1.0 kg
$Ca(OH)_2$	15.8 kg	$Ca(OH)_2$	14.3 kg	$Ca(OH)_2$	12.7 kg

Sludge (obtained)*	20.8 kg	Sludge (obtained)*	45.2 kg	Sludge (obtained)*	84.8 kg
PFAS removal	64.50%	PFAS removal	92.40%	PFAS removal	98.90%

Table S3: Inventory data of the clariflocculation and PAC adsorption in a double-step technique, referring to 1m^3 of leachate entering the process.

Clariflocculation and PAC adsorption (double step)							
PAC = 3.3 kg		**PAC = 5 kg**		**PAC = 7.3 kg**		**PAC = 8.7 kg**	
Substance	*Amount*	*Substance*	*Amount*	*Substance*	*Amount*	*Substance*	*Amount*
Leachate	1 m^3	Leachate	1 m^3	Leachate	1 m^3	Leachate	1 m^3
H_2SO_4	16.8 kg	H_2SO_4	16.8 kg	H_2SO_4	16.8 kg	H_2SO_4	16.8 kg
$FeCl_3$	2.8 kg	$FeCl_3$	2.8 kg	$FeCl_3$	2.8 kg	$FeCl_3$	2.8 kg
$Ca(OH)_2$	18.2 kg	$Ca(OH)_2$	18.2 kg	$Ca(OH)_2$	18.2 kg	$Ca(OH)_2$	18.2 kg
Polyelect.	1.0 kg	Polyelect.	1.0 kg	Polyelect.	1.0 kg	Polyelect.	1.0 kg
Sludge (obtained)*	10.4 kg	Sludge (obtained)*	10.4 kg	Sludge (obtained)*	10.4 kg	Sludge (obtained)*	10.4 kg
PFAS removal	44.3%	PFAS removal	53.1%	PFAS removal	70.2%	PFAS removal	82.2%

Table S4: Inventory data of the Fenton oxidation technique, referring to 1m^3 of leachate entering the process.

Fenton oxidation		
Substance	*Amount*	*unit*
Leachate	1	m^3
H_2O_2	3.9	kg
$FeCl_2$	125	kg
$Ca(OH)_2$	119	kg
Anionic polyelectrolyte	6.0	kg
Sludge (obtained)*	59.4	kg
PFAS removal	62.30%	

*The compositions of the obtained sludges were assumed and considered representative of average sludges produced by a typical European wastewater treatment plant, as documented in ecoinvent, because they typically showed identical water content and no additional primary data (neither physical nor chemical characteristics were analysed), that even if they had been available, it would not have been possible to take them into account due to the lack of such precise data in the database used for background information provision. The contribution of the sludge management is made explicit within every scenario from Table S11 to Table S44, and the proxies used are:

- *Sewage sludge, 75% water, WWT, WW, average {Europe without Switzerland}| treatment of sewage sludge, 75% water, WWT, WW, average, sanitary landfill*

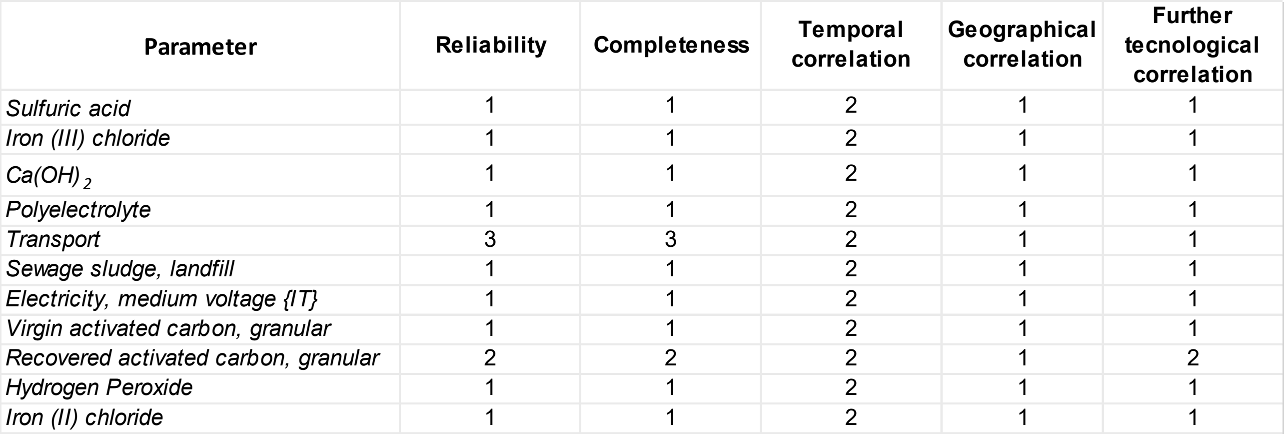
- Sewage sludge, 70% water, WWT, WW, average {Europe without Switzerland}| treatment of sewage sludge, 70% water, WWT, WW, average, municipal incineration.

Since the focus of the study is the calculation of the environmental impact of the system, a small variation in the sludge composition does not change the end-of-life impact of the sludge, also considering that the most impactful phases of the sludge management are composition-independent phases, such as incineration or landfill leachate management.

Table S5: Electricity consumption of each technique for 1m^3 entering the process.

Process	Value	U.M.
Clariflocculation	0.824	kWh
PAC 7.3 SS	0.824	kWh
PAC 17 SS	0.824	kWh
PAC 33 SS	0.824	kWh
PAC 3.3 DS	0.824	kWh
PAC 5 DS	0.824	kWh
PAC 7.3 DS	0.824	kWh
PAC 8.7 DS	0.824	kWh
Fenton	0.873	kWh

Figure S1: Pedigree matrix reporting the scores assigned to the material and energy flows involved in the analyzed system.



Parameter	Reliability	Completeness	Temporal correlation	Geographical correlation	Further tecnological correlation
Sulfuric acid	1	1	2	1	1
Iron (III) chloride	1	1	2	1	1
Ca(OH)$_2$	1	1	2	1	1
Polyelectrolyte	1	1	2	1	1
Transport	3	3	2	1	1
Sewage sludge, landfill	1	1	2	1	1
Electricity, medium voltage {IT}	1	1	2	1	1
Virgin activated carbon, granular	1	1	2	1	1
Recovered activated carbon, granular	2	2	2	1	2
Hydrogen Peroxide	1	1	2	1	1
Iron (II) chloride	1	1	2	1	1

Table S6: Results at the endpoint level of each technique for 1m^3 entering the process (incineration scenario). Method: ReCiPe 2016 v1.1 endpoint, Hierarchist perspective.

Impact category	**Unit**	**Chiar.**	**7.3kg PAC SS**	**17kg PAC SS**	**33kg PAC SS**	**3.3kg PAC DS**	**5kg PAC DS**	**7.3kg PAC DS**	**8.7kg PAC DS**	**Fenton**
Total	mPt	7.22E-01	1.88E+00	3.51E+00	6.19E+00	8.62E-01	9.34E-01	1.03E+00	1.09E+00	1.92E+00
Global warming, Human health	mPt	1.53E-01	5.43E-01	1.08E+00	1.98E+00	2.09E-01	2.38E-01	2.76E-01	3.00E-01	7.28E-01
Global warming, Terrestrial ecosystems	mPt	7.49E-03	2.66E-02	5.30E-02	9.66E-02	1.02E-02	1.16E-02	1.35E-02	1.47E-02	3.56E-02
Global warming, Freshwater ecosystems	mPt	2.05E-07	7.25E-07	1.45E-06	2.64E-06	2.79E-07	3.17E-07	3.69E-07	4.01E-07	9.73E-07
Stratospheric ozone depletion	mPt	2.08E-04	4.30E-04	9.08E-04	1.69E-03	2.15E-04	2.19E-04	2.24E-04	2.26E-04	1.09E-03
Ionizing radiation	mPt	5.92E-05	1.80E-04	3.43E-04	6.11E-04	1.18E-04	1.48E-04	1.89E-04	2.13E-04	1.69E-04
Ozone formation, Human health	mPt	3.58E-04	1.34E-03	2.74E-03	5.05E-03	4.70E-04	5.27E-04	6.05E-04	6.53E-04	1.46E-03
Fine particulate matter formation	mPt	3.70E-01	8.51E-01	1.50E+00	2.58E+00	4.23E-01	4.51E-01	4.88E-01	5.10E-01	3.83E-01
Ozone formation, Terrestrial ecosystems	mPt	8.52E-04	3.14E-03	6.42E-03	1.18E-02	1.12E-03	1.25E-03	1.44E-03	1.55E-03	3.51E-03
Terrestrial acidification	mPt	6.23E-03	1.30E-02	2.23E-02	3.75E-02	7.02E-03	7.43E-03	7.98E-03	8.31E-03	5.57E-03
Freshwater eutrophication	mPt	1.05E-03	3.84E-03	8.15E-03	1.52E-02	1.28E-03	1.40E-03	1.56E-03	1.66E-03	4.73E-03
Marine eutrophication	mPt	8.06E-07	1.28E-06	2.11E-06	3.46E-06	8.43E-07	8.63E-07	8.89E-07	9.04E-07	4.59E-06
Terrestrial ecotoxicity	mPt	2.44E-04	3.31E-04	4.61E-04	6.75E-04	2.59E-04	2.66E-04	2.76E-04	2.83E-04	4.36E-04
Freshwater ecotoxicity	mPt	1.83E-04	3.31E-04	5.93E-04	1.02E-03	1.94E-04	2.00E-04	2.08E-04	2.13E-04	6.68E-04
Marine ecotoxicity	mPt	3.70E-05	6.75E-05	1.21E-04	2.08E-04	3.94E-05	4.06E-05	4.22E-05	4.32E-05	1.33E-04
Human carcinogenic toxicity	mPt	8.39E-02	2.28E-01	4.37E-01	7.82E-01	1.00E-01	1.08E-01	1.20E-01	1.26E-01	4.20E-01
Human non-carcinogenic toxicity	mPt	8.12E-02	1.85E-01	3.51E-01	6.24E-01	8.95E-02	9.38E-02	9.96E-02	1.03E-01	2.87E-01
Land use	mPt	6.27E-04	1.60E-03	2.93E-03	5.12E-03	7.50E-04	8.13E-04	8.99E-04	9.51E-04	1.75E-03
Mineral resource scarcity	mPt	7.97E-05	1.05E-04	1.43E-04	2.07E-04	8.42E-05	8.66E-05	8.98E-05	9.17E-05	1.78E-04
Fossil resource scarcity	mPt	5.65E-03	1.36E-02	2.48E-02	4.32E-02	7.23E-03	8.04E-03	9.14E-03	9.81E-03	2.88E-02
Water consumption, Human health	mPt	9.54E-03	1.02E-02	1.12E-02	1.28E-02	9.90E-03	1.01E-02	1.03E-02	1.05E-02	2.12E-02
Water consumption, Terrestrial ecosystem	mPt	9.41E-04	1.01E-03	1.10E-03	1.27E-03	9.70E-04	9.85E-04	1.01E-03	1.02E-03	2.08E-03
Water consumption, Aquatic ecosystems	mPt	5.14E-08	8.49E-08	1.30E-07	2.05E-07	5.44E-08	5.59E-08	5.80E-08	5.93E-08	1.21E-07
GWP		22%	30%	32%	33%	25%	27%	28%	29%	40%
PMFP		51%	45%	43%	42%	49%	48%	47%	47%	20%
HUMAN c-TOX		12%	12%	12%	13%	12%	12%	12%	12%	22%
HUMAN nc-TOX		11%	10%	10%	10%	10%	10%	10%	9%	15%
GWP+PMFP+HTc+HTnc		96%	97%	98%	98%	97%	97%	97%	97%	96%

Table S7: Results at the endpoint level of each technique for 1m^3 entering the process (landfilling scenario). Method: ReCiPe 2016 v1.1 endpoint, Hierarchist perspective.

Impact category	**Unit**	**Chiar.**	**7.3kg PAC SS**	**17kg PAC SS**	**33kg PAC SS**	**3.3kg PAC DS**	**5kg PAC DS**	**7.3kg PAC DS**	**8.7kg PAC DS**	**Fenton**
Total	mPt	8.21E-01	2.08E+00	3.94E+00	7.00E+00	9.61E-01	1.03E+00	1.13E+00	1.19E+00	2.49E+00
Global warming, Human health	mPt	2.33E-01	7.02E-01	1.43E+00	2.62E+00	2.89E-01	3.17E-01	3.56E-01	3.80E-01	1.18E+00
Global warming, Terrestrial ecosystems	mPt	1.14E-02	3.43E-02	6.99E-02	1.28E-01	1.41E-02	1.55E-02	1.74E-02	1.86E-02	5.78E-02
Global warming, Freshwater ecosystems	mPt	3.11E-07	9.38E-07	1.91E-06	3.50E-06	3.85E-07	4.24E-07	4.75E-07	5.07E-07	1.58E-06
Stratospheric ozone depletion	mPt	2.89E-05	7.09E-05	1.28E-04	2.23E-04	3.58E-05	3.93E-05	4.41E-05	4.70E-05	6.56E-05
Ionizing radiation	mPt	5.87E-05	1.79E-04	3.41E-04	6.06E-04	1.17E-04	1.47E-04	1.88E-04	2.13E-04	1.66E-04
Ozone formation, Human health	mPt	2.82E-04	1.18E-03	2.41E-03	4.43E-03	3.94E-04	4.51E-04	5.30E-04	5.77E-04	1.02E-03
Fine particulate matter formation	mPt	3.66E-01	8.43E-01	1.48E+00	2.54E+00	4.19E-01	4.46E-01	4.84E-01	5.06E-01	3.59E-01
Ozone formation, Terrestrial ecosystems	mPt	6.78E-04	2.79E-03	5.67E-03	1.04E-02	9.43E-04	1.08E-03	1.26E-03	1.38E-03	2.52E-03
Terrestrial acidification	mPt	6.15E-03	1.29E-02	2.19E-02	3.69E-02	6.94E-03	7.35E-03	7.90E-03	8.24E-03	5.14E-03
Freshwater eutrophication	mPt	1.64E-03	5.02E-03	1.07E-02	2.00E-02	1.87E-03	1.99E-03	2.15E-03	2.25E-03	8.11E-03
Marine eutrophication	mPt	6.20E-07	9.10E-07	1.30E-06	1.94E-06	6.57E-07	6.76E-07	7.02E-07	7.18E-07	3.53E-06
Terrestrial ecotoxicity	mPt	2.41E-04	3.25E-04	4.49E-04	6.53E-04	2.56E-04	2.64E-04	2.74E-04	2.80E-04	4.20E-04
Freshwater ecotoxicity	mPt	2.25E-04	4.15E-04	7.74E-04	1.36E-03	2.36E-04	2.42E-04	2.50E-04	2.54E-04	9.06E-04
Marine ecotoxicity	mPt	4.61E-05	8.56E-05	1.60E-04	2.82E-04	4.84E-05	4.97E-05	5.13E-05	5.23E-05	1.85E-04
Human carcinogenic toxicity	mPt	6.94E-02	1.99E-01	3.74E-01	6.64E-01	8.56E-02	9.39E-02	1.05E-01	1.12E-01	3.37E-01
Human non-carcinogenic toxicity	mPt	1.15E-01	2.52E-01	4.99E-01	9.01E-01	1.23E-01	1.28E-01	1.34E-01	1.37E-01	4.80E-01
Land use	mPt	6.53E-04	1.65E-03	3.04E-03	5.33E-03	7.76E-04	8.39E-04	9.25E-04	9.77E-04	1.90E-03
Mineral resource scarcity	mPt	7.64E-05	9.84E-05	1.29E-04	1.80E-04	8.09E-05	8.33E-05	8.65E-05	8.84E-05	1.59E-04
Fossil resource scarcity	mPt	5.58E-03	1.35E-02	2.45E-02	4.26E-02	7.16E-03	7.97E-03	9.07E-03	9.74E-03	2.84E-02
Water consumption, Human health	mPt	9.60E-03	1.03E-02	1.14E-02	1.33E-02	9.96E-03	1.01E-02	1.04E-02	1.05E-02	2.15E-02
Water consumption, Terrestrial ecosystem	mPt	9.46E-04	1.02E-03	1.13E-03	1.31E-03	9.76E-04	9.91E-04	1.01E-03	1.02E-03	2.11E-03
Water consumption, Aquatic ecosystems	mPt	5.16E-08	8.53E-08	1.31E-07	2.07E-07	5.46E-08	5.61E-08	5.82E-08	5.95E-08	1.22E-07
GWP		30%	35%	38%	39%	32%	32%	33%	33%	50%
PMFP		45%	41%	38%	36%	44%	43%	43%	43%	14%
HUMAN c-TOX		8%	10%	10%	9%	9%	9%	9%	9%	14%
HUMAN nc-TOX		14%	12%	13%	13%	13%	12%	12%	12%	19%
GWP+PMFP+HTc+HTnc		97%	98%	98%	98%	97%	97%	97%	97%	97%

Table S8: Results at the endpoint level of each technique for 1g of PFAS removed (incineration scenario). Method: ReCiPe 2016 v1.1 endpoint, Hierarchist perspective.

Impact category	**Unit**	**Chiar.**	**7.3kg PAC SS**	**17kg PAC SS**	**33kg PAC SS**	**3.3kg PAC DS**	**5kg PAC DS**	**7.3kg PAC DS**	**8.7kg PAC DS**	**Fenton**
Total	mPt	1.01E+02	7.65E+01	9.86E+01	1.62E+02	5.20E+01	4.65E+01	3.85E+01	3.46E+01	8.99E+01
Global warming, Human health	mPt	2.14E+01	2.21E+01	3.04E+01	5.18E+01	1.26E+01	1.18E+01	1.03E+01	9.51E+00	3.40E+01
Global warming, Terrestrial ecosystems	mPt	1.04E+00	1.08E+00	1.49E+00	2.53E+00	6.16E-01	5.79E-01	5.04E-01	4.65E-01	1.66E+00
Global warming, Freshwater ecosystems	mPt	2.85E-05	2.95E-05	4.07E-05	6.92E-05	1.68E-05	1.58E-05	1.38E-05	1.27E-05	4.54E-05
Stratospheric ozone depletion	mPt	2.90E-02	1.75E-02	2.55E-02	4.42E-02	1.30E-02	1.09E-02	8.34E-03	7.18E-03	5.10E-02
Ionizing radiation	mPt	8.26E-03	7.33E-03	9.63E-03	1.60E-02	7.10E-03	7.37E-03	7.03E-03	6.77E-03	7.89E-03
Ozone formation, Human health	mPt	4.99E-02	5.43E-02	7.70E-02	1.32E-01	2.83E-02	2.63E-02	2.26E-02	2.07E-02	6.81E-02
Fine particulate matter formation	mPt	5.16E+01	3.46E+01	4.22E+01	6.76E+01	2.55E+01	2.25E+01	1.82E+01	1.62E+01	1.79E+01
Ozone formation, Terrestrial ecosystems	mPt	1.19E-01	1.28E-01	1.80E-01	3.10E-01	6.74E-02	6.25E-02	5.36E-02	4.92E-02	1.64E-01
Terrestrial acidification	mPt	8.68E-01	5.30E-01	6.26E-01	9.84E-01	4.23E-01	3.70E-01	2.98E-01	2.64E-01	2.60E-01
Freshwater eutrophication	mPt	1.46E-01	1.56E-01	2.29E-01	3.99E-01	7.72E-02	6.97E-02	5.81E-02	5.25E-02	2.21E-01
Marine eutrophication	mPt	1.12E-04	5.22E-05	5.93E-05	9.08E-05	5.09E-05	4.30E-05	3.31E-05	2.87E-05	2.15E-04
Terrestrial ecotoxicity	mPt	3.40E-02	1.34E-02	1.29E-02	1.77E-02	1.56E-02	1.33E-02	1.03E-02	8.96E-03	2.03E-02
Freshwater ecotoxicity	mPt	2.55E-02	1.35E-02	1.66E-02	2.68E-02	1.17E-02	9.97E-03	7.75E-03	6.74E-03	3.12E-02
Marine ecotoxicity	mPt	5.16E-03	2.74E-03	3.40E-03	5.47E-03	2.38E-03	2.02E-03	1.58E-03	1.37E-03	6.24E-03
Human carcinogenic toxicity	mPt	1.17E+01	9.25E+00	1.23E+01	2.05E+01	6.04E+00	5.40E+00	4.46E+00	4.01E+00	1.96E+01
Human non-carcinogenic toxicity	mPt	1.13E+01	7.50E+00	9.86E+00	1.64E+01	5.40E+00	4.67E+00	3.71E+00	3.27E+00	1.34E+01
Land use	mPt	8.74E-02	6.50E-02	8.23E-02	1.34E-01	4.52E-02	4.05E-02	3.35E-02	3.01E-02	8.19E-02
Mineral resource scarcity	mPt	1.11E-02	4.27E-03	4.03E-03	5.42E-03	5.08E-03	4.32E-03	3.35E-03	2.91E-03	8.31E-03
Fossil resource scarcity	mPt	7.88E-01	5.54E-01	6.97E-01	1.13E+00	4.36E-01	4.01E-01	3.41E-01	3.11E-01	1.35E+00
Water consumption, Human health	mPt	1.33E+00	4.14E-01	3.14E-01	3.37E-01	5.97E-01	5.03E-01	3.86E-01	3.33E-01	9.89E-01
Water consumption, Terrestrial ecosystem	mPt	1.31E-01	4.09E-02	3.10E-02	3.33E-02	5.85E-02	4.91E-02	3.75E-02	3.23E-02	9.73E-02
Water consumption, Aquatic ecosystems	mPt	7.17E-06	3.45E-06	3.66E-06	5.38E-06	3.28E-06	2.79E-06	2.16E-06	1.88E-06	5.67E-06
GWP		22%	30%	32%	33%	25%	27%	28%	29%	40%
PMFP		51%	45%	43%	42%	49%	48%	47%	47%	20%
HUMAN c-TOX		12%	12%	12%	13%	12%	12%	12%	12%	22%
HUMAN nc-TOX		11%	10%	10%	10%	10%	10%	10%	9%	15%
GWP+PMFP+HTc+HTnc		96%	97%	98%	98%	97%	97%	97%	97%	96%

Table S9: Results at the endpoint level of each technique for 1g of PFAS removed (landfilling scenario). Method: ReCiPe 2016 v1.1 endpoint, Hierarchist perspective.

Impact category	**Unit**	**Chiar.**	**7.3kg PAC SS**	**17kg PAC SS**	**33kg PAC SS**	**3.3kg PAC DS**	**5kg PAC DS**	**7.3kg PAC DS**	**8.7kg PAC DS**	**Fenton**
Total	mPt	1.14E+02	8.45E+01	1.11E+02	1.84E+02	5.79E+01	5.15E+01	4.21E+01	3.77E+01	1.16E+02
Global warming, Human health	mPt	3.25E+01	2.85E+01	4.01E+01	6.88E+01	1.74E+01	1.58E+01	1.33E+01	1.20E+01	5.53E+01
Global warming, Terrestrial ecosystems	mPt	1.59E+00	1.40E+00	1.96E+00	3.37E+00	8.51E-01	7.73E-01	6.49E-01	5.89E-01	2.70E+00
Global warming, Freshwater ecosystems	mPt	4.33E-05	3.81E-05	5.36E-05	9.19E-05	2.32E-05	2.11E-05	1.77E-05	1.61E-05	7.38E-05
Stratospheric ozone depletion	mPt	4.03E-03	2.88E-03	3.60E-03	5.84E-03	2.16E-03	1.96E-03	1.64E-03	1.49E-03	3.06E-03
Ionizing radiation	mPt	8.18E-03	7.29E-03	9.57E-03	1.59E-02	7.07E-03	7.34E-03	7.01E-03	6.75E-03	7.74E-03
Ozone formation, Human health	mPt	3.93E-02	4.81E-02	6.77E-02	1.16E-01	2.38E-02	2.25E-02	1.98E-02	1.83E-02	4.79E-02
Fine particulate matter formation	mPt	5.10E+01	3.43E+01	4.17E+01	6.67E+01	2.53E+01	2.23E+01	1.80E+01	1.60E+01	1.68E+01
Ozone formation, Terrestrial ecosystems	mPt	9.45E-02	1.14E-01	1.59E-01	2.73E-01	5.69E-02	5.38E-02	4.71E-02	4.36E-02	1.18E-01
Terrestrial acidification	mPt	8.58E-01	5.24E-01	6.16E-01	9.68E-01	4.19E-01	3.66E-01	2.95E-01	2.61E-01	2.40E-01
Freshwater eutrophication	mPt	2.29E-01	2.04E-01	3.01E-01	5.25E-01	1.13E-01	9.91E-02	8.02E-02	7.12E-02	3.79E-01
Marine eutrophication	mPt	8.64E-05	3.70E-05	3.65E-05	5.09E-05	3.96E-05	3.37E-05	2.62E-05	2.28E-05	1.65E-04
Terrestrial ecotoxicity	mPt	3.36E-02	1.32E-02	1.26E-02	1.71E-02	1.54E-02	1.31E-02	1.02E-02	8.88E-03	1.96E-02
Freshwater ecotoxicity	mPt	3.14E-02	1.69E-02	2.18E-02	3.57E-02	1.42E-02	1.21E-02	9.31E-03	8.07E-03	4.23E-02
Marine ecotoxicity	mPt	6.43E-03	3.48E-03	4.50E-03	7.40E-03	2.92E-03	2.47E-03	1.91E-03	1.66E-03	8.65E-03
Human carcinogenic toxicity	mPt	9.68E+00	8.08E+00	1.05E+01	1.74E+01	5.16E+00	4.68E+00	3.92E+00	3.55E+00	1.57E+01
Human non-carcinogenic toxicity	mPt	1.61E+01	1.03E+01	1.40E+01	2.36E+01	7.45E+00	6.37E+00	4.98E+00	4.35E+00	2.24E+01
Land use	mPt	9.11E-02	6.71E-02	8.54E-02	1.40E-01	4.68E-02	4.18E-02	3.45E-02	3.10E-02	8.88E-02
Mineral resource scarcity	mPt	1.06E-02	4.00E-03	3.63E-03	4.72E-03	4.88E-03	4.15E-03	3.23E-03	2.80E-03	7.43E-03
Fossil resource scarcity	mPt	7.78E-01	5.49E-01	6.88E-01	1.12E+00	4.32E-01	3.97E-01	3.38E-01	3.09E-01	1.33E+00
Water consumption, Human health	mPt	1.34E+00	4.19E-01	3.21E-01	3.49E-01	6.01E-01	5.06E-01	3.88E-01	3.34E-01	1.00E+00
Water consumption, Terrestrial ecosystem	mPt	1.32E-01	4.13E-02	3.16E-02	3.44E-02	5.88E-02	4.94E-02	3.77E-02	3.25E-02	9.87E-02
Water consumption, Aquatic ecosystems	mPt	7.19E-06	3.47E-06	3.68E-06	5.42E-06	3.29E-06	2.80E-06	2.17E-06	1.89E-06	5.72E-06
GWP		30%	35%	38%	39%	32%	32%	33%	33%	50%
PMFP		45%	41%	38%	36%	44%	43%	43%	43%	14%
HUMAN c-TOX		8%	10%	10%	9%	9%	9%	9%	9%	14%
HUMAN nc-TOX		14%	12%	13%	13%	13%	12%	12%	12%	19%
GWP+PMFP+HTc+HTnc		97%	98%	98%	98%	97%	97%	97%	97%	97%

Figure S2: Graphical representation of the comparison of single score (landfilling and incineration scenarios) of each technique for 1m³ of leachate entering the process.

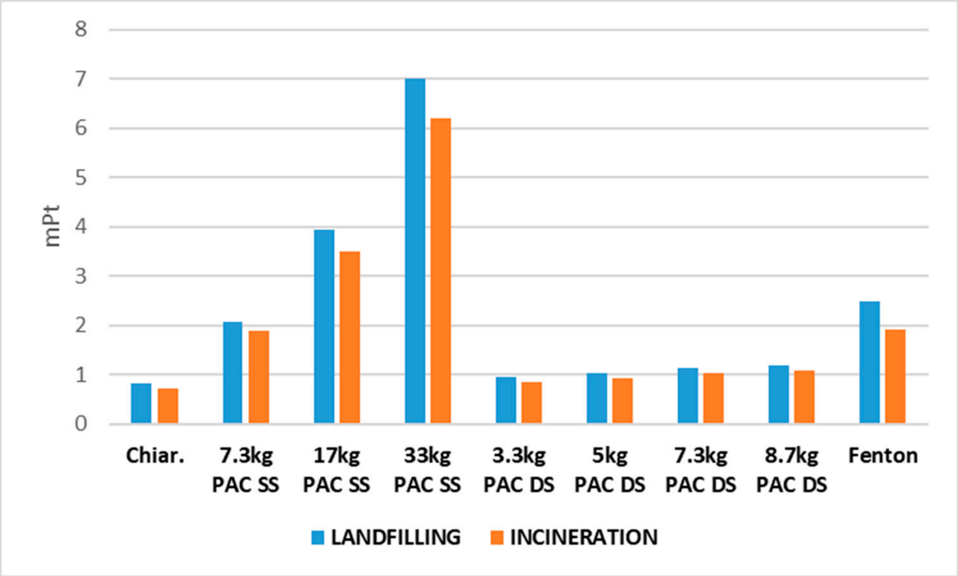


Figure S3: Graphical representation of the comparison of single score (landfilling and incineration scenarios) of each technique for 1g of PFAS removed.

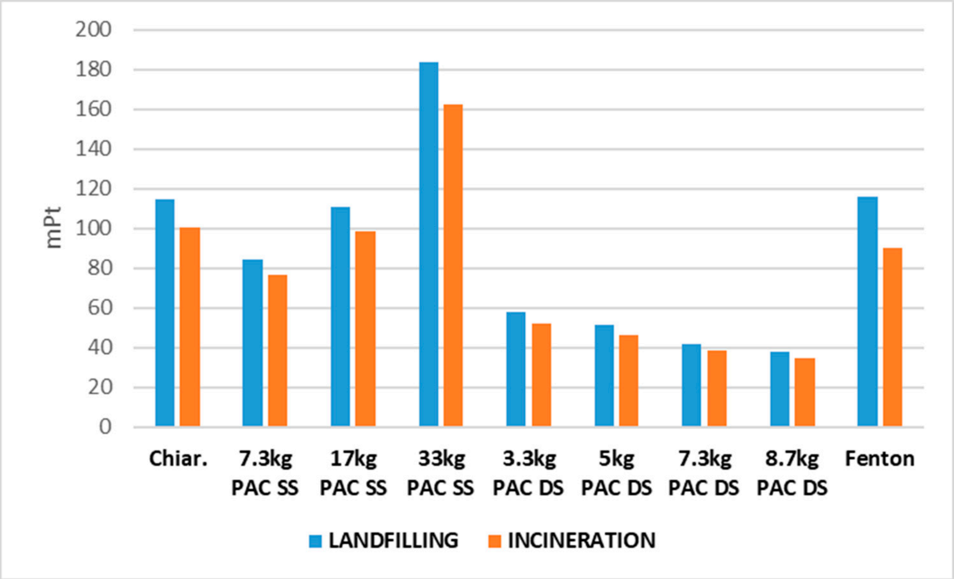


Table S10: Results of PFAS removal efficiency measures.

Process	PFAS in (ng/L)	PFAS out (ng/L)	Removal (%)	Average
Clariflocculation	40610	35855	11.7	20.6
Clariflocculation	40610	32889	19.0	
Clariflocculation	44613	35518	20.4	
Clariflocculation	44613	35644	20.1	
Clariflocculation	44613	30374	31.9	
PAC 7.3g/L SS	38923	12808	68.5	64.5
PAC 7.3g/L SS	44613	16569	62.9	
PAC 7.3g/L SS	44613	16973	62.0	
PAC 17g/L SS	38923	4450	89.0	92.4

PAC 17g/L SS	44613	3412	92.4	
PAC 17g/L SS	44613	2267	94.9	
PAC 17g/L SS	44613	3039	93.2	
PAC 33g/L SS	38923	968	97.6	98.9
PAC 33g/L SS	44613	255	99.4	
PAC 33g/L SS	44613	271	99.4	
PAC 33g/L SS	44613	413	99.1	
PAC 3.3g/L DS	40610	20574	49.3	44.3
PAC 3.3g/L DS	40610	22445	44.7	
PAC 3.3g/L DS	44613	27349	38.7	
PAC 3.3g/L DS	44613	31656	29.0	
PAC 5.0g/L DS	40610	28133	30.7	53.1
PAC 5.0g/L DS	40610	15160	62.7	
PAC 5.0g/L DS	44613	26745	40.1	
PAC 5.0g/L DS	44613	19406	56.5	
PAC 7.3g/L DS	40610	12039	70.4	70.2
PAC 7.3g/L DS	40610	13825	69.0	
PAC 7.3g/L DS	44613	26745	69.4	
PAC 7.3g/L DS	44613	19406	72.0	
PAC 8.7g/L DS	40610	4523	88.9	82.2
PAC 8.7g/L DS	44613	7617	82.9	
PAC 8.7g/L DS	44613	11193	74.9	
Fenton	25975	12281	52.7	62.3
Fenton	25975	10407	59.9	
Fenton	9650	3685	61.8	
Fenton	9650	2805	70.9	
Fenton	40610	12570	69.0	
Fenton	40610	16837	58.5	
Fenton	40610	18533	54.4	
Fenton	44613	17678	60.4	
Fenton	44613	11953	73.2	

Table S11: Environmental impacts of **CLARIFLOCCULATION** for 1m^3 of leachate entering the process. **(Incineration scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO_2 eq	9.693	1.038	2.265	2.477	1.696	0.947	0.957	0.312
Stratospheric ozone depletion	kg CFC_{11} eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	0.411	0.121	0.187	0.007	0.034	0.015	0.005	0.042
Ozone formation, Human health	kg NO_x eq	0.023	0.003	0.007	0.001	0.003	0.003	0.006	0.000
Fine particulate matter formation	kg PM2.5 eq	0.036	0.026	0.006	0.001	0.002	0.001	0.001	0.000
Ozone formation, Terrestrial ecosystems	kg NO_x eq	0.024	0.003	0.007	0.001	0.003	0.003	0.006	0.001
Terrestrial acidification	kg SO_2 eq	0.111	0.087	0.011	0.002	0.006	0.002	0.003	0.001
Freshwater eutrophication	kg P eq	0.006	0.000	0.001	0.000	0.001	0.000	0.003	0.000
Marine eutrophication	kg N eq	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	89.252	39.959	28.278	0.119	4.563	14.866	1.268	0.198
Freshwater ecotoxicity	kg 1,4-DCB	0.916	0.178	0.330	0.001	0.048	0.023	0.329	0.008
Marine ecotoxicity	kg 1,4-DCB	1.225	0.252	0.429	0.001	0.063	0.039	0.430	0.010
Human carcinogenic toxicity	kg 1,4-DCB	0.720	0.138	0.296	0.001	0.060	0.047	0.150	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	19.434	4.551	5.792	0.061	0.975	0.737	7.160	0.158
Land use	m^{2}a crop eq	0.209	0.045	0.095	0.001	0.020	0.038	0.003	0.007
Mineral resource scarcity	kg Cu eq	0.047	0.013	0.025	0.000	0.004	0.002	0.002	0.000
Fossil resource scarcity	kg oil eq	2.301	0.292	0.563	0.209	0.744	0.299	0.090	0.105
Water consumption	m^3	0.880	0.181	0.048	0.623	0.019	0.002	0.003	0.004

Table S12: Environmental impacts of **CLARIFLOCCULATION** for 1g of PFAS removed. **(Incineration scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO_2 eq	1351.238	144.715	315.705	345.386	236.506	131.981	133.436	43.509
Stratospheric ozone depletion	kg CFC_{11} eq	0.003	0.000	0.000	0.000	0.000	0.000	0.003	0.000
Ionizing radiation	kBq Co-60 eq	57.361	16.918	26.079	0.981	4.764	2.110	0.681	5.828
Ozone formation, Human health	kg NO_x eq	3.235	0.448	0.918	0.185	0.399	0.399	0.819	0.067
Fine particulate matter formation	kg PM2.5 eq	5.007	3.591	0.792	0.081	0.268	0.116	0.122	0.037
Ozone formation, Terrestrial ecosystems	kg NO_x eq	3.334	0.469	0.930	0.189	0.423	0.426	0.825	0.072
Terrestrial acidification	kg SO_2 eq	15.513	12.166	1.508	0.240	0.905	0.248	0.352	0.094
Freshwater eutrophication	kg P eq	0.790	0.061	0.178	0.001	0.072	0.010	0.457	0.010
Marine eutrophication	kg N eq	0.246	0.005	0.014	0.000	0.165	0.004	0.057	0.001
Terrestrial ecotoxicity	kg 1,4-DCB	12442.560	5570.624	3942.304	16.555	636.156	2072.476	176.784	27.661
Freshwater ecotoxicity	kg 1,4-DCB	127.656	24.772	45.992	0.098	6.639	3.211	45.811	1.132
Marine ecotoxicity	kg 1,4-DCB	170.745	35.136	59.844	0.155	8.767	5.411	59.969	1.463
Human carcinogenic toxicity	kg 1,4-DCB	100.426	19.250	41.311	0.148	8.420	6.561	20.901	3.836
Human non-carcinogenic toxicity	kg 1,4-DCB	2709.304	634.448	807.436	8.461	135.984	102.785	998.201	21.988
Land use	m^2a crop eq	29.206	6.254	13.256	0.168	2.764	5.246	0.476	1.041
Mineral resource scarcity	kg Cu eq	6.546	1.779	3.483	0.019	0.544	0.343	0.318	0.060
Fossil resource scarcity	kg oil eq	320.791	40.756	78.451	29.142	103.654	41.620	12.600	14.569
Water consumption	m^3	122.722	25.247	6.669	86.815	2.710	0.261	0.432	0.586

Table S13: Environmental impacts of **PAC 7.3 SS** for 1m^3 of leachate entering the process. **(Incineration scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**Ca(OH)$_2$**	**Polyelectrolyte**	**Transport**	**Activated carbon, granular**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO$_2$ eq	35.073	1.050	2.265	2.150	1.881	1.254	24.251	1.910	0.312
Stratospheric ozone depletion	kg CFC$_{11}$ eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.275	0.117	0.187	0.006	0.047	0.018	0.848	0.011	0.042
Ozone formation, Human health	kg NO$_x$ eq	0.088	0.003	0.007	0.001	0.003	0.004	0.058	0.012	0.000
Fine particulate matter formation	kg PM2.5 eq	0.081	0.025	0.006	0.001	0.002	0.001	0.045	0.002	0.000
Ozone formation, Terrestrial ecosystems	kg NO$_x$ eq	0.090	0.003	0.007	0.001	0.004	0.004	0.059	0.012	0.001
Terrestrial acidification	kg SO$_2$ eq	0.227	0.085	0.011	0.001	0.006	0.002	0.116	0.005	0.001
Freshwater eutrophication	kg P eq	0.021	0.001	0.001	0.000	0.001	0.000	0.012	0.007	0.000
Marine eutrophication	kg N eq	0.003	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	107.218	31.860	28.278	0.086	2.954	19.065	22.406	2.370	0.198
Freshwater ecotoxicity	kg 1,4-DCB	1.769	0.212	0.330	0.001	0.068	0.035	0.449	0.667	0.008
Marine ecotoxicity	kg 1,4-DCB	2.376	0.293	0.429	0.001	0.089	0.057	0.623	0.874	0.010
Human carcinogenic toxicity	kg 1,4-DCB	4.111	0.468	0.296	0.002	0.263	0.225	2.257	0.572	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	48.536	5.525	5.792	0.057	1.643	1.096	19.600	14.666	0.158
Land use	m^{2}a crop eq	0.645	0.055	0.095	0.001	0.035	0.055	0.388	0.010	0.007
Mineral resource scarcity	kg Cu eq	0.064	0.013	0.025	0.000	0.005	0.003	0.012	0.004	0.000
Fossil resource scarcity	kg oil eq	8.870	0.310	0.563	0.198	0.791	0.397	6.314	0.194	0.105
Water consumption	m^3	0.353	0.180	0.048	0.038	0.019	0.002	0.055	0.006	0.004

Table S14: Environmental impacts of **PAC 7.3 SS** for 1g of PFAS removed. **(Incineration scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO_2 eq	1425.365	42.674	92.033	87.388	76.439	50.950	985.576	77.623	12.683
Stratospheric ozone depletion	kg CFC_{11} eq	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000
Ionizing radiation	kBq Co-60 eq	51.826	4.744	7.602	0.252	1.892	0.741	34.461	0.434	1.699
Ozone formation, Human health	kg NO_x eq	3.577	0.130	0.268	0.047	0.131	0.153	2.351	0.477	0.020
Fine particulate matter formation	kg PM2.5 eq	3.302	1.019	0.231	0.020	0.083	0.044	1.823	0.070	0.011
Ozone formation, Terrestrial ecosystems	kg NO_x eq	3.660	0.136	0.271	0.048	0.145	0.164	2.396	0.480	0.021
Terrestrial acidification	kg SO_2 eq	9.244	3.448	0.440	0.061	0.256	0.094	4.714	0.205	0.027
Freshwater eutrophication	kg P eq	0.862	0.022	0.052	0.000	0.024	0.004	0.492	0.265	0.003
Marine eutrophication	kg N eq	0.113	0.001	0.004	0.000	0.048	0.001	0.026	0.033	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	4357.335	1294.801	1149.238	3.490	120.046	774.822	910.566	96.309	8.064
Freshwater ecotoxicity	kg 1,4-DCB	71.912	8.617	13.407	0.029	2.758	1.418	18.241	27.111	0.330
Marine ecotoxicity	kg 1,4-DCB	96.563	11.896	17.445	0.045	3.622	2.309	25.301	35.517	0.426
Human carcinogenic toxicity	kg 1,4-DCB	167.088	19.003	12.043	0.094	10.692	9.153	91.730	23.254	1.118
Human non-carcinogenic toxicity	kg 1,4-DCB	1972.518	224.516	235.379	2.309	66.776	44.552	796.545	596.030	6.410
Land use	m^2a crop eq	26.229	2.222	3.864	0.044	1.425	2.231	15.751	0.389	0.304
Mineral resource scarcity	kg Cu eq	2.586	0.526	1.015	0.005	0.205	0.133	0.502	0.182	0.017
Fossil resource scarcity	kg oil eq	360.465	12.599	22.869	8.030	32.132	16.124	256.597	7.866	4.247
Water consumption	m^3	14.339	7.335	1.944	1.552	0.760	0.088	2.241	0.248	0.171

Table S15: Environmental impacts of **PAC 17 SS** for 1m^3 of leachate entering the process. **(Incineration scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO_2 eq	69.968	1.050	2.265	1.947	1.881	1.887	56.476	4.151	0.312
Stratospheric ozone depletion	kg CFC_{11} eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	2.423	0.117	0.187	0.006	0.047	0.027	1.975	0.023	0.042
Ozone formation, Human health	kg NO_x eq	0.180	0.003	0.007	0.001	0.003	0.006	0.135	0.026	0.000
Fine particulate matter formation	kg PM2.5 eq	0.143	0.025	0.006	0.000	0.002	0.002	0.104	0.004	0.000
Ozone formation, Terrestrial ecosystems	kg NO_x eq	0.184	0.003	0.007	0.001	0.004	0.006	0.137	0.026	0.001
Terrestrial acidification	kg SO_2 eq	0.389	0.085	0.011	0.001	0.006	0.003	0.270	0.011	0.001
Freshwater eutrophication	kg P eq	0.045	0.001	0.001	0.000	0.001	0.000	0.028	0.014	0.000
Marine eutrophication	kg N eq	0.005	0.000	0.000	0.000	0.001	0.000	0.001	0.002	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	149.413	31.860	28.278	0.093	2.954	28.702	52.178	5.150	0.198
Freshwater ecotoxicity	kg 1,4-DCB	3.166	0.212	0.330	0.001	0.068	0.053	1.045	1.450	0.008
Marine ecotoxicity	kg 1,4-DCB	4.257	0.293	0.429	0.001	0.089	0.086	1.450	1.899	0.010
Human carcinogenic toxicity	kg 1,4-DCB	7.894	0.468	0.296	0.001	0.263	0.339	5.256	1.243	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	92.330	5.525	5.792	0.048	1.643	1.650	45.644	31.871	0.158
Land use	m^2a crop eq	1.199	0.055	0.095	0.001	0.035	0.083	0.903	0.021	0.007
Mineral resource scarcity	kg Cu eq	0.087	0.013	0.025	0.000	0.005	0.005	0.029	0.010	0.000
Fossil resource scarcity	kg oil eq	17.654	0.310	0.563	0.164	0.791	0.597	14.704	0.421	0.105
Water consumption	m^3	0.885	0.180	0.048	0.489	0.019	0.003	0.128	0.013	0.004

Table S16: Environmental impacts of **PAC 17 SS** for 1g of PFAS removed. **(Incineration scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO_2 eq	1965.400	29.496	63.612	54.680	52.834	53.015	1586.406	116.591	8.767
Stratospheric ozone depletion	kg CFC_{11} eq	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000
Ionizing radiation	kBq Co-60 eq	68.064	3.279	5.255	0.155	1.308	0.771	55.469	0.652	1.174
Ozone formation, Human health	kg NO_x eq	5.070	0.090	0.185	0.029	0.091	0.159	3.785	0.717	0.014
Fine particulate matter formation	kg PM2.5 eq	4.028	0.704	0.160	0.013	0.057	0.046	2.935	0.106	0.007
Ozone formation, Terrestrial ecosystems	kg NO_x eq	5.174	0.094	0.187	0.030	0.100	0.171	3.856	0.721	0.014
Terrestrial acidification	kg SO_2 eq	10.914	2.383	0.304	0.038	0.177	0.098	7.587	0.308	0.019
Freshwater eutrophication	kg P eq	1.264	0.015	0.036	0.000	0.017	0.005	0.792	0.398	0.002
Marine eutrophication	kg N eq	0.129	0.001	0.003	0.000	0.033	0.001	0.041	0.050	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	4197.022	894.955	794.343	2.621	82.975	806.231	1465.667	144.657	5.573
Freshwater ecotoxicity	kg 1,4-DCB	88.931	5.956	9.267	0.015	1.906	1.475	29.362	40.721	0.228
Marine ecotoxicity	kg 1,4-DCB	119.579	8.222	12.058	0.025	2.504	2.402	40.726	53.347	0.295
Human carcinogenic toxicity	kg 1,4-DCB	221.748	13.135	8.324	0.023	7.390	9.524	147.651	34.928	0.773
Human non-carcinogenic toxicity	kg 1,4-DCB	2593.539	155.184	162.692	1.340	46.155	46.358	1282.136	895.244	4.430
Land use	m^2a crop eq	33.686	1.536	2.671	0.027	0.985	2.321	25.353	0.584	0.210
Mineral resource scarcity	kg Cu eq	2.442	0.364	0.702	0.003	0.141	0.138	0.808	0.274	0.012
Fossil resource scarcity	kg oil eq	495.891	8.708	15.807	4.614	22.209	16.777	413.024	11.815	2.936
Water consumption	m^3	24.873	5.070	1.344	13.744	0.525	0.092	3.608	0.372	0.118

Table S17: Environmental impacts of **PAC 33 SS** for $1m^3$ of leachate entering the process. **(Incineration scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO_2 eq	127.590	1.050	2.265	1.729	1.881	2.937	109.630	7.787	0.312
Stratospheric ozone depletion	kg CFC_{11} eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	4.317	0.117	0.187	0.005	0.047	0.043	3.833	0.044	0.042
Ozone formation, Human health	kg NO_x eq	0.333	0.003	0.007	0.001	0.003	0.009	0.262	0.048	0.000
Fine particulate matter formation	kg PM2.5 eq	0.246	0.025	0.006	0.000	0.002	0.003	0.203	0.007	0.000
Ozone formation, Terrestrial ecosystems	kg NO_x eq	0.339	0.003	0.007	0.001	0.004	0.009	0.266	0.048	0.001
Terrestrial acidification	kg SO_2 eq	0.654	0.085	0.011	0.001	0.006	0.005	0.524	0.021	0.001
Freshwater eutrophication	kg P eq	0.084	0.001	0.001	0.000	0.001	0.000	0.055	0.027	0.000
Marine eutrophication	kg N eq	0.008	0.000	0.000	0.000	0.001	0.000	0.003	0.003	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	218.985	31.860	28.278	0.083	2.954	44.664	101.286	9.662	0.198
Freshwater ecotoxicity	kg 1,4-DCB	5.449	0.212	0.330	0.000	0.068	0.082	2.029	2.720	0.008
Marine ecotoxicity	kg 1,4-DCB	7.333	0.293	0.429	0.001	0.089	0.133	2.814	3.563	0.010
Human carcinogenic toxicity	kg 1,4-DCB	14.119	0.468	0.296	0.001	0.263	0.528	10.203	2.333	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	164.123	5.525	5.792	0.042	1.643	2.568	88.603	59.793	0.158
Land use	m^2a crop eq	2.113	0.055	0.095	0.001	0.035	0.129	1.752	0.039	0.007
Mineral resource scarcity	kg Cu eq	0.125	0.013	0.025	0.000	0.005	0.008	0.056	0.018	0.000
Fossil resource scarcity	kg oil eq	32.175	0.310	0.563	0.146	0.791	0.929	28.542	0.789	0.105
Water consumption	m^3	0.965	0.180	0.048	0.435	0.019	0.005	0.249	0.025	0.004

Table S18: Environmental impacts of **PAC 33 SS** for 1g of PFAS removed. **(Incineration scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO_2 eq	3346.682	27.543	59.400	45.346	49.335	77.036	2875.583	204.253	8.186
Stratospheric ozone depletion	kg CFC_{11} eq	0.005	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.000
Ionizing radiation	kBq Co-60 eq	113.224	3.062	4.907	0.129	1.221	1.120	100.546	1.143	1.097
Ozone formation, Human health	kg NO_x eq	8.727	0.084	0.173	0.024	0.085	0.232	6.861	1.256	0.013
Fine particulate matter formation	kg PM2.5 eq	6.450	0.658	0.149	0.011	0.053	0.067	5.320	0.185	0.007
Ozone formation, Terrestrial ecosystems	kg NO_x eq	8.895	0.088	0.175	0.025	0.093	0.248	6.989	1.264	0.014
Terrestrial acidification	kg SO_2 eq	17.158	2.225	0.284	0.031	0.165	0.142	13.753	0.539	0.018
Freshwater eutrophication	kg P eq	2.204	0.014	0.034	0.000	0.015	0.007	1.435	0.697	0.002
Marine eutrophication	kg N eq	0.198	0.001	0.003	0.000	0.031	0.001	0.075	0.087	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	5743.971	835.695	741.745	2.173	77.480	1171.524	2656.727	253.422	5.204
Freshwater ecotoxicity	kg 1,4-DCB	142.925	5.562	8.653	0.013	1.780	2.143	53.222	71.339	0.213
Marine ecotoxicity	kg 1,4-DCB	192.341	7.678	11.260	0.020	2.338	3.491	73.821	93.458	0.275
Human carcinogenic toxicity	kg 1,4-DCB	370.347	12.265	7.773	0.019	6.901	13.839	267.638	61.190	0.722
Human non-carcinogenic toxicity	kg 1,4-DCB	4304.946	144.908	151.919	1.111	43.099	67.362	2324.051	1568.359	4.137
Land use	m^2a crop eq	55.417	1.434	2.494	0.022	0.920	3.373	45.955	1.023	0.196
Mineral resource scarcity	kg Cu eq	3.286	0.340	0.655	0.003	0.132	0.201	1.465	0.480	0.011
Fossil resource scarcity	kg oil eq	843.940	8.132	14.760	3.826	20.739	24.379	748.664	20.699	2.741
Water consumption	m^3	25.313	4.734	1.255	11.398	0.490	0.133	6.540	0.651	0.110

Table S19: Environmental impacts of **PAC 3.3 DS** for 1m^3 of leachate entering the process. **(Incineration scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Virgin activated carbon, granular**	**Recovered activated carbon, granular**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO_2 eq	13.520	1.050	2.265	2.477	1.881	1.020	1.122	2.437	0.955	0.312
Stratospheric ozone depletion	kg CFC_{11} eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	0.834	0.117	0.187	0.007	0.047	0.015	0.040	0.374	0.005	0.042
Ozone formation, Human health	kg NO_x eq	0.031	0.003	0.007	0.001	0.003	0.003	0.003	0.005	0.006	0.000
Fine particulate matter formation	kg PM2.5 eq	0.040	0.025	0.006	0.001	0.002	0.001	0.002	0.003	0.001	0.000
Ozone formation, Terrestrial ecosystems	kg NO_x eq	0.032	0.003	0.007	0.001	0.004	0.003	0.003	0.005	0.006	0.001
Terrestrial acidification	kg SO_2 eq	0.122	0.085	0.011	0.002	0.006	0.002	0.005	0.008	0.003	0.001
Freshwater eutrophication	kg P eq	0.007	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.003	0.000
Marine eutrophication	kg N eq	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	84.024	31.860	28.278	0.119	2.954	15.518	1.138	2.773	1.185	0.198
Freshwater ecotoxicity	kg 1,4-DCB	1.036	0.212	0.330	0.001	0.068	0.028	0.018	0.038	0.334	0.008
Marine ecotoxicity	kg 1,4-DCB	1.382	0.293	0.429	0.001	0.089	0.046	0.025	0.051	0.437	0.010
Human carcinogenic toxicity	kg 1,4-DCB	1.744	0.468	0.296	0.001	0.263	0.183	0.040	0.178	0.286	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	23.432	5.525	5.792	0.061	1.643	0.892	0.787	1.242	7.333	0.158
Land use	m^2a crop eq	0.288	0.055	0.095	0.001	0.035	0.045	0.014	0.031	0.005	0.007
Mineral resource scarcity	kg Cu eq	0.051	0.013	0.025	0.000	0.005	0.003	0.001	0.002	0.002	0.000
Fossil resource scarcity	kg oil eq	3.202	0.310	0.563	0.209	0.791	0.323	0.282	0.523	0.097	0.105
Water consumption	m^3	0.893	0.180	0.048	0.623	0.019	0.002	0.003	0.012	0.003	0.004

Table S20: Environmental impacts of **PAC 3.3 DS** for 1g of PFAS removed. **(Incineration scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	Ca(OH)$_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO$_2$ eq	815.519	63.339	136.600	149.442	113.454	61.553	67.676	147.024	57.606	18.825
Stratospheric ozone depletion	kg CFC$_{11}$ eq	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Ionizing radiation	kBq Co-60 eq	50.283	7.042	11.284	0.425	2.808	0.895	2.425	22.560	0.322	2.522
Ozone formation, Human health	kg NO$_x$ eq	1.868	0.192	0.397	0.080	0.195	0.185	0.160	0.276	0.354	0.029
Fine particulate matter formation	kg PM2.5 eq	2.437	1.513	0.343	0.035	0.123	0.053	0.121	0.180	0.052	0.016
Ozone formation, Terrestrial ecosystems	kg NO$_x$ eq	1.934	0.202	0.402	0.082	0.215	0.198	0.163	0.285	0.356	0.031
Terrestrial acidification	kg SO$_2$ eq	7.388	5.117	0.653	0.104	0.380	0.114	0.318	0.510	0.152	0.041
Freshwater eutrophication	kg P eq	0.422	0.032	0.077	0.000	0.035	0.005	0.027	0.043	0.197	0.004
Marine eutrophication	kg N eq	0.111	0.002	0.006	0.000	0.072	0.001	0.002	0.003	0.025	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	5068.302	1921.812	1705.759	7.163	178.178	936.072	68.621	167.256	71.473	11.968
Freshwater ecotoxicity	kg 1,4-DCB	62.511	12.790	19.900	0.042	4.094	1.713	1.092	2.270	20.120	0.490
Marine ecotoxicity	kg 1,4-DCB	83.388	17.657	25.893	0.067	5.377	2.789	1.510	3.104	26.358	0.633
Human carcinogenic toxicity	kg 1,4-DCB	105.177	28.205	17.874	0.064	15.870	11.058	2.440	10.748	17.258	1.660
Human non-carcinogenic toxicity	kg 1,4-DCB	1413.424	333.238	349.362	3.661	99.113	53.823	47.482	74.901	442.330	9.514
Land use	m^{2}a crop eq	17.350	3.298	5.736	0.073	2.115	2.695	0.837	1.857	0.289	0.451
Mineral resource scarcity	kg Cu eq	3.078	0.781	1.507	0.008	0.304	0.160	0.033	0.123	0.135	0.026
Fossil resource scarcity	kg oil eq	193.136	18.700	33.944	12.609	47.692	19.479	17.008	31.562	5.838	6.304
Water consumption	m^3	53.859	10.887	2.886	37.563	1.128	0.107	0.152	0.699	0.184	0.254

Table S21: Environmental impacts of **PAC 5 DS** for 1m^3 of leachate entering the process. **(Incineration scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	Ca(OH)$_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO$_2$ eq	15.387	1.050	2.265	2.477	1.881	1.053	1.700	3.693	0.955	0.312
Stratospheric ozone depletion	kg CFC$_{11}$ eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.047	0.117	0.187	0.007	0.047	0.015	0.061	0.567	0.005	0.042
Ozone formation, Human health	kg NO$_x$ eq	0.035	0.003	0.007	0.001	0.003	0.003	0.004	0.007	0.006	0.000
Fine particulate matter formation	kg PM2.5 eq	0.043	0.025	0.006	0.001	0.002	0.001	0.003	0.005	0.001	0.000
Ozone formation, Terrestrial ecosystems	kg NO$_x$ eq	0.036	0.003	0.007	0.001	0.004	0.003	0.004	0.007	0.006	0.001
Terrestrial acidification	kg SO$_2$ eq	0.130	0.085	0.011	0.002	0.006	0.002	0.008	0.013	0.003	0.001
Freshwater eutrophication	kg P eq	0.008	0.001	0.001	0.000	0.001	0.000	0.001	0.001	0.003	0.000
Marine eutrophication	kg N eq	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	86.541	31.860	28.278	0.119	2.954	16.021	1.724	4.201	1.185	0.198
Freshwater ecotoxicity	kg 1,4-DCB	1.066	0.212	0.330	0.001	0.068	0.029	0.027	0.057	0.334	0.008
Marine ecotoxicity	kg 1,4-DCB	1.423	0.293	0.429	0.001	0.089	0.048	0.038	0.078	0.437	0.010
Human carcinogenic toxicity	kg 1,4-DCB	1.862	0.468	0.296	0.001	0.263	0.189	0.061	0.270	0.286	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	24.506	5.525	5.792	0.061	1.643	0.921	1.193	1.881	7.333	0.158
Land use	m^{2}a crop eq	0.312	0.055	0.095	0.001	0.035	0.046	0.021	0.047	0.005	0.007
Mineral resource scarcity	kg Cu eq	0.052	0.013	0.025	0.000	0.005	0.003	0.001	0.003	0.002	0.000
Fossil resource scarcity	kg oil eq	3.627	0.310	0.563	0.209	0.791	0.333	0.427	0.793	0.097	0.105
Water consumption	m^3	0.900	0.180	0.048	0.623	0.019	0.002	0.004	0.018	0.003	0.004

Table S22: Environmental impacts of **PAC 5 DS** for 1g of PFAS removed. **(Incineration scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**Ca(OH)$_2$**	**Polyelectrolyte**	**Transport**	**Virgin activated carbon, granular**	**Recovered activated carbon, granular**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO$_2$ eq	766.864	52.334	112.867	123.478	93.743	52.506	84.724	184.061	47.598	15.555
Stratospheric ozone depletion	kg CFC$_{11}$ eq	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Ionizing radiation	kBq Co-60 eq	52.205	5.818	9.324	0.351	2.320	0.764	3.036	28.243	0.266	2.083
Ozone formation, Human health	kg NO$_x$ eq	1.734	0.159	0.328	0.066	0.161	0.158	0.200	0.345	0.293	0.024
Fine particulate matter formation	kg PM2.5 eq	2.143	1.250	0.283	0.029	0.102	0.046	0.152	0.226	0.043	0.013
Ozone formation, Terrestrial ecosystems	kg NO$_x$ eq	1.794	0.167	0.332	0.068	0.178	0.169	0.204	0.356	0.294	0.026
Terrestrial acidification	kg SO$_2$ eq	6.460	4.228	0.539	0.086	0.314	0.097	0.398	0.638	0.126	0.033
Freshwater eutrophication	kg P eq	0.378	0.026	0.064	0.000	0.029	0.005	0.034	0.054	0.162	0.004
Marine eutrophication	kg N eq	0.093	0.002	0.005	0.000	0.059	0.001	0.002	0.004	0.020	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	4313.180	1587.916	1409.400	5.918	147.222	798.483	85.907	209.389	59.056	9.889
Freshwater ecotoxicity	kg 1,4-DCB	53.127	10.568	16.443	0.035	3.382	1.461	1.368	2.842	16.624	0.405
Marine ecotoxicity	kg 1,4-DCB	70.939	14.589	21.394	0.055	4.442	2.379	1.890	3.886	21.779	0.523
Human carcinogenic toxicity	kg 1,4-DCB	92.813	23.305	14.769	0.053	13.113	9.433	3.055	13.455	14.259	1.371
Human non-carcinogenic toxicity	kg 1,4-DCB	1221.388	275.342	288.664	3.025	81.893	45.912	59.443	93.769	365.479	7.861
Land use	m^{2}a crop eq	15.555	2.725	4.739	0.060	1.748	2.299	1.048	2.325	0.238	0.372
Mineral resource scarcity	kg Cu eq	2.614	0.645	1.245	0.007	0.251	0.137	0.042	0.154	0.112	0.021
Fossil resource scarcity	kg oil eq	180.776	15.451	28.047	10.418	39.406	16.616	21.293	39.513	4.824	5.208
Water consumption	m^3	44.867	8.996	2.384	31.037	0.932	0.091	0.190	0.876	0.152	0.210

Table S23: Environmental impacts of **PAC 7.3 DS** for 1m^3 of leachate entering the process. **(Incineration scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Virgin activated carbon, granular**	**Recovered activated carbon, granular**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO_2 eq	17.912	1.050	2.265	2.477	1.881	1.098	2.482	5.392	0.955	0.312
Stratospheric ozone depletion	kg CFC_{11} eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.337	0.117	0.187	0.007	0.047	0.016	0.089	0.827	0.005	0.042
Ozone formation, Human health	kg NO_x eq	0.040	0.003	0.007	0.001	0.003	0.003	0.006	0.010	0.006	0.000
Fine particulate matter formation	kg PM2.5 eq	0.047	0.025	0.006	0.001	0.002	0.001	0.004	0.007	0.001	0.000
Ozone formation, Terrestrial ecosystems	kg NO_x eq	0.041	0.003	0.007	0.001	0.004	0.004	0.006	0.010	0.006	0.001
Terrestrial acidification	kg SO_2 eq	0.139	0.085	0.011	0.002	0.006	0.002	0.012	0.019	0.003	0.001
Freshwater eutrophication	kg P eq	0.008	0.001	0.001	0.000	0.001	0.000	0.001	0.002	0.003	0.000
Marine eutrophication	kg N eq	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	89.946	31.860	28.278	0.119	2.954	16.701	2.517	6.134	1.185	0.198
Freshwater ecotoxicity	kg 1,4-DCB	1.106	0.212	0.330	0.001	0.068	0.031	0.040	0.083	0.334	0.008
Marine ecotoxicity	kg 1,4-DCB	1.479	0.293	0.429	0.001	0.089	0.050	0.055	0.114	0.437	0.010
Human carcinogenic toxicity	kg 1,4-DCB	2.023	0.468	0.296	0.001	0.263	0.197	0.089	0.394	0.286	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	25.959	5.525	5.792	0.061	1.643	0.960	1.741	2.747	7.333	0.158
Land use	m^2a crop eq	0.345	0.055	0.095	0.001	0.035	0.048	0.031	0.068	0.005	0.007
Mineral resource scarcity	kg Cu eq	0.054	0.013	0.025	0.000	0.005	0.003	0.001	0.005	0.002	0.000
Fossil resource scarcity	kg oil eq	4.202	0.310	0.563	0.209	0.791	0.348	0.624	1.157	0.097	0.105
Water consumption	m^3	0.910	0.180	0.048	0.623	0.019	0.002	0.006	0.026	0.003	0.004

Table S24: Environmental impacts of **PAC 7.3 DS** for 1g of PFAS removed. **(Incineration scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO_2 eq	668.117	39.167	84.469	92.410	70.157	40.963	92.574	201.116	35.622	11.641
Stratospheric ozone depletion	kg CFC_{11} eq	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Ionizing radiation	kBq Co-60 eq	49.863	4.354	6.978	0.263	1.737	0.596	3.317	30.860	0.199	1.559
Ozone formation, Human health	kg NO_x eq	1.490	0.119	0.246	0.050	0.121	0.123	0.218	0.377	0.219	0.018
Fine particulate matter formation	kg PM2.5 eq	1.735	0.935	0.212	0.022	0.076	0.036	0.166	0.247	0.032	0.010
Ozone formation, Terrestrial ecosystems	kg NO_x eq	1.540	0.125	0.249	0.051	0.133	0.132	0.223	0.390	0.220	0.019
Terrestrial acidification	kg SO_2 eq	5.194	3.164	0.404	0.064	0.235	0.076	0.435	0.697	0.094	0.025
Freshwater eutrophication	kg P eq	0.314	0.020	0.048	0.000	0.022	0.004	0.037	0.059	0.122	0.003
Marine eutrophication	kg N eq	0.072	0.001	0.004	0.000	0.044	0.000	0.002	0.004	0.015	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	3354.980	1188.388	1054.788	4.429	110.180	622.939	93.867	228.791	44.197	7.401
Freshwater ecotoxicity	kg 1,4-DCB	41.255	7.909	12.306	0.026	2.531	1.140	1.494	3.105	12.442	0.303
Marine ecotoxicity	kg 1,4-DCB	55.154	10.918	16.012	0.041	3.325	1.856	2.065	4.246	16.299	0.391
Human carcinogenic toxicity	kg 1,4-DCB	75.444	17.441	11.053	0.040	9.814	7.359	3.338	14.702	10.672	1.026
Human non-carcinogenic toxicity	kg 1,4-DCB	968.283	206.064	216.035	2.264	61.288	35.818	64.951	102.457	273.523	5.883
Land use	m^2a crop eq	12.876	2.039	3.547	0.045	1.308	1.793	1.145	2.541	0.178	0.279
Mineral resource scarcity	kg Cu eq	2.028	0.483	0.932	0.005	0.188	0.107	0.046	0.169	0.084	0.016
Fossil resource scarcity	kg oil eq	156.753	11.564	20.990	7.797	29.491	12.963	23.266	43.174	3.610	3.898
Water consumption	m^3	33.948	6.732	1.784	23.228	0.697	0.071	0.208	0.957	0.114	0.157

Table S25: Environmental impacts of **PAC 8.7 DS** for 1m^3 of leachate entering the process. **(Incineration scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Virgin activated carbon, granular**	**Recovered activated carbon, granular**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO_2 eq	19.382	1.050	2.265	2.477	1.881	1.125	2.890	6.426	0.955	0.312
Stratospheric ozone depletion	kg CFC_{11} eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.508	0.117	0.187	0.007	0.047	0.016	0.101	0.986	0.005	0.042
Ozone formation, Human health	kg NO_x eq	0.043	0.003	0.007	0.001	0.003	0.003	0.007	0.012	0.006	0.000
Fine particulate matter formation	kg PM2.5 eq	0.049	0.025	0.006	0.001	0.002	0.001	0.005	0.008	0.001	0.000
Ozone formation, Terrestrial ecosystems	kg NO_x eq	0.044	0.003	0.007	0.001	0.004	0.004	0.007	0.012	0.006	0.001
Terrestrial acidification	kg SO_2 eq	0.145	0.085	0.011	0.002	0.006	0.002	0.014	0.022	0.003	0.001
Freshwater eutrophication	kg P eq	0.009	0.001	0.001	0.000	0.001	0.000	0.001	0.002	0.003	0.000
Marine eutrophication	kg N eq	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	91.690	31.860	28.278	0.119	2.954	17.115	2.670	7.310	1.185	0.198
Freshwater ecotoxicity	kg 1,4-DCB	1.136	0.212	0.330	0.001	0.068	0.031	0.053	0.099	0.334	0.008
Marine ecotoxicity	kg 1,4-DCB	1.521	0.293	0.429	0.001	0.089	0.051	0.074	0.136	0.437	0.010
Human carcinogenic toxicity	kg 1,4-DCB	2.283	0.468	0.296	0.001	0.263	0.202	0.269	0.470	0.286	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	27.105	5.525	5.792	0.061	1.643	0.984	2.336	3.274	7.333	0.158
Land use	m^2a crop eq	0.375	0.055	0.095	0.001	0.035	0.049	0.046	0.081	0.005	0.007
Mineral resource scarcity	kg Cu eq	0.056	0.013	0.025	0.000	0.005	0.003	0.001	0.005	0.002	0.000
Fossil resource scarcity	kg oil eq	4.562	0.310	0.563	0.209	0.791	0.356	0.752	1.379	0.097	0.105
Water consumption	m^3	0.916	0.180	0.048	0.623	0.019	0.002	0.007	0.031	0.003	0.004

Table S26: Environmental impacts of **PAC 8.7 DS** for 1g of PFAS removed. **(Incineration scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO_2 eq	614.591	33.297	71.810	78.561	59.642	35.687	91.649	203.765	30.283	9.896
Stratospheric ozone depletion	kg CFC_{11} eq	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000
Ionizing radiation	kBq Co-60 eq	47.819	3.702	5.932	0.223	1.476	0.519	3.205	31.267	0.169	1.326
Ozone formation, Human health	kg NO_x eq	1.364	0.101	0.209	0.042	0.103	0.107	0.219	0.382	0.186	0.015
Fine particulate matter formation	kg PM2.5 eq	1.545	0.795	0.180	0.018	0.065	0.031	0.170	0.250	0.027	0.008
Ozone formation, Terrestrial ecosystems	kg NO_x eq	1.409	0.106	0.212	0.043	0.113	0.115	0.223	0.395	0.187	0.016
Terrestrial acidification	kg SO_2 eq	4.599	2.690	0.343	0.055	0.200	0.066	0.438	0.706	0.080	0.021
Freshwater eutrophication	kg P eq	0.291	0.017	0.041	0.000	0.019	0.003	0.046	0.060	0.103	0.002
Marine eutrophication	kg N eq	0.062	0.001	0.003	0.000	0.038	0.000	0.002	0.004	0.013	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	2907.481	1010.289	896.711	3.765	93.668	542.704	84.674	231.805	37.573	6.292
Freshwater ecotoxicity	kg 1,4-DCB	36.029	6.724	10.461	0.022	2.152	0.993	1.696	3.146	10.577	0.258
Marine ecotoxicity	kg 1,4-DCB	48.217	9.282	13.612	0.035	2.826	1.617	2.353	4.302	13.856	0.333
Human carcinogenic toxicity	kg 1,4-DCB	72.382	14.827	9.396	0.034	8.343	6.411	8.530	14.896	9.072	0.872
Human non-carcinogenic toxicity	kg 1,4-DCB	859.484	175.182	183.658	1.925	52.103	31.205	74.071	103.807	232.531	5.001
Land use	m^2a crop eq	11.889	1.734	3.015	0.038	1.112	1.562	1.465	2.574	0.152	0.237
Mineral resource scarcity	kg Cu eq	1.762	0.411	0.792	0.004	0.160	0.093	0.047	0.171	0.071	0.014
Fossil resource scarcity	kg oil eq	144.655	9.831	17.844	6.629	25.071	11.293	23.861	43.743	3.069	3.314
Water consumption	m^3	29.050	5.724	1.517	19.747	0.593	0.062	0.208	0.969	0.097	0.133

Table S27: Environmental impacts of **FENTON** for 1m^3 of leachate entering the process. **(Incineration scenario).**

Impact category	Unit	Total	$Ca(OH)_2$	Polyelectrolyte	Transport	Hydrogen Peroxide	Cloruro ferroso 9%	Sewage sludge incineration	Electricity, medium voltage {IT}
Global warming	kg CO_2 eq	47.030	16.195	11.285	6.090	4.860	2.815	5.455	0.331
Stratospheric ozone depletion	kg CFC_{11} eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.193	0.047	0.279	0.089	0.419	0.284	0.031	0.044
Ozone formation, Human health	kg NO_x eq	0.096	0.009	0.019	0.018	0.006	0.009	0.034	0.001
Fine particulate matter formation	kg PM2.5 eq	0.037	0.004	0.012	0.005	0.003	0.007	0.005	0.000
Ozone formation, Terrestrial ecosystems	kg NO_x eq	0.101	0.009	0.021	0.020	0.007	0.010	0.034	0.001
Terrestrial acidification	kg SO_2 eq	0.097	0.011	0.038	0.011	0.008	0.014	0.014	0.001
Freshwater eutrophication	kg P eq	0.026	0.000	0.004	0.001	0.001	0.002	0.019	0.000
Marine eutrophication	kg N eq	0.010	0.000	0.007	0.000	0.000	0.000	0.002	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	141.302	0.647	17.723	92.608	7.492	15.854	6.768	0.210
Freshwater ecotoxicity	kg 1,4-DCB	3.568	0.005	0.407	0.169	0.587	0.486	1.905	0.009
Marine ecotoxicity	kg 1,4-DCB	4.696	0.008	0.535	0.276	0.746	0.625	2.496	0.011
Human carcinogenic toxicity	kg 1,4-DCB	7.578	0.017	1.579	1.094	1.916	1.309	1.634	0.029
Human non-carcinogenic toxicity	kg 1,4-DCB	75.340	0.428	9.859	5.325	7.665	10.013	41.883	0.167
Land use	m^2a crop eq	0.730	0.008	0.210	0.267	0.073	0.137	0.027	0.008
Mineral resource scarcity	kg Cu eq	0.108	0.001	0.030	0.016	0.015	0.033	0.013	0.000
Fossil resource scarcity	kg oil eq	11.220	1.488	4.744	1.927	1.665	0.732	0.553	0.111
Water consumption	m^3	0.773	0.288	0.112	0.011	0.205	0.135	0.017	0.004

Table S28: Environmental impacts of **FENTON** for 1g of PFAS removed. **(Incineration scenario).**

Impact category	**Unit**	**Total**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Hydrogen Peroxide**	**Cloruro ferroso 9%**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO_2 eq	2197.234	756.640	527.246	284.508	227.038	131.516	254.837	15.448
Stratospheric ozone depletion	kg CFC_{11} eq	0.006	0.000	0.000	0.000	0.000	0.000	0.005	0.000
Ionizing radiation	kBq Co-60 eq	55.718	2.179	13.051	4.138	19.591	13.265	1.425	2.069
Ozone formation, Human health	kg NO_x eq	4.487	0.405	0.906	0.855	0.287	0.442	1.567	0.024
Fine particulate matter formation	kg PM2.5 eq	1.707	0.177	0.571	0.247	0.141	0.326	0.231	0.013
Ozone formation, Terrestrial ecosystems	kg NO_x eq	4.701	0.414	0.999	0.916	0.318	0.453	1.577	0.025
Terrestrial acidification	kg SO_2 eq	4.539	0.524	1.765	0.526	0.372	0.646	0.673	0.033
Freshwater eutrophication	kg P eq	1.221	0.002	0.165	0.024	0.063	0.095	0.869	0.004
Marine eutrophication	kg N eq	0.466	0.001	0.334	0.003	0.015	0.004	0.109	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	6601.623	30.220	828.033	4326.649	350.008	740.708	316.184	9.821
Freshwater ecotoxicity	kg 1,4-DCB	166.694	0.255	19.024	7.915	27.408	22.683	89.006	0.402
Marine ecotoxicity	kg 1,4-DCB	219.415	0.391	24.986	12.892	34.841	29.183	116.604	0.519
Human carcinogenic toxicity	kg 1,4-DCB	354.052	0.817	73.751	51.111	89.513	61.153	76.344	1.362
Human non-carcinogenic toxicity	kg 1,4-DCB	3519.877	19.996	460.600	248.778	358.094	467.827	1956.774	7.807
Land use	m^2a crop eq	34.126	0.381	9.830	12.457	3.431	6.381	1.277	0.370
Mineral resource scarcity	kg Cu eq	5.035	0.043	1.412	0.742	0.688	1.531	0.599	0.021
Fossil resource scarcity	kg oil eq	524.207	69.530	221.635	90.035	77.801	34.208	25.825	5.173
Water consumption	m^3	36.105	13.434	5.240	0.493	9.588	6.329	0.813	0.208

Table S29: Environmental impacts of **CLARIFLOCCULATION** for 1m^3 of leachate entering the process. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	Ca(OH)$_2$	Polyelectrolyte	Transport	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	14.824	1.038	2.265	2.477	1.696	0.947	6.089	0.312
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	0.408	0.121	0.187	0.007	0.034	0.015	0.002	0.042
Ozone formation, Human health	kg NOx eq	0.018	0.003	0.007	0.001	0.003	0.003	0.001	0.000
Fine particulate matter formation	kg PM2.5 eq	0.036	0.026	0.006	0.001	0.002	0.001	0.000	0.000
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.019	0.003	0.007	0.001	0.003	0.003	0.001	0.001
Terrestrial acidification	kg SO2 eq	0.110	0.087	0.011	0.002	0.006	0.002	0.001	0.001
Freshwater eutrophication	kg P eq	0.010	0.000	0.001	0.000	0.001	0.000	0.007	0.000
Marine eutrophication	kg N eq	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	88.319	39.959	28.278	0.119	4.563	14.866	0.336	0.198
Freshwater ecotoxicity	kg 1,4-DCB	1.143	0.178	0.330	0.001	0.048	0.023	0.556	0.008
Marine ecotoxicity	kg 1,4-DCB	1.550	0.252	0.429	0.001	0.063	0.039	0.755	0.010
Human carcinogenic toxicity	kg 1,4-DCB	0.581	0.138	0.296	0.001	0.060	0.047	0.010	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	28.506	4.551	5.792	0.061	0.975	0.737	16.232	0.158
Land use	m2a crop eq	0.217	0.045	0.095	0.001	0.020	0.038	0.011	0.007
Mineral resource scarcity	kg Cu eq	0.045	0.013	0.025	0.000	0.004	0.002	0.000	0.000
Fossil resource scarcity	kg oil eq	2.266	0.292	0.563	0.209	0.744	0.299	0.055	0.105
Water consumption	m3	0.880	0.181	0.048	0.623	0.019	0.002	0.003	0.004

Table S30: Environmental impacts of **CLARIFLOCCULATION** for 1g of PFAS removed. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	2066.639	144.715	315.705	345.386	236.506	131.981	848.837	43.509
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	56.894	16.918	26.079	0.981	4.764	2.110	0.214	5.828
Ozone formation, Human health	kg NOx eq	2.538	0.448	0.918	0.185	0.399	0.399	0.122	0.067
Fine particulate matter formation	kg PM2.5 eq	4.950	3.591	0.792	0.081	0.268	0.116	0.065	0.037
Ozone formation, Terrestrial ecosystems	kg NOx eq	2.637	0.469	0.930	0.189	0.423	0.426	0.127	0.072
Terrestrial acidification	kg SO2 eq	15.332	12.166	1.508	0.240	0.905	0.248	0.171	0.094
Freshwater eutrophication	kg P eq	1.345	0.061	0.178	0.001	0.072	0.010	1.013	0.010
Marine eutrophication	kg N eq	0.190	0.005	0.014	0.000	0.165	0.004	0.001	0.001
Terrestrial ecotoxicity	kg 1,4-DCB	12312.577	5570.624	3942.304	16.555	636.156	2072.476	46.801	27.661
Freshwater ecotoxicity	kg 1,4-DCB	159.412	24.772	45.992	0.098	6.639	3.211	77.567	1.132
Marine ecotoxicity	kg 1,4-DCB	216.077	35.136	59.844	0.155	8.767	5.411	105.301	1.463
Human carcinogenic toxicity	kg 1,4-DCB	80.929	19.250	41.311	0.148	8.420	6.561	1.404	3.836
Human non-carcinogenic toxicity	kg 1,4-DCB	3973.968	634.448	807.436	8.461	135.984	102.785	2262.865	21.988
Land use	m2a crop eq	30.226	6.254	13.256	0.168	2.764	5.246	1.496	1.041
Mineral resource scarcity	kg Cu eq	6.261	1.779	3.483	0.019	0.544	0.343	0.034	0.060
Fossil resource scarcity	kg oil eq	315.888	40.756	78.451	29.142	103.654	41.620	7.697	14.569
Water consumption	m3	122.647	25.247	6.669	86.815	2.710	0.261	0.358	0.586

Table S31: Environmental impacts of **PAC 7.3 SS** for $1m^3$ of leachate entering the process. **(Landfilling scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Activated carbon, granular**	**Sewage sludge, sanitary landfill**	**Electricity, medium voltage {IT}**
Global warming	kg CO2 eq	45.341	1.050	2.265	2.150	1.881	1.254	24.251	12.178	0.312
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.268	0.117	0.187	0.006	0.047	0.018	0.848	0.003	0.042
Ozone formation, Human health	kg NOx eq	0.078	0.003	0.007	0.001	0.003	0.004	0.058	0.002	0.000
Fine particulate matter formation	kg PM2.5 eq	0.080	0.025	0.006	0.001	0.002	0.001	0.045	0.001	0.000
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.080	0.003	0.007	0.001	0.004	0.004	0.059	0.002	0.001
Terrestrial acidification	kg SO2 eq	0.225	0.085	0.011	0.001	0.006	0.002	0.116	0.002	0.001
Freshwater eutrophication	kg P eq	0.029	0.001	0.001	0.000	0.001	0.000	0.012	0.015	0.000
Marine eutrophication	kg N eq	0.002	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	105.520	31.860	28.278	0.086	2.954	19.065	22.406	0.671	0.198
Freshwater ecotoxicity	kg 1,4-DCB	2.215	0.212	0.330	0.001	0.068	0.035	0.449	1.113	0.008
Marine ecotoxicity	kg 1,4-DCB	3.013	0.293	0.429	0.001	0.089	0.057	0.623	1.511	0.010
Human carcinogenic toxicity	kg 1,4-DCB	3.559	0.468	0.296	0.002	0.263	0.225	2.257	0.020	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	66.334	5.525	5.792	0.057	1.643	1.096	19.600	32.463	0.158
Land use	m2a crop eq	0.657	0.055	0.095	0.001	0.035	0.055	0.388	0.021	0.007
Mineral resource scarcity	kg Cu eq	0.060	0.013	0.025	0.000	0.005	0.003	0.012	0.000	0.000
Fossil resource scarcity	kg oil eq	8.787	0.310	0.563	0.198	0.791	0.397	6.314	0.110	0.105
Water consumption	m3	0.352	0.180	0.048	0.038	0.019	0.002	0.055	0.005	0.004

Table S32: Environmental impacts of **PAC 7.3 SS** for 1g of PFAS removed. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	1842.638	42.674	92.033	87.388	76.439	50.950	985.576	494.896	12.683
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	51.516	4.744	7.602	0.252	1.892	0.741	34.461	0.125	1.699
Ozone formation, Human health	kg NOx eq	3.171	0.130	0.268	0.047	0.131	0.153	2.351	0.071	0.020
Fine particulate matter formation	kg PM2.5 eq	3.270	1.019	0.231	0.020	0.083	0.044	1.823	0.038	0.011
Ozone formation, Terrestrial ecosystems	kg NOx eq	3.254	0.136	0.271	0.048	0.145	0.164	2.396	0.074	0.021
Terrestrial acidification	kg SO2 eq	9.139	3.448	0.440	0.061	0.256	0.094	4.714	0.100	0.027
Freshwater eutrophication	kg P eq	1.188	0.022	0.052	0.000	0.024	0.004	0.492	0.591	0.003
Marine eutrophication	kg N eq	0.081	0.001	0.004	0.000	0.048	0.001	0.026	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	4288.313	1294.801	1149.238	3.490	120.046	774.822	910.566	27.286	8.064
Freshwater ecotoxicity	kg 1,4-DCB	90.025	8.617	13.407	0.029	2.758	1.418	18.241	45.224	0.330
Marine ecotoxicity	kg 1,4-DCB	122.438	11.896	17.445	0.045	3.622	2.309	25.301	61.393	0.426
Human carcinogenic toxicity	kg 1,4-DCB	144.652	19.003	12.043	0.094	10.692	9.153	91.730	0.818	1.118
Human non-carcinogenic toxicity	kg 1,4-DCB	2695.802	224.516	235.379	2.309	66.776	44.552	796.545	1319.315	6.410
Land use	m2a crop eq	26.712	2.222	3.864	0.044	1.425	2.231	15.751	0.872	0.304
Mineral resource scarcity	kg Cu eq	2.423	0.526	1.015	0.005	0.205	0.133	0.502	0.020	0.017
Fossil resource scarcity	kg oil eq	357.086	12.599	22.869	8.030	32.132	16.124	256.597	4.488	4.247
Water consumption	m3	14.300	7.335	1.944	1.552	0.760	0.088	2.241	0.208	0.171

Table S33: Environmental impacts of **PAC 17 SS** for 1m^3 of leachate entering the process. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	92.280	1.050	2.265	1.947	1.881	1.887	56.476	26.463	0.312
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	2.407	0.117	0.187	0.006	0.047	0.027	1.975	0.007	0.042
Ozone formation, Human health	kg NOx eq	0.159	0.003	0.007	0.001	0.003	0.006	0.135	0.004	0.000
Fine particulate matter formation	kg PM2.5 eq	0.142	0.025	0.006	0.000	0.002	0.002	0.104	0.002	0.000
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.162	0.003	0.007	0.001	0.004	0.006	0.137	0.004	0.001
Terrestrial acidification	kg SO2 eq	0.383	0.085	0.011	0.001	0.006	0.003	0.270	0.005	0.001
Freshwater eutrophication	kg P eq	0.062	0.001	0.001	0.000	0.001	0.000	0.028	0.032	0.000
Marine eutrophication	kg N eq	0.003	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	145.723	31.860	28.278	0.093	2.954	28.702	52.178	1.459	0.198
Freshwater ecotoxicity	kg 1,4-DCB	4.134	0.212	0.330	0.001	0.068	0.053	1.045	2.418	0.008
Marine ecotoxicity	kg 1,4-DCB	5.641	0.293	0.429	0.001	0.089	0.086	1.450	3.283	0.010
Human carcinogenic toxicity	kg 1,4-DCB	6.695	0.468	0.296	0.001	0.263	0.339	5.256	0.044	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	131.005	5.525	5.792	0.048	1.643	1.650	45.644	70.546	0.158
Land use	m2a crop eq	1.225	0.055	0.095	0.001	0.035	0.083	0.903	0.047	0.007
Mineral resource scarcity	kg Cu eq	0.078	0.013	0.025	0.000	0.005	0.005	0.029	0.001	0.000
Fossil resource scarcity	kg oil eq	17.473	0.310	0.563	0.164	0.791	0.597	14.704	0.240	0.105
Water consumption	m3	0.883	0.180	0.048	0.489	0.019	0.003	0.128	0.011	0.004

Table S34: Environmental impacts of **PAC 17 SS** for 1g of PFAS removed. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	2592.149	29.496	63.612	54.680	52.834	53.015	1586.406	743.339	8.767
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	67.599	3.279	5.255	0.155	1.308	0.771	55.469	0.187	1.174
Ozone formation, Human health	kg NOx eq	4.460	0.090	0.185	0.029	0.091	0.159	3.785	0.107	0.014
Fine particulate matter formation	kg PM2.5 eq	3.979	0.704	0.160	0.013	0.057	0.046	2.935	0.057	0.007
Ozone formation, Terrestrial ecosystems	kg NOx eq	4.564	0.094	0.187	0.030	0.100	0.171	3.856	0.112	0.014
Terrestrial acidification	kg SO2 eq	10.755	2.383	0.304	0.038	0.177	0.098	7.587	0.150	0.019
Freshwater eutrophication	kg P eq	1.753	0.015	0.036	0.000	0.017	0.005	0.792	0.887	0.002
Marine eutrophication	kg N eq	0.080	0.001	0.003	0.000	0.033	0.001	0.041	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	4093.349	894.955	794.343	2.621	82.975	806.231	1465.667	40.984	5.573
Freshwater ecotoxicity	kg 1,4-DCB	116.136	5.956	9.267	0.015	1.906	1.475	29.362	67.927	0.228
Marine ecotoxicity	kg 1,4-DCB	158.445	8.222	12.058	0.025	2.504	2.402	40.726	92.213	0.295
Human carcinogenic toxicity	kg 1,4-DCB	188.049	13.135	8.324	0.023	7.390	9.524	147.651	1.229	0.773
Human non-carcinogenic toxicity	kg 1,4-DCB	3679.920	155.184	162.692	1.340	46.155	46.358	1282.136	1981.626	4.430
Land use	m2a crop eq	34.412	1.536	2.671	0.027	0.985	2.321	25.353	1.310	0.210
Mineral resource scarcity	kg Cu eq	2.198	0.364	0.702	0.003	0.141	0.138	0.808	0.029	0.012
Fossil resource scarcity	kg oil eq	490.816	8.708	15.807	4.614	22.209	16.777	413.024	6.741	2.936
Water consumption	m3	24.814	5.070	1.344	13.744	0.525	0.092	3.608	0.313	0.118

Table S35: Environmental impacts of **PAC 33 SS** for 1m^3 of leachate entering the process. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	169.450	1.050	2.265	1.729	1.881	2.937	109.630	49.647	0.312
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	4.286	0.117	0.187	0.005	0.047	0.043	3.833	0.012	0.042
Ozone formation, Human health	kg NOx eq	0.292	0.003	0.007	0.001	0.003	0.009	0.262	0.007	0.000
Fine particulate matter formation	kg PM2.5 eq	0.243	0.025	0.006	0.000	0.002	0.003	0.203	0.004	0.000
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.298	0.003	0.007	0.001	0.004	0.009	0.266	0.007	0.001
Terrestrial acidification	kg SO2 eq	0.644	0.085	0.011	0.001	0.006	0.005	0.524	0.010	0.001
Freshwater eutrophication	kg P eq	0.117	0.001	0.001	0.000	0.001	0.000	0.055	0.059	0.000
Marine eutrophication	kg N eq	0.004	0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	212.061	31.860	28.278	0.083	2.954	44.664	101.286	2.737	0.198
Freshwater ecotoxicity	kg 1,4-DCB	7.266	0.212	0.330	0.000	0.068	0.082	2.029	4.537	0.008
Marine ecotoxicity	kg 1,4-DCB	9.929	0.293	0.429	0.001	0.089	0.133	2.814	6.159	0.010
Human carcinogenic toxicity	kg 1,4-DCB	11.868	0.468	0.296	0.001	0.263	0.528	10.203	0.082	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	236.681	5.525	5.792	0.042	1.643	2.568	88.603	132.351	0.158
Land use	m2a crop eq	2.161	0.055	0.095	0.001	0.035	0.129	1.752	0.087	0.007
Mineral resource scarcity	kg Cu eq	0.109	0.013	0.025	0.000	0.005	0.008	0.056	0.002	0.000
Fossil resource scarcity	kg oil eq	31.836	0.310	0.563	0.146	0.791	0.929	28.542	0.450	0.105
Water consumption	m3	0.961	0.180	0.048	0.435	0.019	0.005	0.249	0.021	0.004

Table S36: Environmental impacts of **PAC 33 SS** for 1g of PFAS removed. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	4444.669	27.543	59.400	45.346	49.335	77.036	2875.583	1302.240	8.186
Stratospheric ozone depletion	kg CFC11 eq	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
Ionizing radiation	kBq Co-60 eq	112.409	3.062	4.907	0.129	1.221	1.120	100.546	0.328	1.097
Ozone formation, Human health	kg NOx eq	7.658	0.084	0.173	0.024	0.085	0.232	6.861	0.188	0.013
Fine particulate matter formation	kg PM2.5 eq	6.364	0.658	0.149	0.011	0.053	0.067	5.320	0.099	0.007
Ozone formation, Terrestrial ecosystems	kg NOx eq	7.827	0.088	0.175	0.025	0.093	0.248	6.989	0.196	0.014
Terrestrial acidification	kg SO2 eq	16.880	2.225	0.284	0.031	0.165	0.142	13.753	0.262	0.018
Freshwater eutrophication	kg P eq	3.061	0.014	0.034	0.000	0.015	0.007	1.435	1.554	0.002
Marine eutrophication	kg N eq	0.111	0.001	0.003	0.000	0.031	0.001	0.075	0.001	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	5562.348	835.695	741.745	2.173	77.480	1171.524	2656.727	71.800	5.204
Freshwater ecotoxicity	kg 1,4-DCB	190.585	5.562	8.653	0.013	1.780	2.143	53.222	118.999	0.213
Marine ecotoxicity	kg 1,4-DCB	260.429	7.678	11.260	0.020	2.338	3.491	73.821	161.546	0.275
Human carcinogenic toxicity	kg 1,4-DCB	311.310	12.265	7.773	0.019	6.901	13.839	267.638	2.154	0.722
Human non-carcinogenic toxicity	kg 1,4-DCB	6208.154	144.908	151.919	1.111	43.099	67.362	2324.051	3471.567	4.137
Land use	m2a crop eq	56.689	1.434	2.494	0.022	0.920	3.373	45.955	2.294	0.196
Mineral resource scarcity	kg Cu eq	2.858	0.340	0.655	0.003	0.132	0.201	1.465	0.052	0.011
Fossil resource scarcity	kg oil eq	835.049	8.132	14.760	3.826	20.739	24.379	748.664	11.809	2.741
Water consumption	m3	25.210	4.734	1.255	11.398	0.490	0.133	6.540	0.549	0.110

Table S37: Environmental impacts of **PAC 3.3 DS** for 1m^3 of leachate entering the process. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	18.654	1.050	2.265	2.477	1.881	1.020	1.122	2.437	6.089	0.312
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	0.830	0.117	0.187	0.007	0.047	0.015	0.040	0.374	0.002	0.042
Ozone formation, Human health	kg NOx eq	0.026	0.003	0.007	0.001	0.003	0.003	0.003	0.005	0.001	0.000
Fine particulate matter formation	kg PM2.5 eq	0.040	0.025	0.006	0.001	0.002	0.001	0.002	0.003	0.000	0.000
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.027	0.003	0.007	0.001	0.004	0.003	0.003	0.005	0.001	0.001
Terrestrial acidification	kg SO2 eq	0.121	0.085	0.011	0.002	0.006	0.002	0.005	0.008	0.001	0.001
Freshwater eutrophication	kg P eq	0.011	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.007	0.000
Marine eutrophication	kg N eq	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	83.174	31.860	28.278	0.119	2.954	15.518	1.138	2.773	0.336	0.198
Freshwater ecotoxicity	kg 1,4-DCB	1.259	0.212	0.330	0.001	0.068	0.028	0.018	0.038	0.556	0.008
Marine ecotoxicity	kg 1,4-DCB	1.701	0.293	0.429	0.001	0.089	0.046	0.025	0.051	0.755	0.010
Human carcinogenic toxicity	kg 1,4-DCB	1.468	0.468	0.296	0.001	0.263	0.183	0.040	0.178	0.010	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	32.331	5.525	5.792	0.061	1.643	0.892	0.787	1.242	16.232	0.158
Land use	m2a crop eq	0.294	0.055	0.095	0.001	0.035	0.045	0.014	0.031	0.011	0.007
Mineral resource scarcity	kg Cu eq	0.049	0.013	0.025	0.000	0.005	0.003	0.001	0.002	0.000	0.000
Fossil resource scarcity	kg oil eq	3.160	0.310	0.563	0.209	0.791	0.323	0.282	0.523	0.055	0.105
Water consumption	m3	0.892	0.180	0.048	0.623	0.019	0.002	0.003	0.012	0.003	0.004

Table S38: Environmental impacts of **PAC 3.3 DS** for 1g of PFAS removed. **(Landfilling scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Virgin activated carbon, granular**	**Recovered activated carbon, granular**	**Sewage sludge, sanitary landfill**	**Electricity, medium voltage {IT}**
Global warming	kg CO2 eq	1125.188	63.339	136.600	149.442	113.454	61.553	67.676	147.024	367.275	18.825
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	50.053	7.042	11.284	0.425	2.808	0.895	2.425	22.560	0.092	2.522
Ozone formation, Human health	kg NOx eq	1.567	0.192	0.397	0.080	0.195	0.185	0.160	0.276	0.053	0.029
Fine particulate matter formation	kg PM2.5 eq	2.412	1.513	0.343	0.035	0.123	0.053	0.121	0.180	0.028	0.016
Ozone formation, Terrestrial ecosystems	kg NOx eq	1.633	0.202	0.402	0.082	0.215	0.198	0.163	0.285	0.055	0.031
Terrestrial acidification	kg SO2 eq	7.310	5.117	0.653	0.104	0.380	0.114	0.318	0.510	0.074	0.041
Freshwater eutrophication	kg P eq	0.663	0.032	0.077	0.000	0.035	0.005	0.027	0.043	0.438	0.004
Marine eutrophication	kg N eq	0.086	0.002	0.006	0.000	0.072	0.001	0.002	0.003	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	5017.078	1921.812	1705.759	7.163	178.178	936.072	68.621	167.256	20.250	11.968
Freshwater ecotoxicity	kg 1,4-DCB	75.952	12.790	19.900	0.042	4.094	1.713	1.092	2.270	33.562	0.490
Marine ecotoxicity	kg 1,4-DCB	102.591	17.657	25.893	0.067	5.377	2.789	1.510	3.104	45.561	0.633
Human carcinogenic toxicity	kg 1,4-DCB	88.527	28.205	17.874	0.064	15.870	11.058	2.440	10.748	0.607	1.660
Human non-carcinogenic toxicity	kg 1,4-DCB	1950.192	333.238	349.362	3.661	99.113	53.823	47.482	74.901	979.098	9.514
Land use	m2a crop eq	17.709	3.298	5.736	0.073	2.115	2.695	0.837	1.857	0.647	0.451
Mineral resource scarcity	kg Cu eq	2.957	0.781	1.507	0.008	0.304	0.160	0.033	0.123	0.015	0.026
Fossil resource scarcity	kg oil eq	190.629	18.700	33.944	12.609	47.692	19.479	17.008	31.562	3.330	6.304
Water consumption	m3	53.830	10.887	2.886	37.563	1.128	0.107	0.152	0.699	0.155	0.254

Table S39: Environmental impacts of **PAC 5 DS** for 1m^3 of leachate entering the process. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	Ca(OH)$_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	20.520	1.050	2.265	2.477	1.881	1.053	1.700	3.693	6.089	0.312
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.044	0.117	0.187	0.007	0.047	0.015	0.061	0.567	0.002	0.042
Ozone formation, Human health	kg NOx eq	0.030	0.003	0.007	0.001	0.003	0.003	0.004	0.007	0.001	0.000
Fine particulate matter formation	kg PM2.5 eq	0.043	0.025	0.006	0.001	0.002	0.001	0.003	0.005	0.000	0.000
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.031	0.003	0.007	0.001	0.004	0.003	0.004	0.007	0.001	0.001
Terrestrial acidification	kg SO2 eq	0.128	0.085	0.011	0.002	0.006	0.002	0.008	0.013	0.001	0.001
Freshwater eutrophication	kg P eq	0.012	0.001	0.001	0.000	0.001	0.000	0.001	0.001	0.007	0.000
Marine eutrophication	kg N eq	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	85.691	31.860	28.278	0.119	2.954	16.021	1.724	4.201	0.336	0.198
Freshwater ecotoxicity	kg 1,4-DCB	1.289	0.212	0.330	0.001	0.068	0.029	0.027	0.057	0.556	0.008
Marine ecotoxicity	kg 1,4-DCB	1.742	0.293	0.429	0.001	0.089	0.048	0.038	0.078	0.755	0.010
Human carcinogenic toxicity	kg 1,4-DCB	1.586	0.468	0.296	0.001	0.263	0.189	0.061	0.270	0.010	0.028
Human non-carcinogenic toxicity	kg 1,4-DCB	33.405	5.525	5.792	0.061	1.643	0.921	1.193	1.881	16.232	0.158
Land use	m2a crop eq	0.318	0.055	0.095	0.001	0.035	0.046	0.021	0.047	0.011	0.007
Mineral resource scarcity	kg Cu eq	0.050	0.013	0.025	0.000	0.005	0.003	0.001	0.003	0.000	0.000
Fossil resource scarcity	kg oil eq	3.586	0.310	0.563	0.209	0.791	0.333	0.427	0.793	0.055	0.105
Water consumption	m3	0.900	0.180	0.048	0.623	0.019	0.002	0.004	0.018	0.003	0.004

Table S40: Environmental impacts of **PAC 5 DS** for 1g of PFAS removed. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, medium voltage {IT}
Global warming	kg CO2 eq	1022.732	52.334	112.867	123.478	93.743	52.506	84.724	184.061	303.465	15.555
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	52.016	5.818	9.324	0.351	2.320	0.764	3.036	28.243	0.076	2.083
Ozone formation, Human health	kg NOx eq	1.485	0.159	0.328	0.066	0.161	0.158	0.200	0.345	0.044	0.024
Fine particulate matter formation	kg PM2.5 eq	2.123	1.250	0.283	0.029	0.102	0.046	0.152	0.226	0.023	0.013
Ozone formation, Terrestrial ecosystems	kg NOx eq	1.545	0.167	0.332	0.068	0.178	0.169	0.204	0.356	0.046	0.026
Terrestrial acidification	kg SO2 eq	6.395	4.228	0.539	0.086	0.314	0.097	0.398	0.638	0.061	0.033
Freshwater eutrophication	kg P eq	0.578	0.026	0.064	0.000	0.029	0.005	0.034	0.054	0.362	0.004
Marine eutrophication	kg N eq	0.073	0.002	0.005	0.000	0.059	0.001	0.002	0.004	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	4270.856	1587.916	1409.400	5.918	147.222	798.483	85.907	209.389	16.732	9.889
Freshwater ecotoxicity	kg 1,4-DCB	64.233	10.568	16.443	0.035	3.382	1.461	1.368	2.842	27.731	0.405
Marine ecotoxicity	kg 1,4-DCB	86.805	14.589	21.394	0.055	4.442	2.379	1.890	3.886	37.646	0.523
Human carcinogenic toxicity	kg 1,4-DCB	79.055	23.305	14.769	0.053	13.113	9.433	3.055	13.455	0.502	1.371
Human non-carcinogenic toxicity	kg 1,4-DCB	1664.898	275.342	288.664	3.025	81.893	45.912	59.443	93.769	808.989	7.861
Land use	m2a crop eq	15.851	2.725	4.739	0.060	1.748	2.299	1.048	2.325	0.535	0.372
Mineral resource scarcity	kg Cu eq	2.515	0.645	1.245	0.007	0.251	0.137	0.042	0.154	0.012	0.021
Fossil resource scarcity	kg oil eq	178.704	15.451	28.047	10.418	39.406	16.616	21.293	39.513	2.752	5.208
Water consumption	m3	44.843	8.996	2.384	31.037	0.932	0.091	0.190	0.876	0.128	0.210

Table S41: Environmental impacts of **PAC 7.3 DS** for 1m³ of leachate entering the process. **(Landfilling scenario).**

Impact category	Unit	Total	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge, sanitary landfill	Electri mediu voltag {IT}
Global warming	kg CO2 eq	23.046	1.050	2.265	2.477	1.881	1.098	2.482	5.392	6.089	0
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
Ionizing radiation	kBq Co-60 eq	1.333	0.117	0.187	0.007	0.047	0.016	0.089	0.827	0.002	0
Ozone formation, Human health	kg NOx eq	0.035	0.003	0.007	0.001	0.003	0.003	0.006	0.010	0.001	0
Fine particulate matter formation	kg PM2.5 eq	0.046	0.025	0.006	0.001	0.002	0.001	0.004	0.007	0.000	0
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.036	0.003	0.007	0.001	0.004	0.004	0.006	0.010	0.001	0
Terrestrial acidification	kg SO2 eq	0.138	0.085	0.011	0.002	0.006	0.002	0.012	0.019	0.001	0
Freshwater eutrophication	kg P eq	0.012	0.001	0.001	0.000	0.001	0.000	0.001	0.002	0.007	0
Marine eutrophication	kg N eq	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0
Terrestrial ecotoxicity	kg 1,4-DCB	89.097	31.860	28.278	0.119	2.954	16.701	2.517	6.134	0.336	0
Freshwater ecotoxicity	kg 1,4-DCB	1.329	0.212	0.330	0.001	0.068	0.031	0.040	0.083	0.556	0
Marine ecotoxicity	kg 1,4-DCB	1.797	0.293	0.429	0.001	0.089	0.050	0.055	0.114	0.755	0
Human carcinogenic toxicity	kg 1,4-DCB	1.747	0.468	0.296	0.001	0.263	0.197	0.089	0.394	0.010	0
Human non-carcinogenic toxicity	kg 1,4-DCB	34.858	5.525	5.792	0.061	1.643	0.960	1.741	2.747	16.232	0
Land use	m2a crop eq	0.351	0.055	0.095	0.001	0.035	0.048	0.031	0.068	0.011	0
Mineral resource scarcity	kg Cu eq	0.052	0.013	0.025	0.000	0.005	0.003	0.001	0.005	0.000	0
Fossil resource scarcity	kg oil eq	4.161	0.310	0.563	0.209	0.791	0.348	0.624	1.157	0.055	0
Water consumption	m3	0.910	0.180	0.048	0.623	0.019	0.002	0.006	0.026	0.003	0

Table S42: Environmental impacts of **PAC 7.3 DS** for 1g of PFAS removed. **(Landfilling scenario).**

Impact category	**Unit**	**Total**	**Sulfuric acid**	**Iron (III) chloride**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Virgin activated carbon, granular**	**Recovered activated carbon, granular**	**Sewage sludge, sanitary landfill**	**Electricity, medium voltage {IT}**
Global warming	kg CO2 eq	859.607	39.167	84.469	92.410	70.157	40.963	92.574	201.116	227.112	11.641
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	49.721	4.354	6.978	0.263	1.737	0.596	3.317	30.860	0.057	1.559
Ozone formation, Human health	kg NOx eq	1.304	0.119	0.246	0.050	0.121	0.123	0.218	0.377	0.033	0.018
Fine particulate matter formation	kg PM2.5 eq	1.720	0.935	0.212	0.022	0.076	0.036	0.166	0.247	0.017	0.010
Ozone formation, Terrestrial ecosystems	kg NOx eq	1.354	0.125	0.249	0.051	0.133	0.132	0.223	0.390	0.034	0.019
Terrestrial acidification	kg SO2 eq	5.146	3.164	0.404	0.064	0.235	0.076	0.435	0.697	0.046	0.025
Freshwater eutrophication	kg P eq	0.463	0.020	0.048	0.000	0.022	0.004	0.037	0.059	0.271	0.003
Marine eutrophication	kg N eq	0.057	0.001	0.004	0.000	0.044	0.000	0.002	0.004	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	3323.305	1188.388	1054.788	4.429	110.180	622.939	93.867	228.791	12.522	7.401
Freshwater ecotoxicity	kg 1,4-DCB	49.567	7.909	12.306	0.026	2.531	1.140	1.494	3.105	20.753	0.303
Marine ecotoxicity	kg 1,4-DCB	67.029	10.918	16.012	0.041	3.325	1.856	2.065	4.246	28.174	0.391
Human carcinogenic toxicity	kg 1,4-DCB	65.148	17.441	11.053	0.040	9.814	7.359	3.338	14.702	0.376	1.026
Human non-carcinogenic toxicity	kg 1,4-DCB	1300.204	206.064	216.035	2.264	61.288	35.818	64.951	102.457	605.443	5.883
Land use	m2a crop eq	13.097	2.039	3.547	0.045	1.308	1.793	1.145	2.541	0.400	0.279
Mineral resource scarcity	kg Cu eq	1.954	0.483	0.932	0.005	0.188	0.107	0.046	0.169	0.009	0.016
Fossil resource scarcity	kg oil eq	155.202	11.564	20.990	7.797	29.491	12.963	23.266	43.174	2.059	3.898
Water consumption	m3	33.930	6.732	1.784	23.228	0.697	0.071	0.208	0.957	0.096	0.157

Table S43: Environmental impacts of **FENTON** for $1m^3$ of leachate entering the process. **(Landfilling scenario).**

Impact category	**Unit**	**Total**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Hydrogen Peroxide**	**Cloruro ferroso 9%**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO2 eq	76.352	16.195	11.285	6.090	4.860	2.815	34.776	0.331
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.171	0.047	0.279	0.089	0.419	0.284	0.009	0.044
Ozone formation, Human health	kg NOx eq	0.068	0.009	0.019	0.018	0.006	0.009	0.005	0.001
Fine particulate matter formation	kg PM2.5 eq	0.034	0.004	0.012	0.005	0.003	0.007	0.003	0.000
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.072	0.009	0.021	0.020	0.007	0.010	0.005	0.001
Terrestrial acidification	kg SO2 eq	0.090	0.011	0.038	0.011	0.008	0.014	0.007	0.001
Freshwater eutrophication	kg P eq	0.049	0.000	0.004	0.001	0.001	0.002	0.042	0.000
Marine eutrophication	kg N eq	0.008	0.000	0.007	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	136.452	0.647	17.723	92.608	7.492	15.854	1.917	0.210
Freshwater ecotoxicity	kg 1,4-DCB	4.841	0.005	0.407	0.169	0.587	0.486	3.178	0.009
Marine ecotoxicity	kg 1,4-DCB	6.515	0.008	0.535	0.276	0.746	0.625	4.314	0.011
Human carcinogenic toxicity	kg 1,4-DCB	6.002	0.017	1.579	1.094	1.916	1.309	0.058	0.029
Human non-carcinogenic toxicity	kg 1,4-DCB	126.165	0.428	9.859	5.325	7.665	10.013	92.708	0.167
Land use	m2a crop eq	0.764	0.008	0.210	0.267	0.073	0.137	0.061	0.008
Mineral resource scarcity	kg Cu eq	0.096	0.001	0.030	0.016	0.015	0.033	0.001	0.000
Fossil resource scarcity	kg oil eq	10.983	1.488	4.744	1.927	1.665	0.732	0.315	0.111
Water consumption	m3	0.770	0.288	0.112	0.011	0.205	0.135	0.015	0.004

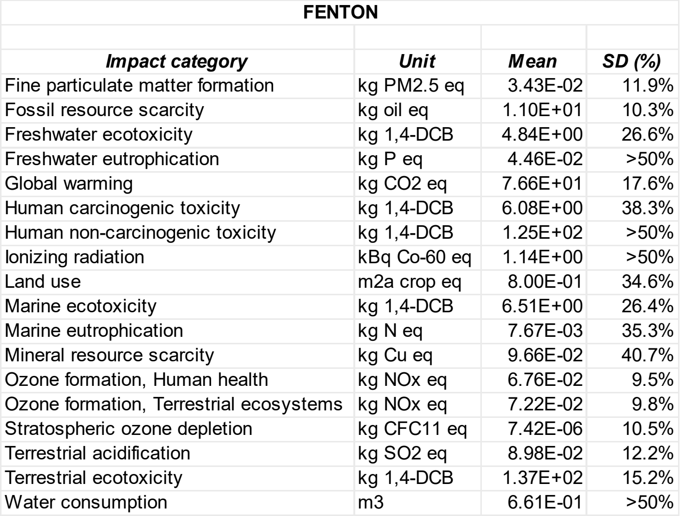
Table S44: Environmental impacts of **FENTON** for 1g of PFAS removed. **(Landfilling scenario).**

Impact category	**Unit**	**Total**	**$Ca(OH)_2$**	**Polyelectrolyte**	**Transport**	**Hydrogen Peroxide**	**Cloruro ferroso 9%**	**Sewage sludge incineration**	**Electricity, medium voltage {IT}**
Global warming	kg CO2 eq	3567.145	756.640	527.246	284.508	227.038	131.516	1624.749	15.448
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	54.701	2.179	13.051	4.138	19.591	13.265	0.409	2.069
Ozone formation, Human health	kg NOx eq	3.154	0.405	0.906	0.855	0.287	0.442	0.234	0.024
Fine particulate matter formation	kg PM2.5 eq	1.600	0.177	0.571	0.247	0.141	0.326	0.124	0.013
Ozone formation, Terrestrial ecosystems	kg NOx eq	3.368	0.414	0.999	0.916	0.318	0.453	0.244	0.025
Terrestrial acidification	kg SO2 eq	4.193	0.524	1.765	0.526	0.372	0.646	0.327	0.033
Freshwater eutrophication	kg P eq	2.291	0.002	0.165	0.024	0.063	0.095	1.939	0.004
Marine eutrophication	kg N eq	0.358	0.001	0.334	0.003	0.015	0.004	0.001	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	6375.021	30.220	828.033	4326.649	350.008	740.708	89.581	9.821
Freshwater ecotoxicity	kg 1,4-DCB	226.157	0.255	19.024	7.915	27.408	22.683	148.470	0.402
Marine ecotoxicity	kg 1,4-DCB	304.366	0.391	24.986	12.892	34.841	29.183	201.554	0.519
Human carcinogenic toxicity	kg 1,4-DCB	280.395	0.817	73.751	51.111	89.513	61.153	2.687	1.362
Human non-carcinogenic toxicity	kg 1,4-DCB	5894.427	19.996	460.600	248.778	358.094	467.827	4331.324	7.807
Land use	m2a crop eq	35.712	0.381	9.830	12.457	3.431	6.381	2.863	0.370
Mineral resource scarcity	kg Cu eq	4.501	0.043	1.412	0.742	0.688	1.531	0.064	0.021
Fossil resource scarcity	kg oil eq	513.115	69.530	221.635	90.035	77.801	34.208	14.733	5.173
Water consumption	m3	35.977	13.434	5.240	0.493	9.588	6.329	0.684	0.208

Table S45: uncertainty analysis results regarding the PAC 8.7 DS process (landfilling scenario). SD=standard deviation; Confidence interval: 95%; Runs number: 5000.

PAC 8.7 DS			
Impact category	***Unit***	***Mean***	***SD (%)***
Fine particulate matter formation	kg PM2.5 eq	4.82E-02	10.6%
Fossil resource scarcity	kg oil eq	4.54E+00	10.9%
Freshwater ecotoxicity	kg 1,4-DCB	1.37E+00	24.4%
Freshwater eutrophication	kg P eq	1.24E-02	>50%
Global warming	kg CO2 eq	2.46E+01	10.8%
Human carcinogenic toxicity	kg 1,4-DCB	2.03E+00	41.3%
Human non-carcinogenic toxicity	kg 1,4-DCB	3.62E+01	>50%
Ionizing radiation	kBq Co-60 eq	1.50E+00	>50%
Land use	m2a crop eq	4.04E-01	17.5%
Marine ecotoxicity	kg 1,4-DCB	1.85E+00	23.4%
Marine eutrophication	kg N eq	1.55E-03	28.1%
Mineral resource scarcity	kg Cu eq	5.41E-02	24.2%
Ozone formation, Human health	kg NOx eq	3.83E-02	7.4%
Ozone formation, Terrestrial ecosystems	kg NOx eq	3.98E-02	7.6%
Stratospheric ozone depletion	kg CFC11 eq	5.33E-06	6.6%
Terrestrial acidification	kg SO2 eq	1.44E-01	11.9%
Terrestrial ecotoxicity	kg 1,4-DCB	9.09E+01	16.6%
Water consumption	m3	4.81E-01	>50%

Table S46: uncertainty analysis results regarding the Fenton process (landfilling scenario). SD=standard deviation; Confidence interval: 95%; Runs number: 5000.



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Impact category	*Unit*	*Mean*	*SD (%)*
Fine particulate matter formation	kg PM2.5 eq	3.43E-02	11.9%
Fossil resource scarcity	kg oil eq	1.10E+01	10.3%
Freshwater ecotoxicity	kg 1,4-DCB	4.84E+00	26.6%
Freshwater eutrophication	kg P eq	4.46E-02	>50%
Global warming	kg CO2 eq	7.66E+01	17.6%
Human carcinogenic toxicity	kg 1,4-DCB	6.08E+00	38.3%
Human non-carcinogenic toxicity	kg 1,4-DCB	1.25E+02	>50%
Ionizing radiation	kBq Co-60 eq	1.14E+00	>50%
Land use	m2a crop eq	8.00E-01	34.6%
Marine ecotoxicity	kg 1,4-DCB	6.51E+00	26.4%
Marine eutrophication	kg N eq	7.67E-03	35.3%
Mineral resource scarcity	kg Cu eq	9.66E-02	40.7%
Ozone formation, Human health	kg NOx eq	6.76E-02	9.5%
Ozone formation, Terrestrial ecosystems	kg NOx eq	7.22E-02	9.8%
Stratospheric ozone depletion	kg CFC11 eq	7.42E-06	10.5%
Terrestrial acidification	kg SO2 eq	8.98E-02	12.2%
Terrestrial ecotoxicity	kg 1,4-DCB	1.37E+02	15.2%
Water consumption	m3	6.61E-01	>50%

Figure S4: Graphics of the results of the correlation between the different impact categories in the **incineration scenario**, the FU is the **treatment of 1m^3 of leachate**. GW=global warming; HTc=human carcinogenic toxicity; HTnc=human non-carcinogenic toxicity; PMF=particulate matter formation;

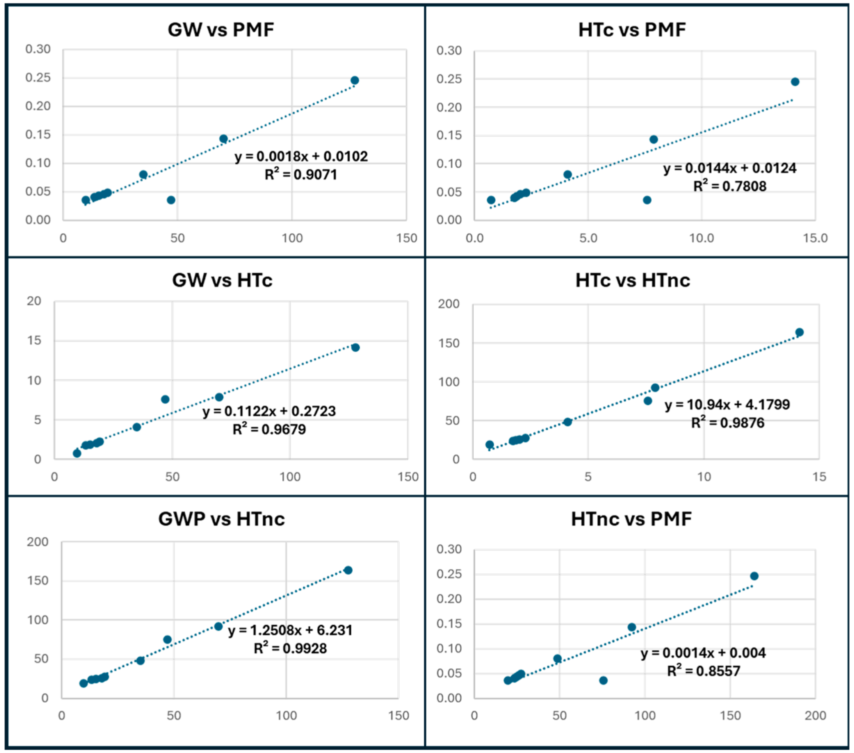


Figure S5: Graphics of the results of the correlation between the different impact categories in the **incineration scenario**, the FU is the **removal of 1g of PFAS**. GW=global warming; HTc=human carcinogenic toxicity; HTnc=human non-carcinogenic toxicity; PMF=particulate matter formation.

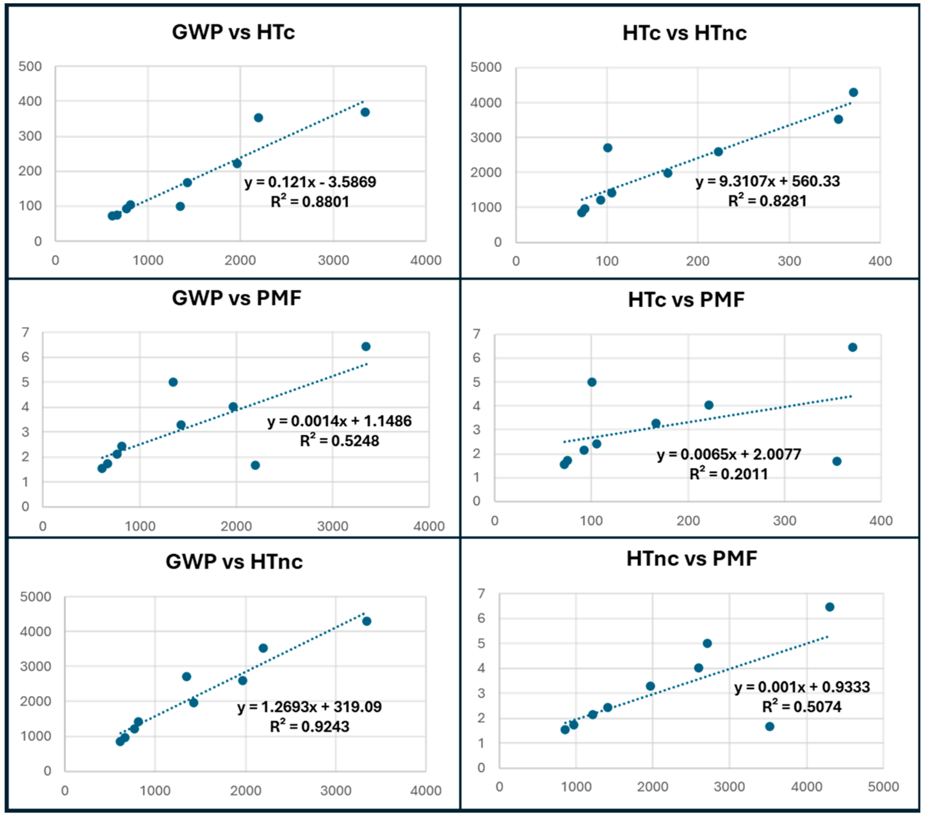


Figure S6: Graphics of the results of the correlation between the different impact categories in the **landfilling scenario**, the FU is the **treatment of 1m^3 of leachate**. GW=global warming; HTc=human carcinogenic toxicity; HTnc=human non-carcinogenic toxicity; PMF=particulate matter formation

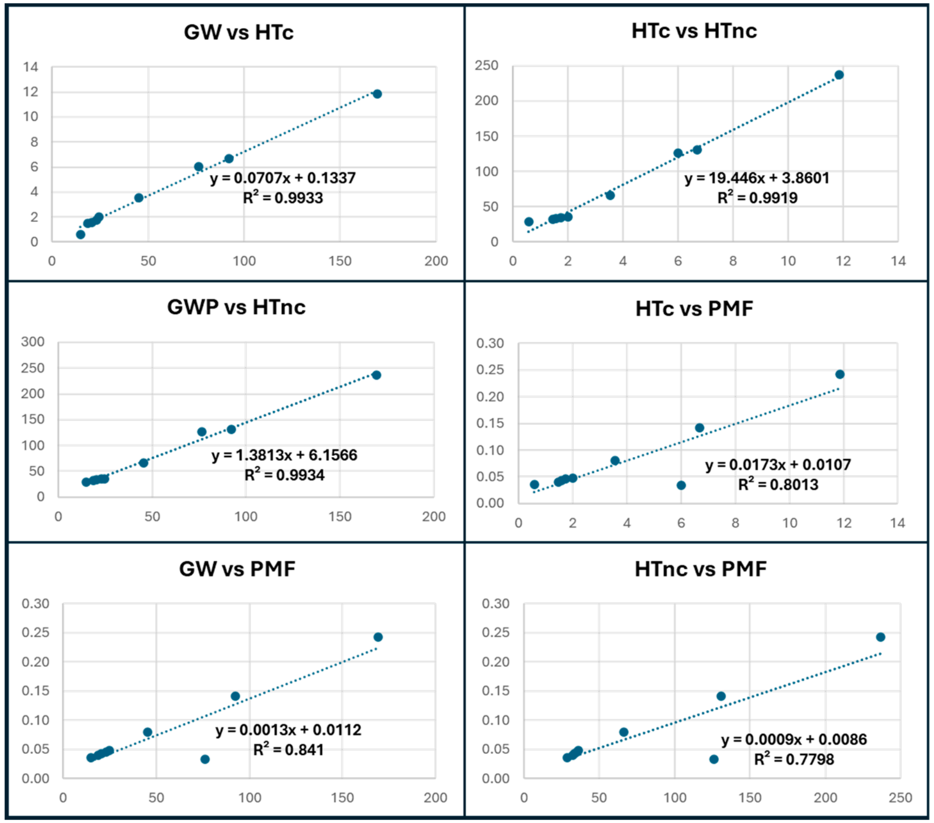
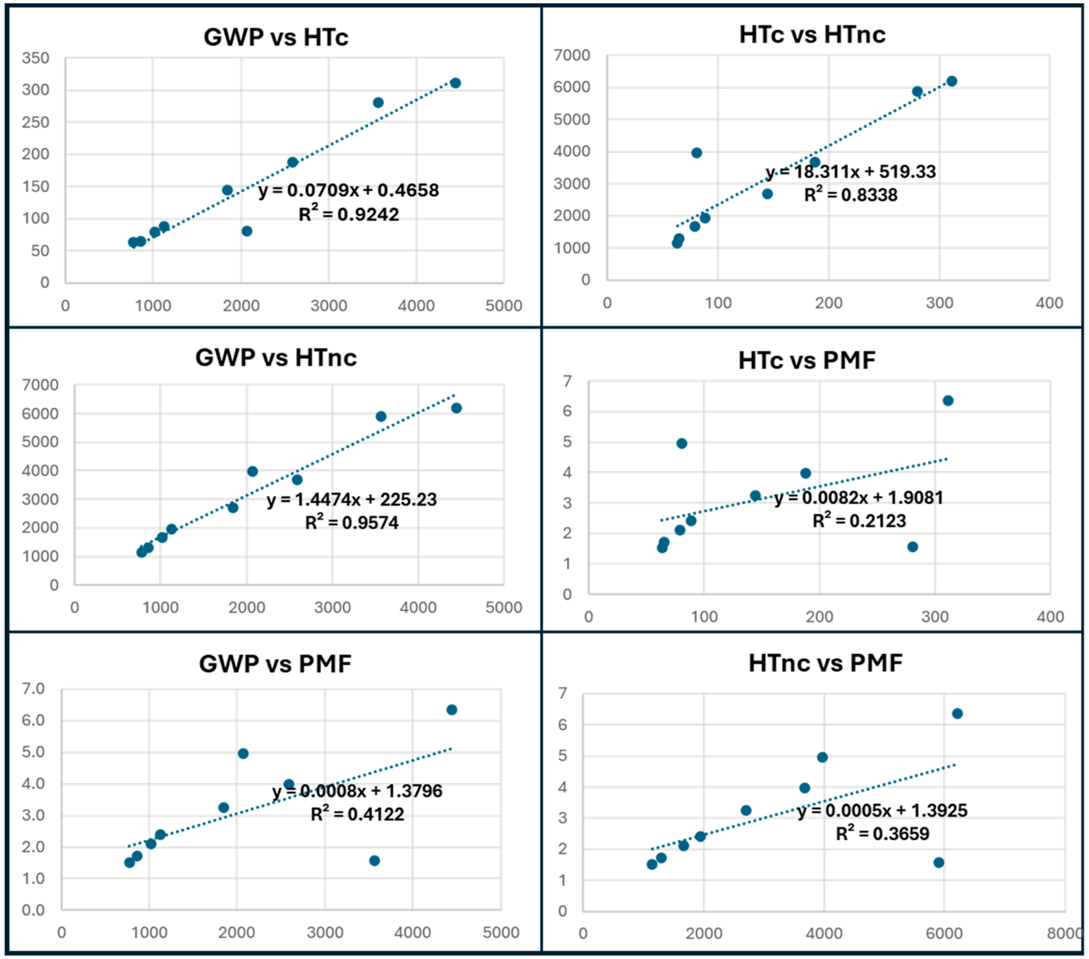


Figure S7: Graphics of the results of the correlation between the different impact categories in the **landfilling scenario**, the FU is the **removal of 1g of PFAS**. GW=global warming; HTc=human carcinogenic toxicity; HTnc=human non-carcinogenic toxicity; PMF=particulate matter formation.



GWP vs HTc

HTc vs HTnc

GWP vs HTnc

HTc vs PMF

GWP vs PMF

HTnc vs PMF

Figure S8: Graphics of the results of the correlation between the amount of PAC used in each technique (grams), the amount of sludge produced during the treatment of each technique (kilograms) and each impact category analysed in the study (GW, HTc, HTnc, PMF and Single score). The functional unit (FU) is the treatment of 1m³ of leachate.

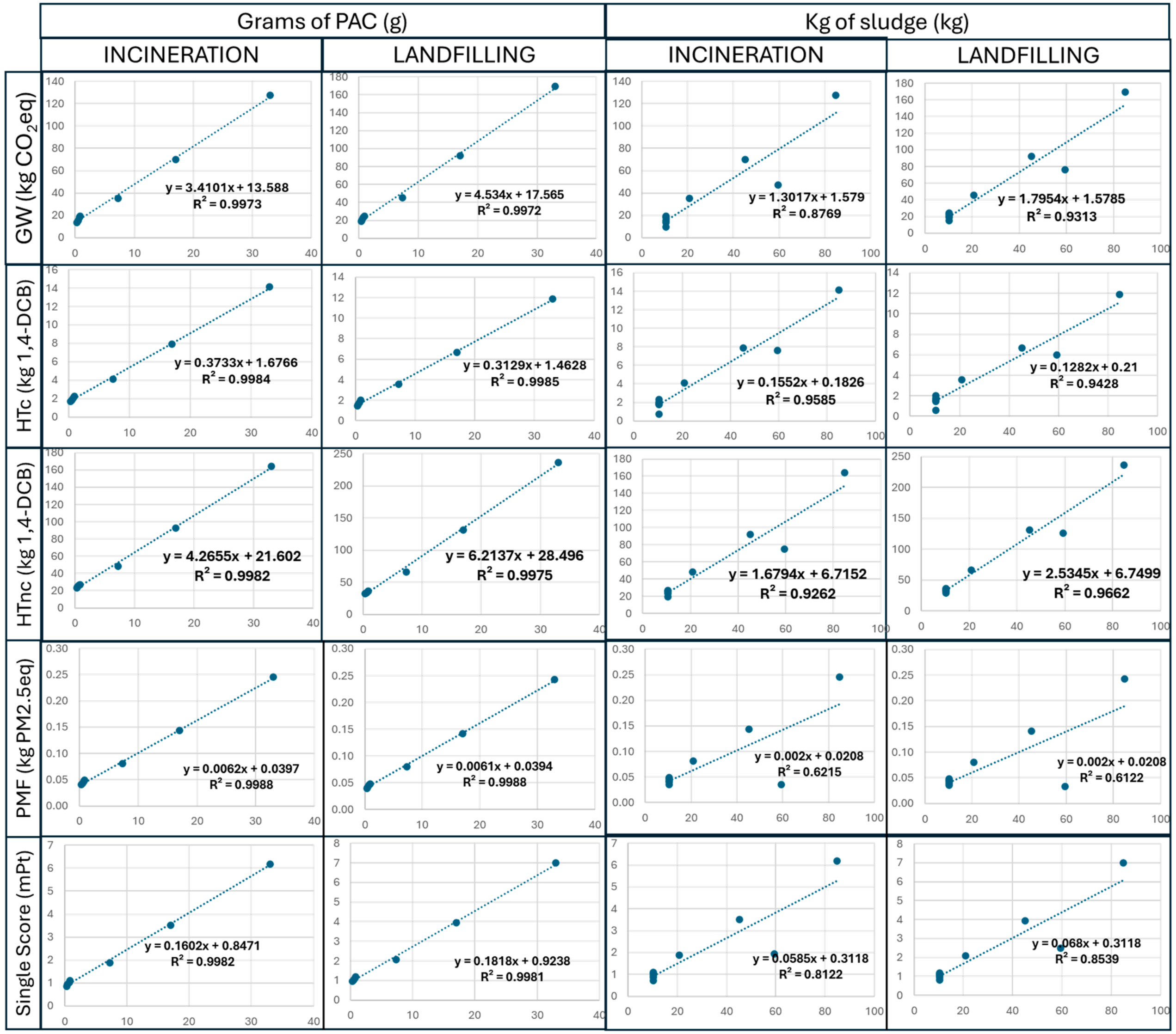


Figure S9: Graphics of the results of the correlation between the amount of PAC used in each technique (grams), the amount of sludge produced during the treatment of each technique (kilograms) and each impact category analysed in the study (GW, HTc, HTnc, PMF and Single score). The functional unit (FU) is the removal of 1g of PFAS.

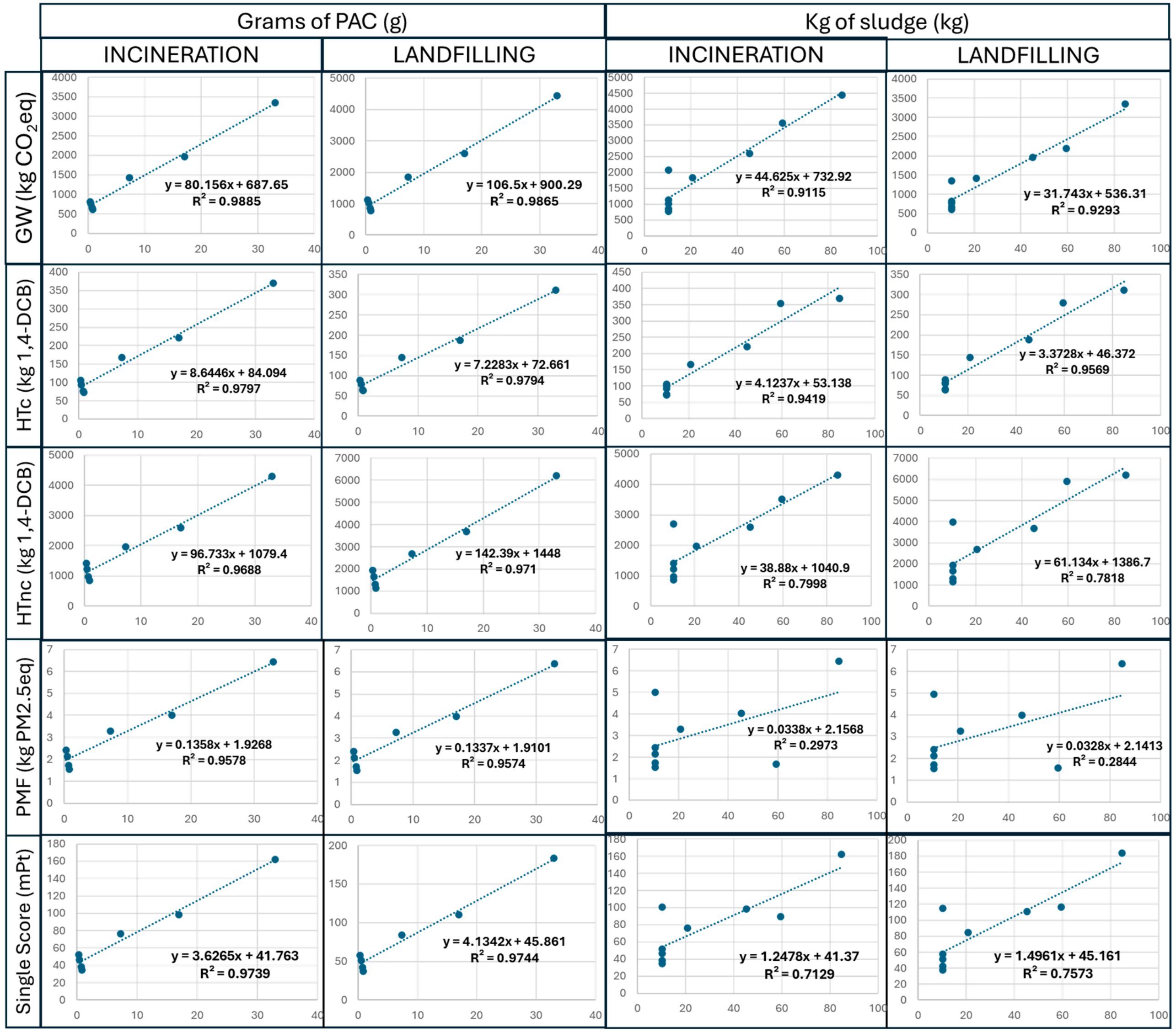
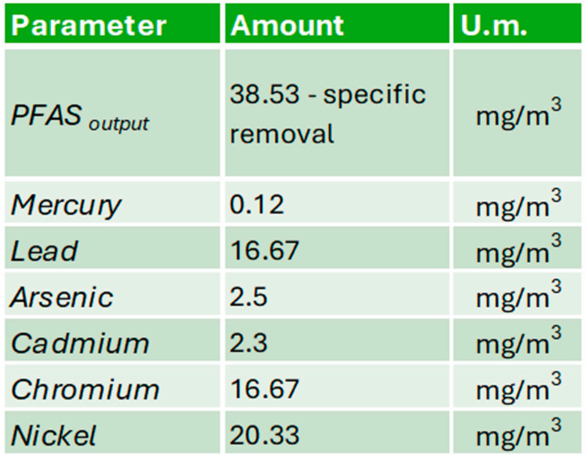


Table S47: Concentration of other ions present in the discharge. The values are taken from the annual report of the plant, which has provided the leachate sample (all the values met the legal requirements regarding surface water discharge).



Parameter	Amount	U.m.
$PFAS_{output}$	38.53 - specific removal	mg/m^3
Mercury	0.12	mg/m^3
Lead	16.67	mg/m^3
Arsenic	2.5	mg/m^3
Cadmium	2.3	mg/m^3
Chromium	16.67	mg/m^3
Nickel	20.33	mg/m^3

Table S48: Analysis results on the concentration of each PFAS in the discharge for each technique. The values represent the percentage of the single PFAS compared to the total PFAS concentration. The highlighted column represents the most representative compound, selected as representative for the total concentration. The term "ORIGINAL" indicates the values calculated starting from the analysis, and the term "NORMALIZED" indicates the same value normalised to 100% representing the results used in the following steps of the study.

Technique	Concentration of the single PFAS												**TOT concentration PFAS**
	PFBA	PFPeA	PFBS	PFHxA	PFHpA	PFHxS	PFOA	PFOS	PFNA	PFDA	PFUnDA	PFDoDA	
Fenton	21%	0%	11%	4%	0%	0%	63%	0%	0%	0%	0%	0%	100%
Fenton	24%	0%	12%	4%	0%	0%	58%	0%	0%	0%	0%	0%	100%
Fenton	31%	1%	1%	13%	8%	1%	48%	1%	1%	1%	1%	1%	100%
Fenton	41%	1%	1%	14%	9%	1%	36%	1%	1%	1%	1%	1%	100%
Clariflocc.	31%	0%	14%	4%	6%	0%	45%	1%	0%	0%	0%	0%	100%
Clariflocc.	27%	0%	11%	3%	6%	0%	52%	1%	0%	0%	0%	0%	100%
Clariflocc.	12%	3%	14%	5%	6%	0%	59%	1%	0%	0%	0%	0%	100%
Carbon post 8,7 g/L	44%	9%	16%	10%	4%	1%	18%	1%	1%	1%	1%	1%	100%
Carbon post 7,3 g/L	59%	0%	11%	6%	3%	0%	21%	0%	0%	0%	0%	0%	100%
Carbon post 7,3 g/L	31%	4%	13%	10%	6%	0%	38%	0%	0%	0%	0%	0%	100%
Carbon post 5g/L	16%	3%	6%	4%	4%	0%	66%	0%	0%	0%	0%	0%	100%
Carbon post 5g/L	21%	6%	16%	8%	6%	0%	43%	0%	0%	0%	0%	0%	100%
Carbon post 3,3g/L	25%	4%	12%	5%	6%	0%	46%	0%	0%	0%	0%	0%	100%
Carbon post 3,3g/L	25%	4%	11%	5%	6%	0%	48%	0%	0%	0%	0%	0%	100%
Fenton	8%	2%	18%	4%	6%	0%	61%	0%	0%	0%	0%	0%	100%
Fenton	16%	4%	15%	4%	5%	0%	56%	0%	0%	0%	0%	0%	100%
Fenton	17%	4%	20%	5%	4%	0%	49%	0%	0%	0%	0%	0%	100%
Carbon 7,3g/L	12%	3%	8%	4%	4%	0%	69%	0%	0%	0%	0%	0%	100%
Carbon 17g/L	18%	4%	19%	6%	4%	1%	49%	1%	1%	1%	1%	1%	100%
Carbon 33g/L	77%	3%	8%	3%	3%	3%	15%	3%	3%	3%	3%	3%	100%
Clariflocc.	1%	0%	6%	7%	12%	0%	73%	1%	0%	0%	0%	0%	100%
Clariflocc.	1%	0%	7%	7%	11%	0%	73%	1%	0%	0%	0%	0%	100%
Clariflocc.	3%	0%	7%	8%	13%	0%	67%	1%	0%	0%	0%	0%	100%
Carbon 7,3g/L	0%	0%	6%	5%	6%	0%	82%	1%	0%	0%	0%	0%	100%
Carbon 7,3g/L	0%	0%	5%	5%	7%	0%	83%	0%	0%	0%	0%	0%	100%
Carbon 17g/L	1%	13%	40%	8%	1%	1%	39%	1%	1%	1%	1%	1%	100%
Carbon 17g/L	2%	19%	27%	11%	2%	2%	43%	2%	2%	2%	2%	2%	100%
Carbon 17g/L	2%	13%	12%	8%	4%	2%	63%	2%	2%	2%	2%	2%	100%
Carbon 33g/L	10%	21%	41%	10%	10%	10%	38%	10%	10%	10%	10%	10%	100%
Carbon 33g/L	9%	34%	24%	9%	9%	9%	42%	9%	9%	9%	9%	9%	100%
Carbon 33g/L	6%	23%	44%	6%	6%	6%	34%	6%	6%	6%	6%	6%	100%
Carbon post 8,7g/L	1%	8%	18%	10%	7%	1%	57%	1%	1%	1%	1%	1%	100%

Carbon post 8,7g/L	0%	0%	11%	9%	8%	0%	71%	0%	0%	0%	0%	0%	100%
Carbon post 7,3g/L	0%	0%	9%	8%	7%	0%	75%	0%	0%	0%	0%	0%	100%
Carbon post 7,3g/L	0%	1%	11%	9%	7%	0%	72%	0%	0%	0%	0%	0%	100%
Carbon post 5g/L	0%	0%	6%	5%	7%	0%	81%	1%	0%	0%	0%	0%	100%
Carbon post 5g/L	0%	0%	8%	7%	8%	0%	76%	1%	0%	0%	0%	0%	100%
Carbon post 3,3g/L	0%	0%	9%	6%	9%	0%	75%	1%	0%	0%	0%	0%	100%
Carbon post 3,3g/L	0%	0%	12%	6%	9%	0%	73%	1%	0%	0%	0%	0%	100%
Fenton	0%	3%	18%	6%	6%	0%	66%	1%	0%	0%	0%	0%	100%
Fenton	0%	7%	11%	9%	9%	0%	64%	0%	0%	0%	0%	0%	100%
ORIGINAL	**14.6%**	**5%**	**13.9%**	**6.8%**	**6%**	**1%**	**55.8%**	**1%**	**1%**	**1%**	**1%**	**1%**	**91%**
NORMALIZED	**16.0%**		**15.2%**	**7.5%**			**61.3%**						**100.0%**

Table S49: Analysis results on input and output PFAS concentration for each technique.

AVERAGE PFAS CONC.IN	38534	ng/L
	0.038534	mg/L
	38.534	*mg/m3*
Technique	**PFAS removal efficiency**	***PFAS CONC.OUT (mg/m3)***
Chiariflocc.	21%	*30.60*
7,3 g/l PAC (ss)	65%	*13.68*
17 g/l PAC (ss)	92%	*2.93*
33 g/l PAC (ss)	99%	*0.42*
3,3 g/l PAC (ds)	44%	*21.46*
5 g/l PAC (ds)	53%	*18.07*
7,3 g/l PAC (ds)	70%	*11.48*
8,7 g/l PAC (ds)	82%	*6.86*
fenton	62%	*14.53*

Table S50: Characterisation factor (CF) for each compound and sources.

	Midpoint Human health characterization factor [cases/kgemitted] (freshwater)		Midpoint Ecotox. Charact. factor [PAF.m3.day/kgemitted] (freshwater)	Midpoint Ecotox. Charact. factor [PAF.m3.day/kgemitted] (freshwater) PFAS-ADAPTED	Endpoint Human health characterization factor [DALY/kgemitted]	Endpoint Ecotox. Charact. factor [PDF.m3.day /kgemitted]	Endpoint Ecotox. Charact. factor [PDF.m3.day/kg emitted] PFAS-ADAPTED
Parameter	**Cancer**	**Non-cancer**	**Freshwater**	**Freshwater**	**Total**	**Freshwater**	**Freshwater**
PFOA	1.26E-05	4.68E-03	1.07E+03	7.85E+01	1.28E-02	5.36E+02	3.92E+01
PFBA	n/a	n/a	8.77E+01	6.44E+00	n/a	4.39E+01	3.22E+00
PFBS	0.00E+00	1.76E-06	5.86E+02	4.09E+01	4.76E-06	2.93E+02	2.05E+01
PFHxA	0.00E+00	4.50E-06	2.95E+01	5.09E+00	1.22E-05	1.47E+01	2.54E+00
Mercury	1.52E-04	1.79E-02	2.21E+04		5.02E-02	1.10E+04	
Lead	1.44E-07	5.04E-05	6.61E+03		1.38E-04	3.30E+03	
Arsenic	3.41E-04	2.53E-02	2.77E+04		7.21E-02	1.39E+04	
Cadmium	1.75E-05	4.69E-03	2.09E+06		1.29E-02	1.05E+06	
Chromium (VI)	9.90E-03	2.23E-05	1.04E+05		1.14E-01	5.22E+04	
Nichel	1.19E-04	6.69E-06	1.82E+05		1.39E-03	9.09E+04	

🟦	USETox 2.14 on SimaPro
🟨	Holmquist H, Fantke P, Cousins IT, Owsianiak M, Liagkouridis I, Peters GM. 2020. An (eco)toxicity life cycle impact assessment framework for per- and polyfluoroalkyl substances *Environmental Science & Technology*, doi:10.1021/acs.est.9b07774
🟧	Freshwater ecotoxicity characterization factors for PFAS Rahul Aggarwal[a] [a] Environmental Systems Analysis, Chalmers University of Technology, Vera Sandbergs Allé 8, 41296, Gothenburg, Sweden
▨	n/a

Table S51: Results of toxicity contribution analysis in clariflocculation scenarios.

				Midpoint Human health [cases/kgemitted] (freshwater)		Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater)	Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater) PFAS-ADAPTED	Endpoint Human health [DALY/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted] PFAS-ADAPTED
Technique	**Parameter**	**Amount**	**u.m.**	**Cancer**	**Non-cancer**	**Freshwater**	**Freshwater**	**Total**	**Freshwater**	**Freshwater**
CLARIFLOCCULATION	*PFOA*	18.75	*mg/m3*	2.36E-10	8.77E-08	2.01E-02	1.47E-03	2.39E-07	1.01E-02	7.35E-04
	PFBA	4.90	*mg/m3*			4.30E-04	3.15E-05		2.15E-04	1.58E-05
	PFBS	4.66	*mg/m3*	0.00E+00	8.21E-12	2.73E-03	1.91E-04	2.22E-11	1.37E-03	9.54E-05
	PFHxA	2.29	*mg/m3*	0.00E+00	1.03E-11	6.75E-05	1.16E-05	2.78E-11	3.37E-05	5.82E-06
	Mercury	0.13	*mg/m3*	1.90E-11	2.24E-09	2.76E-03		6.27E-09	1.38E-03	
	Lead	16.67	*mg/m3*	2.39E-12	8.39E-10	1.10E-01		2.29E-09	5.51E-02	
	Arsenic	2.50	*mg/m3*	8.53E-10	6.32E-08	6.93E-02		1.80E-07	3.47E-02	
	Cadmium	2.30	*mg/m3*	4.02E-11	1.08E-08	4.82E+00		2.96E-08	2.41E+00	
	Chromium (VI)	16.67	*mg/m3*	1.65E-07	3.72E-10	1.74E+00		1.90E-06	8.69E-01	
	Nichel	20.33	*mg/m3*	2.42E-09	1.36E-10	3.69E+00		2.82E-08	1.85E+00	
	Process, INC	1000	*kg*	2.01E-06	3.91E-06	9.78E+04		3.37E-05	4.89E+04	
	Process, LAND	1000	*kg*	1.67E-06	3.96E-06	1.08E+05		2.98E-05	5.39E+04	

Table S52: Results of toxicity contribution analysis in PAC SS scenarios.

				Midpoint Human health [cases/kgemitted] (freshwater)		Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater)	Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater) PFAS-ADAPTED	Endpoint Human health [DALY/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted] PFAS-ADAPTED
Technique	**Parameter**	**Amount**	**u.m.**	**Cancer**	**Non-cancer**	**Freshwater**	**Freshwater**	**Total**	**Freshwater**	**Freshwater**
7,3 g/l PAC (ss)	*PFOA*	8.38	*mg/m3*	1.05E-10	3.92E-08	8.99E-03	6.58E-04	1.07E-07	4.49E-03	3.29E-04
	PFBA	2.19	*mg/m3*			1.92E-04	1.41E-05		9.61E-05	7.05E-06
	PFBS	2.08	*mg/m3*	0.00E+00	3.67E-12	1.22E-03	8.53E-05	9.91E-12	6.11E-04	4.27E-05
	PFHxA	1.02	*mg/m3*	0.00E+00	4.61E-12	3.02E-05	5.20E-06	1.24E-11	1.51E-05	2.60E-06
	Mercury	0.13	*mg/m3*	1.90E-11	2.24E-09	2.76E-03		6.27E-09	1.38E-03	
	Lead	16.67	*mg/m3*	2.39E-12	8.39E-10	1.10E-01		2.29E-09	5.51E-02	
	Arsenic	2.50	*mg/m3*	8.53E-10	6.32E-08	6.93E-02		1.80E-07	3.47E-02	
	Cadmium	2.30	*mg/m3*	4.02E-11	1.08E-08	4.82E+00		2.96E-08	2.41E+00	
	Chromium (VI)	16.67	*mg/m3*	1.65E-07	3.72E-10	1.74E+00		1.90E-06	8.69E-01	
	Nichel	20.33	*mg/m3*	2.42E-09	1.36E-10	3.69E+00		2.82E-08	1.85E+00	
	Process, INC	1000	*kg*	5.52E-06	8.94E-06	2.31E+05		8.76E-05	1.16E+05	
	Process, LAND	1000	*kg*	4.82E-06	9.05E-06	2.51E+05		7.99E-05	1.25E+05	
Technique	**Parameter**	**Amount**	**u.m.**							
17 g/l PAC (ss)	*PFOA*	1.79	*mg/m3*	2.26E-11	8.39E-09	1.92E-03	1.41E-04	2.29E-08	9.62E-04	7.04E-05
	PFBA	0.47	*mg/m3*			4.11E-05	3.02E-06		2.06E-05	1.51E-06
	PFBS	0.45	*mg/m3*	0.00E+00	7.86E-13	2.62E-04	1.83E-05	2.12E-12	1.31E-04	9.13E-06
	PFHxA	0.22	*mg/m3*	0.00E+00	9.87E-13	6.46E-06	1.11E-06	2.66E-12	3.23E-06	5.57E-07
	Mercury	0.13	*mg/m3*	1.90E-11	2.24E-09	2.76E-03		6.27E-09	1.38E-03	
	Lead	16.67	*mg/m3*	2.39E-12	8.39E-10	1.10E-01		2.29E-09	5.51E-02	
	Arsenic	2.50	*mg/m3*	8.53E-10	6.32E-08	6.93E-02		1.80E-07	3.47E-02	
	Cadmium	2.30	*mg/m3*	4.02E-11	1.08E-08	4.82E+00		2.96E-08	2.41E+00	
	Chromium (VI)	16.67	*mg/m3*	1.65E-07	3.72E-10	1.74E+00		1.90E-06	8.69E-01	
	Nichel	20.33	*mg/m3*	2.42E-09	1.36E-10	3.69E+00		2.82E-08	1.85E+00	
	Process, INC	1000	*kg*	1.06E-05	1.63E-05	4.32E+05		1.66E-04	2.16E+05	
	Process, LAND	1000	*kg*	9.12E-06	1.65E-05	4.75E+05		1.50E-04	2.37E+05	
Technique	**Parameter**	**Amount**	**u.m.**							
33 g/l PAC (ss)	*PFOA*	0.26	*mg/m3*	3.27E-12	1.21E-09	2.79E-04	2.04E-05	3.32E-09	1.39E-04	1.02E-05
	PFBA	0.07	*mg/m3*			5.95E-06	4.37E-07		2.98E-06	2.18E-07
	PFBS	0.06	*mg/m3*	0.00E+00	1.14E-13	3.79E-05	2.64E-06	3.07E-13	1.89E-05	1.32E-06
	PFHxA	0.03	*mg/m3*	0.00E+00	1.43E-13	9.35E-07	1.61E-07	3.86E-13	4.67E-07	8.06E-08
	Mercury	0.13	*mg/m3*	1.90E-11	2.24E-09	2.76E-03		6.27E-09	1.38E-03	
	Lead	16.67	*mg/m3*	2.39E-12	8.39E-10	1.10E-01		2.29E-09	5.51E-02	
	Arsenic	2.50	*mg/m3*	8.53E-10	6.32E-08	6.93E-02		1.80E-07	3.47E-02	
	Cadmium	2.30	*mg/m3*	4.02E-11	1.08E-08	4.82E+00		2.96E-08	2.41E+00	
	Chromium (VI)	16.67	*mg/m3*	1.65E-07	3.72E-10	1.74E+00		1.90E-06	8.69E-01	
	Nichel	20.33	*mg/m3*	2.42E-09	1.36E-10	3.69E+00		2.82E-08	1.85E+00	
	Process, INC	1000	*kg*	1.90E-05	2.84E-05	7.61E+05		2.96E-04	3.81E+05	
	Process, LAND	1000	*kg*	1.62E-05	2.89E-05	8.42E+05		2.64E-04	4.21E+05	

Table S53: Results of toxicity contribution analysis in PAC DS scenarios.

				Midpoint Human health [cases/kgemitted] (freshwater)		Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater)	Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater) PFAS-ADAPTED	Endpoint Human health [DALY/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted] PFAS-ADAPTED
Technique	**Parameter**	**Amount**	**u.m.**	**Cancer**	**Non-cancer**	**Freshwater**	**Freshwater**	**Total**	**Freshwater**	**Freshwater**
3,3 g/l PAC (ds)	*PFOA*	13.15	*mg/m3*	1.65E-10	6.15E-08	1.41E-02	1.03E-03	1.68E-07	7.05E-03	5.16E-04
	PFBA	3.44	*mg/m3*			3.01E-04	2.21E-05		1.51E-04	1.11E-05
	PFBS	3.27	*mg/m3*	0.00E+00	5.76E-12	1.92E-03	1.34E-04	1.56E-11	9.59E-04	6.69E-05
	PFHxA	1.61	*mg/m3*	0.00E+00	7.23E-12	4.73E-05	8.17E-06	1.95E-11	2.37E-05	4.08E-06
	Mercury	0.13	*mg/m3*	1.90E-11	2.24E-09	2.76E-03		6.27E-09	1.38E-03	
	Lead	16.67	*mg/m3*	2.39E-12	8.39E-10	1.10E-01		2.29E-09	5.51E-02	
	Arsenic	2.50	*mg/m3*	8.53E-10	6.32E-08	6.93E-02		1.80E-07	3.47E-02	
	Cadmium	2.30	*mg/m3*	4.02E-11	1.08E-08	4.82E+00		2.96E-08	2.41E+00	
	Chromium (VI)	16.67	*mg/m3*	1.65E-07	3.72E-10	1.74E+00		1.90E-06	8.69E-01	
	Nichel	20.33	*mg/m3*	2.42E-09	1.36E-10	3.69E+00		2.82E-08	1.85E+00	
	Process, INC	1000	*kg*	2.41E-06	4.41E-06	1.08E+05		3.96E-05	5.40E+04	
	Process, LAND	1000	*kg*	2.06E-06	4.47E-06	1.18E+05		3.57E-05	5.90E+04	
Technique	**Parameter**	**Amount**	**u.m.**							
5 g/l PAC (ds)	*PFOA*	11.07	*mg/m3*	1.39E-10	5.18E-08	1.19E-02	8.69E-04	1.41E-07	5.94E-03	4.34E-04
	PFBA	2.89	*mg/m3*			2.54E-04	1.86E-05		1.27E-04	9.32E-06
	PFBS	2.75	*mg/m3*	0.00E+00	4.85E-12	1.61E-03	1.13E-04	1.31E-11	8.07E-04	5.64E-05
	PFHxA	1.35	*mg/m3*	0.00E+00	6.09E-12	3.99E-05	6.88E-06	1.64E-11	1.99E-05	3.44E-06
	Mercury	0.13	*mg/m3*	1.90E-11	2.24E-09	2.76E-03		6.27E-09	1.38E-03	
	Lead	16.67	*mg/m3*	2.39E-12	8.39E-10	1.10E-01		2.29E-09	5.51E-02	
	Arsenic	2.50	*mg/m3*	8.53E-10	6.32E-08	6.93E-02		1.80E-07	3.47E-02	
	Cadmium	2.30	*mg/m3*	4.02E-11	1.08E-08	4.82E+00		2.96E-08	2.41E+00	
	Chromium (VI)	16.67	*mg/m3*	1.65E-07	3.72E-10	1.74E+00		1.90E-06	8.69E-01	
	Nichel	20.33	*mg/m3*	2.42E-09	1.36E-10	3.69E+00		2.82E-08	1.85E+00	
	Process, INC	1000	*kg*	2.61E-06	4.68E-06	1.13E+05		4.26E-05	5.66E+04	
	Process, LAND	1000	*kg*	2.26E-06	4.73E-06	1.23E+05		3.88E-05	6.16E+04	
Technique	**Parameter**	**Amount**	**u.m.**							
7,3 g/l PAC (ds)	*PFOA*	7.04	*mg/m3*	8.85E-11	3.29E-08	7.55E-03	5.52E-04	8.99E-08	3.77E-03	2.76E-04
	PFBA	1.84	*mg/m3*			1.61E-04	1.18E-05		8.06E-05	5.92E-06
	PFBS	1.75	*mg/m3*	0.00E+00	3.08E-12	1.03E-03	7.16E-05	8.32E-12	5.13E-04	3.58E-05
	PFHxA	0.86	*mg/m3*	0.00E+00	3.87E-12	2.53E-05	4.37E-06	1.04E-11	1.27E-05	2.18E-06
	Mercury	0.13	*mg/m3*	1.90E-11	2.24E-09	2.76E-03		6.27E-09	1.38E-03	
	Lead	16.67	*mg/m3*	2.39E-12	8.39E-10	1.10E-01		2.29E-09	5.51E-02	
	Arsenic	2.50	*mg/m3*	8.53E-10	6.32E-08	6.93E-02		1.80E-07	3.47E-02	
	Cadmium	2.30	*mg/m3*	4.02E-11	1.08E-08	4.82E+00		2.96E-08	2.41E+00	
	Chromium (VI)	16.67	*mg/m3*	1.65E-07	3.72E-10	1.74E+00		1.90E-06	8.69E-01	
	Nichel	20.33	*mg/m3*	2.42E-09	1.36E-10	3.69E+00		2.82E-08	1.85E+00	
	Process, INC	1000	*kg*	2.88E-06	5.03E-06	1.20E+05		4.67E-05	6.02E+04	
	Process, LAND	1000	*kg*	2.53E-06	5.08E-06	1.30E+05		4.29E-05	6.51E+04	
Technique	**Parameter**	**Amount**	**u.m.**							
8,7 g/l PAC (ds)	*PFOA*	4.20	*mg/m3*	5.29E-11	1.97E-08	4.51E-03	3.30E-04	5.37E-08	2.25E-03	1.65E-04
	PFBA	1.10	*mg/m3*			9.63E-05	7.07E-06		4.82E-05	3.54E-06
	PFBS	1.05	*mg/m3*	0.00E+00	1.84E-12	6.13E-04	4.28E-05	4.97E-12	3.06E-04	2.14E-05
	PFHxA	0.51	*mg/m3*	0.00E+00	2.31E-12	1.51E-05	2.61E-06	6.24E-12	7.56E-06	1.30E-06
	Mercury	0.13	*mg/m3*	1.90E-11	2.24E-09	2.76E-03		6.27E-09	1.38E-03	
	Lead	16.67	*mg/m3*	2.39E-12	8.39E-10	1.10E-01		2.29E-09	5.51E-02	
	Arsenic	2.50	*mg/m3*	8.53E-10	6.32E-08	6.93E-02		1.80E-07	3.47E-02	
	Cadmium	2.30	*mg/m3*	4.02E-11	1.08E-08	4.82E+00		2.96E-08	2.41E+00	
	Chromium (VI)	16.67	*mg/m3*	1.65E-07	3.72E-10	1.74E+00		1.90E-06	8.69E-01	
	Nichel	20.33	*mg/m3*	2.42E-09	1.36E-10	3.69E+00		2.82E-08	1.85E+00	
	Process, INC	1000	*kg*	3.05E-06	5.25E-06	1.25E+05		4.92E-05	6.23E+04	
	Process, LAND	1000	*kg*	2.70E-06	5.30E-06	1.35E+05		4.54E-05	6.73E+04	

Table S54: Results of toxicity contribution analysis in Fenton scenarios.

				Midpoint Human health [cases/kgemitted] (freshwater)		Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater)	Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater) PFAS-ADAPTED	Endpoint Human health [DALY/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted] PFAS-ADAPTED
Technique	**Parameter**	**Amount**	**u.m.**	**Cancer**	**Non-cancer**	**Freshwater**	**Freshwater**	**Total**	**Freshwater**	**Freshwater**
Fenton	*PFOA*	8.90	*mg/m3*	1.12E-10	4.16E-08	9.55E-03	6.98E-04	1.14E-07	4.77E-03	3.49E-04
	PFBA	2.33	*mg/m3*			2.04E-04	1.50E-05		1.02E-04	7.49E-06
	PFBS	2.21	*mg/m3*	0.00E+00	3.90E-12	1.30E-03	9.06E-05	1.05E-11	6.49E-04	4.53E-05
	PFHxA	1.09	*mg/m3*	0.00E+00	4.89E-12	3.20E-05	5.53E-06	1.32E-11	1.60E-05	2.76E-06
	Mercury	0.13	*mg/m3*	1.90E-11	2.24E-09	2.76E-03		6.27E-09	1.38E-03	
	Lead	16.67	*mg/m3*	2.39E-12	8.39E-10	1.10E-01		2.29E-09	5.51E-02	
	Arsenic	2.50	*mg/m3*	8.53E-10	6.32E-08	6.93E-02		1.80E-07	3.47E-02	
	Cadmium	2.30	*mg/m3*	4.02E-11	1.08E-08	4.82E+00		2.96E-08	2.41E+00	
	Chromium (VI)	16.67	*mg/m3*	1.65E-07	3.72E-10	1.74E+00		1.90E-06	8.69E-01	
	Nichel	20.33	*mg/m3*	2.42E-09	1.36E-10	3.69E+00		2.82E-08	1.85E+00	
	Process, INC	1000	*kg*	1.01E-05	9.77E-06	3.11E+05		1.43E-04	1.55E+05	
	Process, LAND	1000	*kg*	8.14E-06	1.01E-05	3.67E+05		1.21E-04	1.84E+05	

Table S55: Environmental impacts of the **sensitivity analysis** of **PAC 3.3 DS** for 1m³ of leachate entering the process. **(Landfilling scenario). SE=Sweden Electricity Grid. PL=Poland Electricity Grid.**

Impact category	Unit	Total SE	Total PL	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, SE	Electricity, PL
Global warming	kg CO2 eq	18.377	19.070	1.050	2.265	2.477	1.881	1.020	1.122	2.437	6.089	0.035	0.728
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	0.972	0.811	0.117	0.187	0.007	0.047	0.015	0.040	0.374	0.002	0.184	0.023
Ozone formation, Human health	kg NOx eq	0.026	0.027	0.003	0.007	0.001	0.003	0.003	0.003	0.005	0.001	0.000	0.001
Fine particulate matter formation	kg PM2.5 eq	0.040	0.041	0.025	0.006	0.001	0.002	0.001	0.002	0.003	0.000	0.000	0.001
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.027	0.028	0.003	0.007	0.001	0.004	0.003	0.003	0.005	0.001	0.000	0.001
Terrestrial acidification	kg SO2 eq	0.121	0.124	0.085	0.011	0.002	0.006	0.002	0.005	0.008	0.001	0.000	0.004
Freshwater eutrophication	kg P eq	0.011	0.012	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.007	0.000	0.001
Marine eutrophication	kg N eq	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	83.564	85.997	31.860	28.278	0.119	2.954	15.518	1.138	2.773	0.336	0.588	3.021
Freshwater ecotoxicity	kg 1,4-DCB	1.256	1.276	0.212	0.330	0.001	0.068	0.028	0.018	0.038	0.556	0.005	0.025
Marine ecotoxicity	kg 1,4-DCB	1.698	1.731	0.293	0.429	0.001	0.089	0.046	0.025	0.051	0.755	0.007	0.040
Human carcinogenic toxicity	kg 1,4-DCB	1.443	1.510	0.468	0.296	0.001	0.263	0.183	0.040	0.178	0.010	0.003	0.070
Human non-carcinogenic toxicity	kg 1,4-DCB	32.307	33.385	5.525	5.792	0.061	1.643	0.892	0.787	1.242	16.232	0.134	1.212
Land use	m2a crop eq	0.300	0.302	0.055	0.095	0.001	0.035	0.045	0.014	0.031	0.011	0.014	0.016
Mineral resource scarcity	kg Cu eq	0.049	0.049	0.013	0.025	0.000	0.005	0.003	0.001	0.002	0.000	0.000	0.000
Fossil resource scarcity	kg oil eq	3.061	3.243	0.310	0.563	0.209	0.791	0.323	0.282	0.523	0.055	0.005	0.188
Water consumption	m3	0.893	0.911	0.180	0.048	0.623	0.019	0.002	0.003	0.012	0.003	0.005	0.023

Table S56: Environmental impacts of the **sensitivity analysis** of **PAC 8.7 DS** for 1m³ of leachate entering the process. **(Landfilling scenario). SE=Sweden Electricity Grid. PL=Poland Electricity Grid.**

Impact category	Unit	Total SE	Total PL	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge, sanitary landfill	Electricity, SE	Electricity, PL
Global warming	kg CO2 eq	24.239	24.932	1.050	2.265	2.477	1.881	1.125	2.890	6.426	6.089	0.035	0.728
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.647	1.486	0.117	0.187	0.007	0.047	0.016	0.101	0.986	0.002	0.184	0.023
Ozone formation, Human health	kg NOx eq	0.038	0.039	0.003	0.007	0.001	0.003	0.003	0.007	0.012	0.001	0.000	0.001
Fine particulate matter formation	kg PM2.5 eq	0.048	0.049	0.025	0.006	0.001	0.002	0.001	0.005	0.008	0.000	0.000	0.001
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.039	0.040	0.003	0.007	0.001	0.004	0.004	0.007	0.012	0.001	0.000	0.001
Terrestrial acidification	kg SO2 eq	0.143	0.147	0.085	0.011	0.002	0.006	0.002	0.014	0.022	0.001	0.000	0.004
Freshwater eutrophication	kg P eq	0.013	0.014	0.001	0.001	0.000	0.001	0.000	0.001	0.002	0.007	0.000	0.001
Marine eutrophication	kg N eq	0.002	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	91.230	93.663	31.860	28.278	0.119	2.954	17.115	2.670	7.310	0.336	0.588	3.021
Freshwater ecotoxicity	kg 1,4-DCB	1.356	1.376	0.212	0.330	0.001	0.068	0.031	0.053	0.099	0.556	0.005	0.025
Marine ecotoxicity	kg 1,4-DCB	1.836	1.869	0.293	0.429	0.001	0.089	0.051	0.074	0.136	0.755	0.007	0.040
Human carcinogenic toxicity	kg 1,4-DCB	1.982	2.049	0.468	0.296	0.001	0.263	0.202	0.269	0.470	0.010	0.003	0.070
Human non-carcinogenic toxicity	kg 1,4-DCB	35.979	37.057	5.525	5.792	0.061	1.643	0.984	2.336	3.274	16.232	0.134	1.212
Land use	m2a crop eq	0.388	0.390	0.055	0.095	0.001	0.035	0.049	0.046	0.081	0.011	0.014	0.016
Mineral resource scarcity	kg Cu eq	0.053	0.053	0.013	0.025	0.000	0.005	0.003	0.001	0.005	0.000	0.000	0.000
Fossil resource scarcity	kg oil eq	4.421	4.603	0.310	0.563	0.209	0.791	0.356	0.752	1.379	0.055	0.005	0.188
Water consumption	m3	0.916	0.934	0.180	0.048	0.623	0.019	0.002	0.007	0.031	0.003	0.005	0.023

Table S57: Environmental impacts of the **sensitivity analysis** of **PAC 3.3 DS** for 1m^3 of leachate entering the process. **(Incineration scenario). SE=Sweden Electricity Grid. PL=Poland Electricity Grid.**

Impact category	Unit	Total SE	Total PL	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge, incineration	Electricity, SE	Electricity, PL
Global warming	kg CO2 eq	13.243	13.936	1.050	2.265	2.477	1.881	1.020	1.122	2.437	0.955	0.035	0.728
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	0.976	0.815	0.117	0.187	0.007	0.047	0.015	0.040	0.374	0.005	0.184	0.023
Ozone formation, Human health	kg NOx eq	0.031	0.032	0.003	0.007	0.001	0.003	0.003	0.003	0.005	0.006	0.000	0.001
Fine particulate matter formation	kg PM2.5 eq	0.040	0.041	0.025	0.006	0.001	0.002	0.001	0.002	0.003	0.001	0.000	0.001
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.032	0.033	0.003	0.007	0.001	0.004	0.003	0.003	0.005	0.006	0.000	0.001
Terrestrial acidification	kg SO2 eq	0.122	0.125	0.085	0.011	0.002	0.006	0.002	0.005	0.008	0.003	0.000	0.004
Freshwater eutrophication	kg P eq	0.007	0.008	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.003	0.000	0.001
Marine eutrophication	kg N eq	0.002	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	84.413	86.846	31.860	28.278	0.119	2.954	15.518	1.138	2.773	1.185	0.588	3.021
Freshwater ecotoxicity	kg 1,4-DCB	1.033	1.053	0.212	0.330	0.001	0.068	0.028	0.018	0.038	0.334	0.005	0.025
Marine ecotoxicity	kg 1,4-DCB	1.379	1.412	0.293	0.429	0.001	0.089	0.046	0.025	0.051	0.437	0.007	0.040
Human carcinogenic toxicity	kg 1,4-DCB	1.719	1.786	0.468	0.296	0.001	0.263	0.183	0.040	0.178	0.286	0.003	0.070
Human non-carcinogenic toxicity	kg 1,4-DCB	23.408	24.486	5.525	5.792	0.061	1.643	0.892	0.787	1.242	7.333	0.134	1.212
Land use	m2a crop eq	0.295	0.296	0.055	0.095	0.001	0.035	0.045	0.014	0.031	0.005	0.014	0.016
Mineral resource scarcity	kg Cu eq	0.051	0.051	0.013	0.025	0.000	0.005	0.003	0.001	0.002	0.002	0.000	0.000
Fossil resource scarcity	kg oil eq	3.102	3.285	0.310	0.563	0.209	0.791	0.323	0.282	0.523	0.097	0.005	0.188
Water consumption	m3	0.893	0.911	0.180	0.048	0.623	0.019	0.002	0.003	0.012	0.003	0.005	0.023

Table S58: Environmental impacts of the **sensitivity analysis** of **PAC 8.7 DS** for 1m^3 of leachate entering the process. **(Incineration scenario). SE=Sweden Electricity Grid. PL=Poland Electricity Grid.**

Impact category	Unit	Total SE	Total PL	Sulfuric acid	Iron (III) chloride	$Ca(OH)_2$	Polyelectrolyte	Transport	Virgin activated carbon, granular	Recovered activated carbon, granular	Sewage sludge, incineration	Electricity, SE	Electricity, PL
Global warming	kg CO2 eq	19.105	19.798	1.050	2.265	2.477	1.881	1.125	2.890	6.426	0.955	0.035	0.728
Stratospheric ozone depletion	kg CFC11 eq	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ionizing radiation	kBq Co-60 eq	1.650	1.489	0.117	0.187	0.007	0.047	0.016	0.101	0.986	0.005	0.184	0.023
Ozone formation, Human health	kg NOx eq	0.043	0.044	0.003	0.007	0.001	0.003	0.003	0.007	0.012	0.006	0.000	0.001
Fine particulate matter formation	kg PM2.5 eq	0.048	0.050	0.025	0.006	0.001	0.002	0.001	0.005	0.008	0.001	0.000	0.001
Ozone formation, Terrestrial ecosystems	kg NOx eq	0.044	0.045	0.003	0.007	0.001	0.004	0.004	0.007	0.012	0.006	0.000	0.001
Terrestrial acidification	kg SO2 eq	0.144	0.148	0.085	0.011	0.002	0.006	0.002	0.014	0.022	0.003	0.000	0.004
Freshwater eutrophication	kg P eq	0.009	0.010	0.001	0.001	0.000	0.001	0.000	0.001	0.002	0.003	0.000	0.001
Marine eutrophication	kg N eq	0.002	0.002	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Terrestrial ecotoxicity	kg 1,4-DCB	92.079	94.512	31.860	28.278	0.119	2.954	17.115	2.670	7.310	1.185	0.588	3.021
Freshwater ecotoxicity	kg 1,4-DCB	1.133	1.153	0.212	0.330	0.001	0.068	0.031	0.053	0.099	0.334	0.005	0.025
Marine ecotoxicity	kg 1,4-DCB	1.517	1.550	0.293	0.429	0.001	0.089	0.051	0.074	0.136	0.437	0.007	0.040
Human carcinogenic toxicity	kg 1,4-DCB	2.258	2.325	0.468	0.296	0.001	0.263	0.202	0.269	0.470	0.286	0.003	0.070
Human non-carcinogenic toxicity	kg 1,4-DCB	27.081	28.159	5.525	5.792	0.061	1.643	0.984	2.336	3.274	7.333	0.134	1.212
Land use	m2a crop eq	0.382	0.384	0.055	0.095	0.001	0.035	0.049	0.046	0.081	0.005	0.014	0.016
Mineral resource scarcity	kg Cu eq	0.055	0.055	0.013	0.025	0.000	0.005	0.003	0.001	0.005	0.002	0.000	0.000
Fossil resource scarcity	kg oil eq	4.462	4.645	0.310	0.563	0.209	0.791	0.356	0.752	1.379	0.097	0.005	0.188
Water consumption	m3	0.916	0.935	0.180	0.048	0.623	0.019	0.002	0.007	0.031	0.003	0.005	0.023

Table S59: Concentration of ions present in the discharge for the sensitivity analysis. The values are the highest allowed concentration for the plant.

Parameter	Amount	u.m.
Mercury	5	*mg/m3*
Lead	200	*mg/m3*
Arsenic	500	*mg/m3*
Cadmium	20	*mg/m3*
Chromium (VI)	200	*mg/m3*
Nichel	2000	*mg/m3*

Table S60: Results of toxicity contribution analysis in clariflocculation scenarios. Sensitivity analysis.

				Midpoint Human health [cases/kgemitted] (freshwater)		Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater)	Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater) PFAS-ADAPTED	Endpoint Human health [DALY/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted] PFAS-ADAPTED
Technique	**Parameter**	**Amount**	**u.m.**	**Cancer**	**Non-cancer**	**Freshwater**	**Freshwater**	**Total**	**Freshwater**	**Freshwater**
CLARIFLOCCULATION	*PFOA*	18.75	*mg/m3*	2.36E-10	8.77E-08	2.01E-02	1.47E-03	2.39E-07	1.01E-02	7.35E-04
	PFBA	4.90	*mg/m3*			4.30E-04	3.15E-05		2.15E-04	1.58E-05
	PFBS	4.66	*mg/m3*	0.00E+00	8.21E-12	2.73E-03	1.91E-04	2.22E-11	1.37E-03	9.54E-05
	PFHxA	2.29	*mg/m3*	0.00E+00	1.03E-11	6.75E-05	1.16E-05	2.78E-11	3.37E-05	5.82E-06
	Mercury	5.00	*mg/m3*	7.58E-10	8.97E-08	1.10E-01		2.51E-07	5.52E-02	
	Lead	200.00	*mg/m3*	2.87E-11	1.01E-08	1.32E+00		2.75E-08	6.61E-01	
	Arsenic	500.00	*mg/m3*	1.71E-07	1.26E-05	1.39E+01		3.61E-05	6.93E+00	
	Cadmium	20.00	*mg/m3*	3.49E-10	9.37E-08	4.19E+01		2.57E-07	2.09E+01	
	Chromium (VI)	200.00	*mg/m3*	1.98E-06	4.46E-09	2.09E+01		2.28E-05	1.04E+01	
	Nichel	2000.00	*mg/m3*	2.38E-07	1.34E-08	3.63E+02		2.77E-06	1.82E+02	
	Process, INC	1000	*kg*	4.24E-06	1.67E-05	9.82E+04		9.37E-05	4.91E+04	
	Process, LAND	1000	*kg*	3.89E-06	1.67E-05	1.08E+05		8.99E-05	5.41E+04	

Table S61: Results of toxicity contribution analysis in PAC SS scenarios.Sensitivity analysis.

				Midpoint Human health [cases/kgemitted] (freshwater)		Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater)	Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater) PFAS-ADAPTED	Endpoint Human health [DALY/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted] PFAS-ADAPTED
Technique	**Parameter**	**Amount**	**u.m.**	**Cancer**	**Non-cancer**	**Freshwater**	**Freshwater**	**Total**	**Freshwater**	**Freshwater**
7,3 g/l PAC (ss)	*PFOA*	8.38	*mg/m3*	1.05E-10	3.92E-08	8.99E-03	6.58E-04	1.07E-07	4.49E-03	3.29E-04
	PFBA	2.19	*mg/m3*			1.92E-04	1.41E-05		9.61E-05	7.05E-06
	PFBS	2.08	*mg/m3*	0.00E+00	3.67E-12	1.22E-03	8.53E-05	9.91E-12	6.11E-04	4.27E-05
	PFHxA	1.02	*mg/m3*	0.00E+00	4.61E-12	3.02E-05	5.20E-06	1.24E-11	1.51E-05	2.60E-06
	Mercury	5.00	*mg/m3*	7.58E-10	8.97E-08	1.10E-01		2.51E-07	5.52E-02	
	Lead	200.00	*mg/m3*	2.87E-11	1.01E-08	1.32E+00		2.75E-08	6.61E-01	
	Arsenic	500.00	*mg/m3*	1.71E-07	1.26E-05	1.39E+01		3.61E-05	6.93E+00	
	Cadmium	20.00	*mg/m3*	3.49E-10	9.37E-08	4.19E+01		2.57E-07	2.09E+01	
	Chromium (VI)	200.00	*mg/m3*	1.98E-06	4.46E-09	2.09E+01		2.28E-05	1.04E+01	
	Nichel	2000.00	*mg/m3*	2.38E-07	1.34E-08	3.63E+02		2.77E-06	1.82E+02	
	Process, INC	1000	*kg*	7.74E-06	2.17E-05	2.31E+05		1.48E-04	1.16E+05	
	Process, LAND	1000	*kg*	7.05E-06	2.18E-05	2.51E+05		1.40E-04	1.26E+05	
Technique	**Parameter**	**Amount**	**u.m.**							
17 g/l PAC (ss)	*PFOA*	1.79	*mg/m3*	2.26E-11	8.39E-09	1.92E-03	1.41E-04	2.29E-08	9.62E-04	7.04E-05
	PFBA	0.47	*mg/m3*			4.11E-05	3.02E-06		2.06E-05	1.51E-06
	PFBS	0.45	*mg/m3*	0.00E+00	7.86E-13	2.62E-04	1.83E-05	2.12E-12	1.31E-04	9.13E-06
	PFHxA	0.22	*mg/m3*	0.00E+00	9.87E-13	6.46E-06	1.11E-06	2.66E-12	3.23E-06	5.57E-07
	Mercury	5.00	*mg/m3*	7.58E-10	8.97E-08	1.10E-01		2.51E-07	5.52E-02	
	Lead	200.00	*mg/m3*	2.87E-11	1.01E-08	1.32E+00		2.75E-08	6.61E-01	
	Arsenic	500.00	*mg/m3*	1.71E-07	1.26E-05	1.39E+01		3.61E-05	6.93E+00	
	Cadmium	20.00	*mg/m3*	3.49E-10	9.37E-08	4.19E+01		2.57E-07	2.09E+01	
	Chromium (VI)	200.00	*mg/m3*	1.98E-06	4.46E-09	2.09E+01		2.28E-05	1.04E+01	
	Nichel	2000.00	*mg/m3*	2.38E-07	1.34E-08	3.63E+02		2.77E-06	1.82E+02	
	Process, INC	1000	*kg*	1.29E-05	2.91E-05	4.32E+05		2.26E-04	2.16E+05	
	Process, LAND	1000	*kg*	1.13E-05	2.93E-05	4.75E+05		2.10E-04	2.38E+05	
Technique	**Parameter**	**Amount**	**u.m.**							
33 g/l PAC (ss)	*PFOA*	0.26	*mg/m3*	3.27E-12	1.21E-09	2.79E-04	2.04E-05	3.32E-09	1.39E-04	1.02E-05
	PFBA	0.07	*mg/m3*			5.95E-06	4.37E-07		2.98E-06	2.18E-07
	PFBS	0.06	*mg/m3*	0.00E+00	1.14E-13	3.79E-05	2.64E-06	3.07E-13	1.89E-05	1.32E-06
	PFHxA	0.03	*mg/m3*	0.00E+00	1.43E-13	9.35E-07	1.61E-07	3.86E-13	4.67E-07	8.06E-08
	Mercury	5.00	*mg/m3*	7.58E-10	8.97E-08	1.10E-01		2.51E-07	5.52E-02	
	Lead	200.00	*mg/m3*	2.87E-11	1.01E-08	1.32E+00		2.75E-08	6.61E-01	
	Arsenic	500.00	*mg/m3*	1.71E-07	1.26E-05	1.39E+01		3.61E-05	6.93E+00	
	Cadmium	20.00	*mg/m3*	3.49E-10	9.37E-08	4.19E+01		2.57E-07	2.09E+01	
	Chromium (VI)	200.00	*mg/m3*	1.98E-06	4.46E-09	2.09E+01		2.28E-05	1.04E+01	
	Nichel	2000.00	*mg/m3*	2.38E-07	1.34E-08	3.63E+02		2.77E-06	1.82E+02	
	Process, INC	1000	*kg*	2.13E-05	4.12E-05	7.62E+05		3.56E-04	3.81E+05	
	Process, LAND	1000	*kg*	1.84E-05	4.16E-05	8.43E+05		3.24E-04	4.21E+05	

Table S62: Results of toxicity contribution analysis in PAC DS scenarios. Sensitivity analysis.

				Midpoint Human health [cases/kgemitted] (freshwater)		Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater)	Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater) PFAS-ADAPTED	Endpoint Human health [DALY/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted] PFAS-ADAPTED
Technique	**Parameter**	**Amount**	**u.m.**	**Cancer**	**Non-cancer**	**Freshwater**	**Freshwater**	**Total**	**Freshwater**	**Freshwater**
3,3 g/l PAC (ds)	*PFOA*	13.15	*mg/m3*	1.65E-10	6.15E-08	1.41E-02	1.03E-03	1.68E-07	7.05E-03	5.16E-04
	PFBA	3.44	*mg/m3*			3.01E-04	2.21E-05		1.51E-04	1.11E-05
	PFBS	3.27	*mg/m3*	0.00E+00	5.76E-12	1.92E-03	1.34E-04	1.56E-11	9.59E-04	6.69E-05
	PFHxA	1.61	*mg/m3*	0.00E+00	7.23E-12	4.73E-05	8.17E-06	1.95E-11	2.37E-05	4.08E-06
	Mercury	5.00	*mg/m3*	7.58E-10	8.97E-08	1.10E-01		2.51E-07	5.52E-02	
	Lead	200.00	*mg/m3*	2.87E-11	1.01E-08	1.32E+00		2.75E-08	6.61E-01	
	Arsenic	500.00	*mg/m3*	1.71E-07	1.26E-05	1.39E+01		3.61E-05	6.93E+00	
	Cadmium	20.00	*mg/m3*	3.49E-10	9.37E-08	4.19E+01		2.57E-07	2.09E+01	
	Chromium (VI)	200.00	*mg/m3*	1.98E-06	4.46E-09	2.09E+01		2.28E-05	1.04E+01	
	Nichel	2000.00	*mg/m3*	2.38E-07	1.34E-08	3.63E+02		2.77E-06	1.82E+02	
	Process, INC	1000	*kg*	4.63E-06	1.72E-05	1.08E+05		9.96E-05	5.42E+04	
	Process, LAND	1000	*kg*	4.28E-06	1.72E-05	1.18E+05		9.57E-05	5.92E+04	
Technique	**Parameter**	**Amount**	**u.m.**							
5 g/l PAC (ds)	*PFOA*	11.07	*mg/m3*	1.39E-10	5.18E-08	1.19E-02	8.69E-04	1.41E-07	5.94E-03	4.34E-04
	PFBA	2.89	*mg/m3*			2.54E-04	1.86E-05		1.27E-04	9.32E-06
	PFBS	2.75	*mg/m3*	0.00E+00	4.85E-12	1.61E-03	1.13E-04	1.31E-11	8.07E-04	5.64E-05
	PFHxA	1.35	*mg/m3*	0.00E+00	6.09E-12	3.99E-05	6.88E-06	1.64E-11	1.99E-05	3.44E-06
	Mercury	5.00	*mg/m3*	7.58E-10	8.97E-08	1.10E-01		2.51E-07	5.52E-02	
	Lead	200.00	*mg/m3*	2.87E-11	1.01E-08	1.32E+00		2.75E-08	6.61E-01	
	Arsenic	500.00	*mg/m3*	1.71E-07	1.26E-05	1.39E+01		3.61E-05	6.93E+00	
	Cadmium	20.00	*mg/m3*	3.49E-10	9.37E-08	4.19E+01		2.57E-07	2.09E+01	
	Chromium (VI)	200.00	*mg/m3*	1.98E-06	4.46E-09	2.09E+01		2.28E-05	1.04E+01	
	Nichel	2000.00	*mg/m3*	2.38E-07	1.34E-08	3.63E+02		2.77E-06	1.82E+02	
	Process, INC	1000	*kg*	4.83E-06	1.74E-05	1.14E+05		1.03E-04	5.68E+04	
	Process, LAND	1000	*kg*	4.48E-06	1.75E-05	1.24E+05		9.88E-05	6.18E+04	
Technique	**Parameter**	**Amount**	**u.m.**							
7,3 g/l PAC (ds)	*PFOA*	7.04	*mg/m3*	8.85E-11	3.29E-08	7.55E-03	5.52E-04	8.99E-08	3.77E-03	2.76E-04
	PFBA	1.84	*mg/m3*			1.61E-04	1.18E-05		8.06E-05	5.92E-06
	PFBS	1.75	*mg/m3*	0.00E+00	3.08E-12	1.03E-03	7.16E-05	8.32E-12	5.13E-04	3.58E-05
	PFHxA	0.86	*mg/m3*	0.00E+00	3.87E-12	2.53E-05	4.37E-06	1.04E-11	1.27E-05	2.18E-06
	Mercury	5.00	*mg/m3*	7.58E-10	8.97E-08	1.10E-01		2.51E-07	5.52E-02	
	Lead	200.00	*mg/m3*	2.87E-11	1.01E-08	1.32E+00		2.75E-08	6.61E-01	
	Arsenic	500.00	*mg/m3*	1.71E-07	1.26E-05	1.39E+01		3.61E-05	6.93E+00	
	Cadmium	20.00	*mg/m3*	3.49E-10	9.37E-08	4.19E+01		2.57E-07	2.09E+01	
	Chromium (VI)	200.00	*mg/m3*	1.98E-06	4.46E-09	2.09E+01		2.28E-05	1.04E+01	
	Nichel	2000.00	*mg/m3*	2.38E-07	1.34E-08	3.63E+02		2.77E-06	1.82E+02	
	Process, INC	1000	*kg*	5.10E-06	1.78E-05	1.21E+05		1.07E-04	6.04E+04	
	Process, LAND	1000	*kg*	4.76E-06	1.78E-05	1.31E+05		1.03E-04	6.53E+04	
Technique	**Parameter**	**Amount**	**u.m.**							
8,7 g/l PAC (ds)	*PFOA*	4.20	*mg/m3*	5.29E-11	1.97E-08	4.51E-03	3.30E-04	5.37E-08	2.25E-03	1.65E-04
	PFBA	1.10	*mg/m3*			9.63E-05	7.07E-06		4.82E-05	3.54E-06
	PFBS	1.05	*mg/m3*	0.00E+00	1.84E-12	6.13E-04	4.28E-05	4.97E-12	3.06E-04	2.14E-05
	PFHxA	0.51	*mg/m3*	0.00E+00	2.31E-12	1.51E-05	2.61E-06	6.24E-12	7.56E-06	1.30E-06
	Mercury	5.00	*mg/m3*	7.58E-10	8.97E-08	1.10E-01		2.51E-07	5.52E-02	
	Lead	200.00	*mg/m3*	2.87E-11	1.01E-08	1.32E+00		2.75E-08	6.61E-01	
	Arsenic	500.00	*mg/m3*	1.71E-07	1.26E-05	1.39E+01		3.61E-05	6.93E+00	
	Cadmium	20.00	*mg/m3*	3.49E-10	9.37E-08	4.19E+01		2.57E-07	2.09E+01	
	Chromium (VI)	200.00	*mg/m3*	1.98E-06	4.46E-09	2.09E+01		2.28E-05	1.04E+01	
	Nichel	2000.00	*mg/m3*	2.38E-07	1.34E-08	3.63E+02		2.77E-06	1.82E+02	
	Process, INC	1000	*kg*	5.27E-06	1.80E-05	1.25E+05		1.09E-04	6.25E+04	
	Process, LAND	1000	*kg*	4.92E-06	1.81E-05	1.35E+05		1.05E-04	6.75E+04	

Table S63: Results of toxicity contribution analysis in Fenton scenarios. Sensitivity analysis.

				Midpoint Human health [cases/kgemitted] (freshwater)		Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater)	Midpoint Ecotox. [PAF.m3.day/kgemitted] (freshwater) PFAS-ADAPTED	Endpoint Human health [DALY/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted]	Endpoint Ecotox. [PDF.m3.day/kgemitted] PFAS-ADAPTED
Technique	**Parameter**	**Amount**	**u.m.**	**Cancer**	**Non-cancer**	**Freshwater**	**Freshwater**	**Total**	**Freshwater**	**Freshwater**
Fenton	*PFOA*	8.90	*mg/m3*	1.12E-10	4.16E-08	9.55E-03	6.98E-04	1.14E-07	4.77E-03	3.49E-04
	PFBA	2.33	*mg/m3*			2.04E-04	1.50E-05		1.02E-04	7.49E-06
	PFBS	2.21	*mg/m3*	0.00E+00	3.90E-12	1.30E-03	9.06E-05	1.05E-11	6.49E-04	4.53E-05
	PFHxA	1.09	*mg/m3*	0.00E+00	4.89E-12	3.20E-05	5.53E-06	1.32E-11	1.60E-05	2.76E-06
	Mercury	5.00	*mg/m3*	7.58E-10	8.97E-08	1.10E-01		2.51E-07	5.52E-02	
	Lead	200.00	*mg/m3*	2.87E-11	1.01E-08	1.32E+00		2.75E-08	6.61E-01	
	Arsenic	500.00	*mg/m3*	1.71E-07	1.26E-05	1.39E+01		3.61E-05	6.93E+00	
	Cadmium	20.00	*mg/m3*	3.49E-10	9.37E-08	4.19E+01		2.57E-07	2.09E+01	
	Chromium (VI)	200.00	*mg/m3*	1.98E-06	4.46E-09	2.09E+01		2.28E-05	1.04E+01	
	Nichel	2000.00	*mg/m3*	2.38E-07	1.34E-08	3.63E+02		2.77E-06	1.82E+02	
	Process, INC	1000	*kg*	1.23E-05	2.25E-05	3.11E+05		2.03E-04	1.56E+05	
	Process, LAND	1000	*kg*	1.04E-05	2.28E-05	3.68E+05		1.81E-04	1.84E+05	