Supplementary Material for "LungDepo: Modelling the regional particle deposition in the human lung via the Enalos Cloud Platform"

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S1. REST APIs

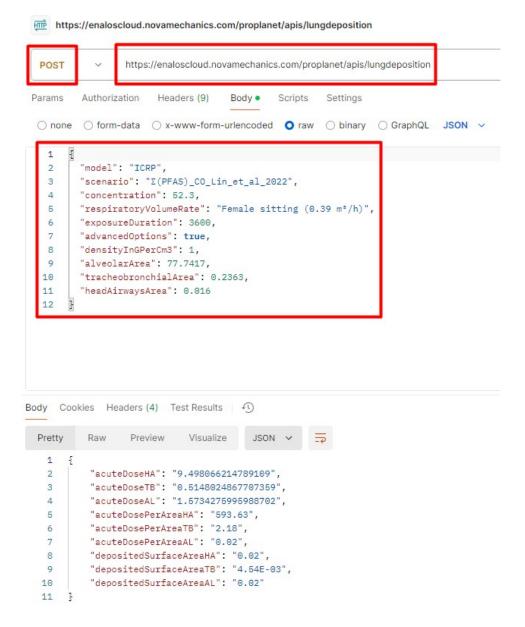
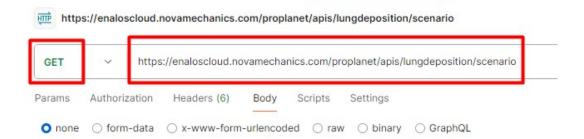


Figure S1. Using Postman to test the functionality of a 'POST' request for the endpoint <u>https://enaloscloud.novamechanics.com/proplanet/apis/lungdeposition</u>, including input data and response validation.

POST	/lungdeposition			
Paramete	S			ancel
Name	Description			
body object (body)	Edit Value Model			
	<pre>{ "model: "ICRP", "scenario": "ICRP", "concentration": 52.3, "concentration": 52.3, "concentration": Mode, "advancedoptions": Mode, "advancedoptions": true, "densityIngPercm3": 1, "alveolariarea": 77.7417, "trachebornchialarea": 0.2363, "headdiruaysArea": 0.016 } </pre>			
	Cancel Parameter content type application/json			~
	Execute	Clear		
			C	
Response	5	Response content type	application/json	~
Request UF	вт "https://enaloscloud.novamechanics.com/proplanet/apis/lungdeposition" -Н "accept: application/json" -Н "Content-Type: application/json	" -d "{ \"model\": \"IG	:RP\", \"scenario\": \"£(i	FAS)_CO_L
https://o	naloscloud.novamechanics.com/proplanet/apis/lungdeposition		_	
-	t naloscloud.novamechanics.com/proplanet/apis/lungdeposition			
Server resp	L naloscloud.novamechanics.com/proplanet/apis/lungdeposition onse			
Server resp Code	t naloscloud.novamechanics.com/proplanet/apis/lungdeposition onse Details		B De	wnload
Server resp Code	t naloscloud.novamechanics.com/proplanet/apis/lungdeposition Details Response body { "acutetosetH1": "9.498066214783109", "acutetosetH2": "9.498066214783109", "acutetosetH2": "9.498066214783109", "acutetosetH2": "9.49807467797355", "acutetosetH2": "9.4980747797355", "acutetosetH2": "9.4980747797355", "acutetosetH2": "9.49807477775755 "acutetosetH2": "9.4980747777575777575 "acutetosetH2": "9.49807777757777777777777777777777777777777		a	wnload

Figure S2. Using Swagger to perform a /lungdeposition POST request, including input data and response validation.



dy Coo	okies Headers (4) Test Results
Pretty	Raw Preview Visualize JSON 🗸 异
1 [
2	"Σ(PFAS)_C0_Lin_et_al_2022",
3	"Σ(PFAS)_LA_Lin_et_al_2022",
4	"Σ(PFAS)_MP_Lin_et_al_2022",
5	"Σ(PFAS)_SW1_Lin_et_al_2022",
6	"Σ(PFAS)_SW2_Lin_et_al_2022",
7	"Σ(PFAS)_SW3_Lin_et_al_2022",
8	"PFBA_CO_Lin_et_al_2022",
9	"PFBA_LA_Lin_et_al_2022",
10	"PFBA_MP_Lin_et_al_2022",
11	"PFBA_SW1_Lin_et_al_2022",
12	"PFBA_SW2_Lin_et_al_2022",
13	"PFBA_SW3_Lin_et_al_2022",
14	"PFBS_CO_Lin_et_al_2022",
15	"PFBS_LA_Lin_et_al_2022",
16	"PFBS_MP_Lin_et_al_2022",
17	"PFBS_SW1_Lin_et_al_2022",
18	"PFBS_SW2_Lin_et_al_2022",
19	"PFBS_SW3_Lin_et_al_2022",
20	"Corn_Starch_Fuentes_et_al_2022",
21	"Chitosan_Patil_and_Sawant_2011",
22	"Glycerol_Guzman_2024",
23	"ZnO_Monse_et_al_2021",
24	"Acetic_Acid_Zhang_et_al_2019",
25	"Silane_based_Motzkus_et_al_2011",
26	"Siloxane_based_McDonagh_and_Byrne_2014",
27	"2-Octenylsuccinic_anhydride_Wang_et_al_2020",
28	"Sodium_alginate_Santa-Maria_et_al_2012",
29	"AKD_Werner_and_Turner_2012",
30	"PAH_PHE_Lv_et_al_2016",
31	"PAH_BaA_Lv_et_al_2016",
32	"PAH_BbF_Lv_et_al_2016",
33	"PAH_IPY_Lv_et_al_2016",
34	"custom"
35]	

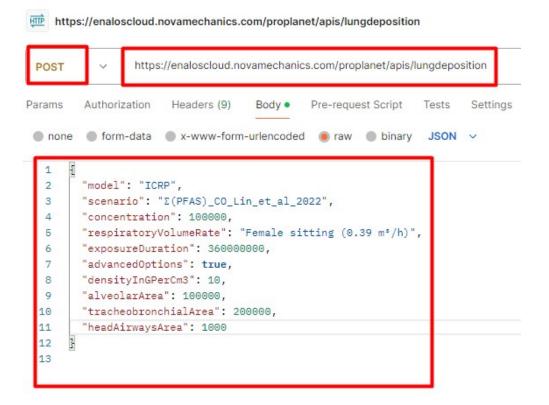
Figure S3. Using Postman to test the functionality of a 'GET' request for the endpoint <u>https://enaloscloud.novamechanics.com/proplanet/apis/lungdeposition/scenario</u>, verifying the request parameters and the expected response.

GET	~	https://enaloscloud.r	ovamecha	nics.com/p	roplanet/apis/lung	deposition/respiratoryVolumeRate
Params Query Par	Authoriza	ition Headers (6)	Body	Scripts	Settings	
	Key					Value
	Key Key					Value

Pretty	Raw	Preview	Visualize	JSON	~	=
1	C					
2	"Femal	le sitting	(0.39 m ^s /h)	,		
3	"Femal	le light e	xercise (1.2	5 m³/h)"		
4	"Femal	Le heavy e	xercise (2.70	9 m³/h)"	,	
5	"Male	sitting (0.54 m ^s /h)",			
6	"Male	light exe	rcise (1.50 m	m° <u>/h)</u> ",		
6 7	"Male	heavy exe	rcise (3.00 m	m⁵/h)"		
8	1					

Figure S4. Using Postman to test the functionality of a 'GET' request for the endpoint <u>https://enaloscloud.novamechanics.com/proplanet/apis/lungdeposition/respiratoryVolumeRate</u>, verifying the request parameters and the expected response.

S2. API robustness tests



ody Coo	kies Head	ders (4) Te	est Results			
Pretty	Raw	Preview	Visualize	JSON	~	
1 {						
2	"acuteD	oseHA": "	1.816073846	0399828E	9",	
3	"acuteD	oseTB": "	9.843259785	29132E7"	,	
4	"acuteD	oseAL": "	3.008465773	611608E8	",	
5	"acuteD	osePerAre	aHA": "1.82	E+06",		
6	"acuteD	osePerAre	aTB": "492.:	16",		
7	"acuteD	osePerAre	aAL": "3,000	8.47",		
8	"deposi	tedSurfac	eAreaHA": "	443,356.	89",	
9	"deposi	tedSurfac	eAreaTB": "	86,835.5	7",	
10	"deposi	tedSurfac	eAreaAL": "	454,019.	45"	
11						

Figure S5. Using Postman to test the functionality of a 'POST' request for the endpoint <u>https://enaloscloud.novamechanics.com/proplanet/apis/lungdeposition</u>, including extremely high input data using the International Commission on Radiological Protection (ICRP) model and the response validation.

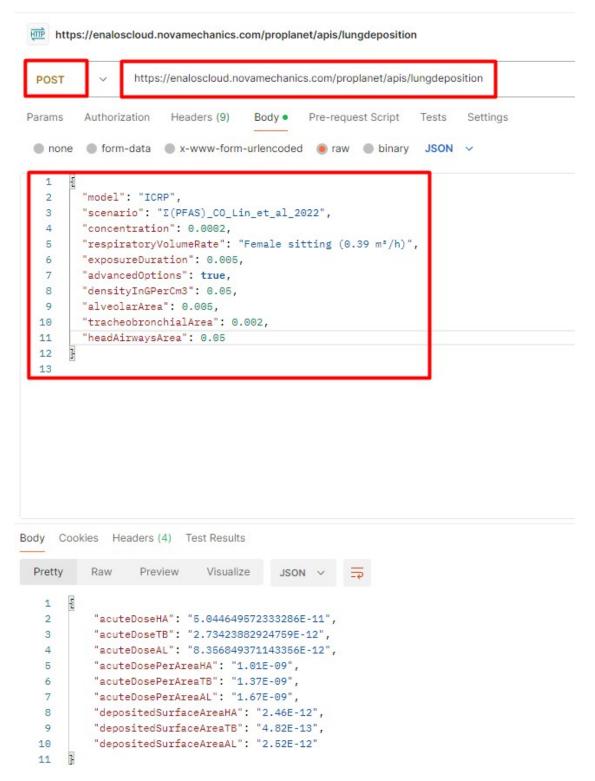


Figure S6. Using Postman to test the functionality of a 'POST' request for the endpoint

https://enaloscloud.novamechanics.com/proplanet/apis/lungdeposition, including extremely low input data using the ICRP model and the response validation.

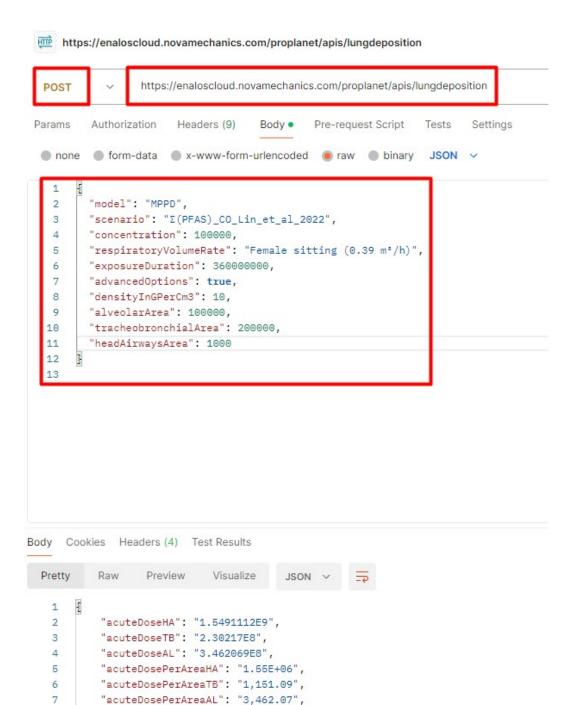


Figure S7. Using Postman to test the functionality of a 'POST' request for the endpoint <u>https://enaloscloud.novamechanics.com/proplanet/apis/lungdeposition</u>, including extremely high input data using the Multiple-Path Particle Dosimetry (MPPD) model and the response validation.

"depositedSurfaceAreaHA": "249,293.87",

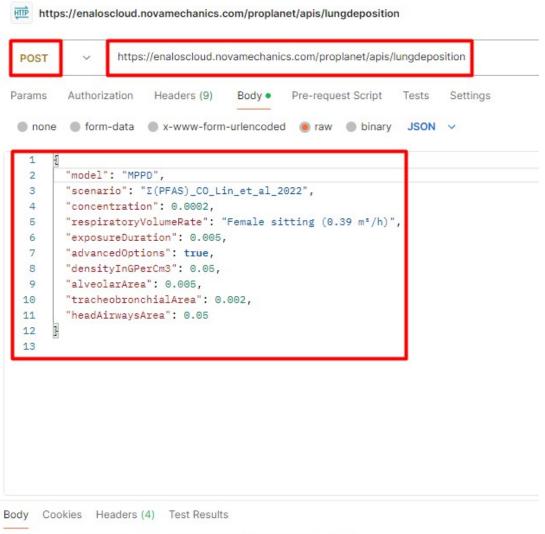
"depositedSurfaceAreaTB": "327,931.82",

"depositedSurfaceAreaAL": "521,367.39"

8 9

10

11 }



Pretty	Raw	Preview	Visualize	JSON V	=
1 {					
2	"acut	eDoseHA": "	4.303086666	666668E-11",	
3	"acut	eDoseTB": "	6.394916666	666667E-12",	
4	"acut	eDoseAL": "	9.616858333	333334E-12",	
5	"acut	eDosePerAre	eaHA": "8.61	E-10",	
6	"acut	eDosePerAre	eaTB": "3.20	E-09",	
7	"acut	eDosePerAre	eaAL": "1.92	E-09",	
8	"depo	sitedSurfac	eAreaHA": "	1.38E-12",	
9	"depo	sitedSurfac	eAreaTB": "	1.82E-12",	
10	"depo	sitedSurfac	eAreaAL": "	2.90E-12"	
11 }					

Figure S8. Using Postman to test the functionality of a 'POST' request for the endpoint

https://enaloscloud.novamechanics.com/proplanet/apis/lungdeposition, including extremely low input data using the MPPD model and response validation.

S3. *LungDepo* results regarding mass deposited (%)

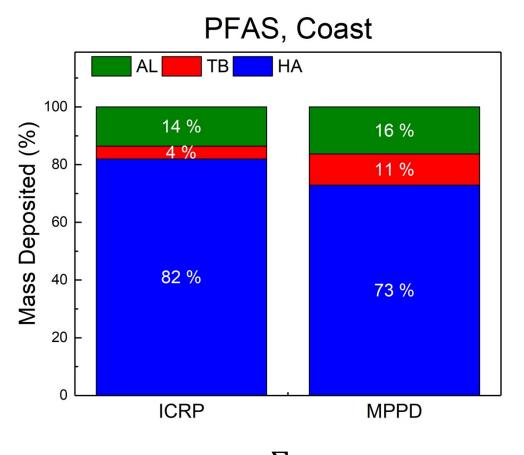


Figure S9. Prediction of the mass deposition measured in % of $\sum PFAS$ at coastal site as computed using the ICRP and MPPD models integrated within the *LungDepo* web application.

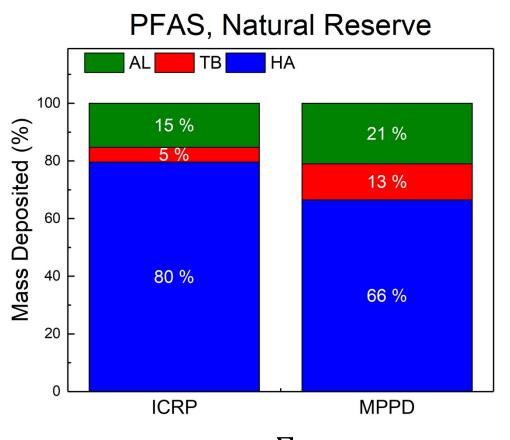


Figure S10. Prediction of the mass deposition measured in % of $\sum PFAS$ at natural reserve site as computed using the ICRP and MPPD models integrated within the *LungDepo* web application.

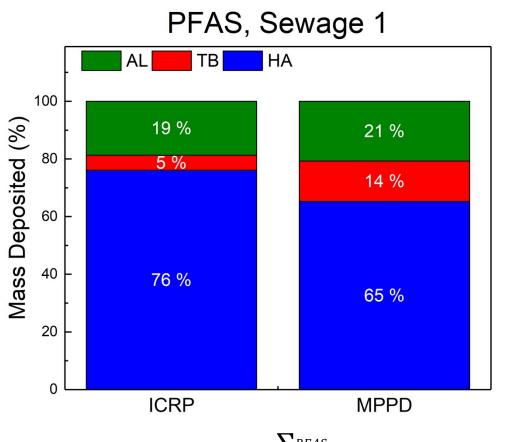


Figure S11. Prediction of the mass deposition measured in % of $\sum PFAS$ at sewage 1 site as computed using the ICRP and MPPD models integrated within the *LungDepo* web application.

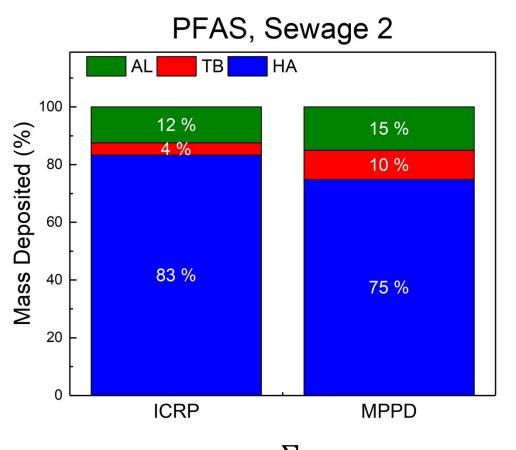


Figure S12. Prediction of the mass deposition measured in % of $\sum_{at sewage 2 site as computed using the ICRP and MPPD models integrated within the$ *LungDepo*web application.

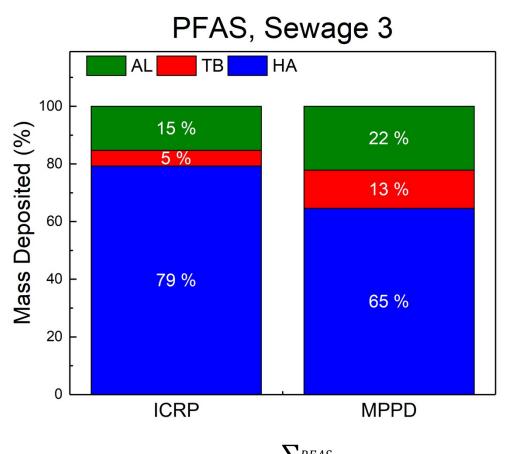


Figure S13. Prediction of the mass deposition measured in % of $\sum PFAS$ at sewage 3 site as computed using the ICRP and MPPD models integrated within the *LungDepo* web application.

S4. LungDepo results regarding particle size deposited (%)

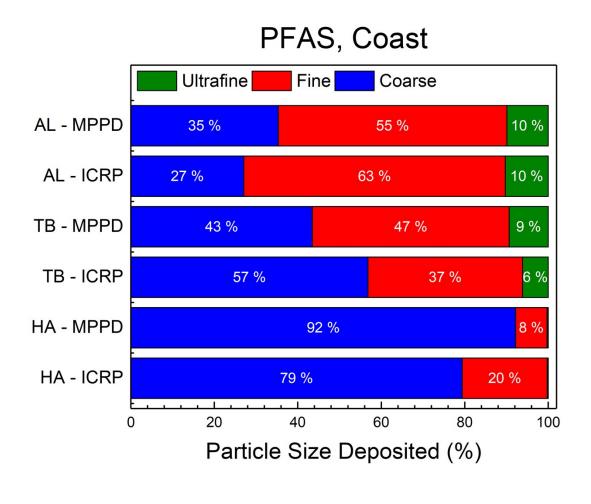
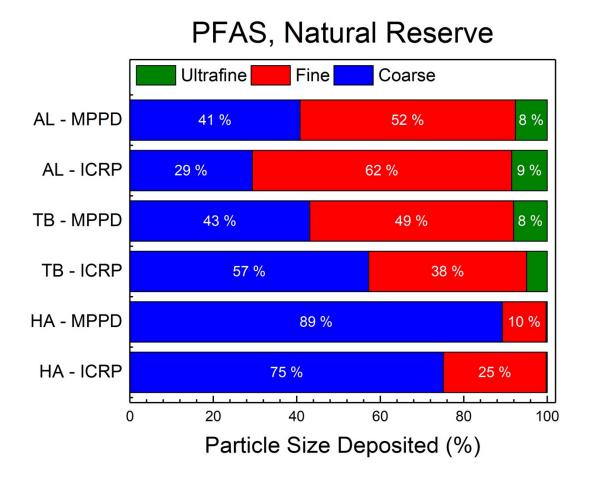


Figure S14. Contributions (expressed as percentages) of inhaled $\sum_{associated with particles of different sizes (at a coastal site) as calculated using the ICRP and MPPD models integrated within the$ *LungDepo*web application.





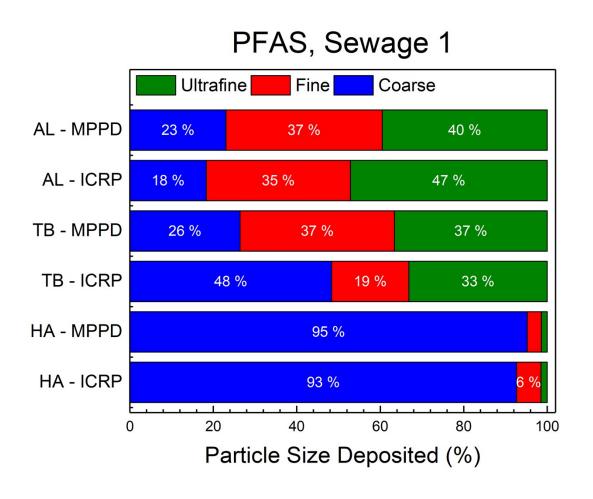


Figure S16. Contributions (expressed as percentages) of inhaled $\sum_{1 \text{ site}} PFAS$ associated with particles of different sizes (at sewage 1 site) as calculated using the ICRP and MPPD models integrated within the *LungDepo* web application.

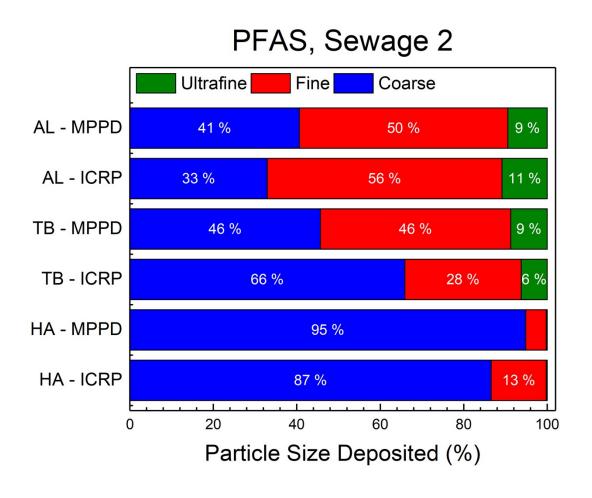


Figure S17. Contributions (expressed as percentages) of inhaled $\sum_{2 \text{ site}} PFAS$ associated with particles of different sizes (at sewage 2 site) as calculated using the ICRP and MPPD models integrated within the *LungDepo* web application.

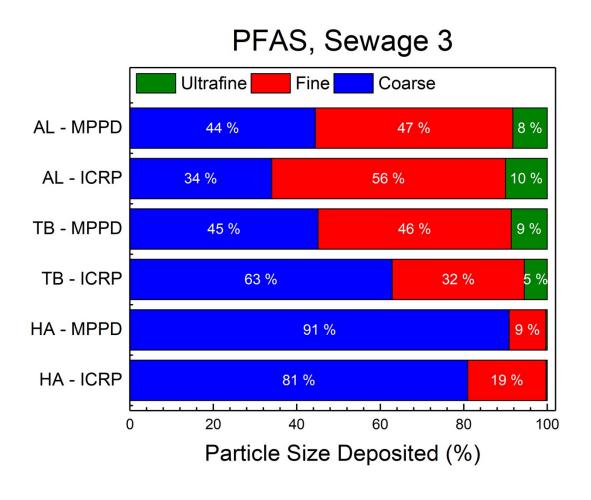


Figure S18. Contributions (expressed as percentages) of inhaled $\sum PFAS$ associated with particles of different sizes (at sewage 3 site) as calculated using the ICRP and MPPD models integrated within the *LungDepo* web application.