

Attachment 8

Laboratory Assessment 2025-2026 and Earlier

Attachment 8: Laboratory Assessment 2025-2026 and Earlier

NCEH MASTER LIST OF ANALYTES TABLE LEGEND	
	Empty cell indicates that the analyte was not measured or reported to NCHS during that cycle
●	Measured during cycle and reported to NCHS via data file submission, or measurement is planned for future NHANES survey
P	Sample was pooled during cycle
Surplus	Measurement of analyte originally planned for regular NHANES but later converted to surplus sample request during cycle, per NCHS
& Surplus	Table data published in exposure report as regular sample and as surplus sample (updated data, children only data, etc.)
NO PRBC	No Packed Red Blood Cells (PRBC) available during cycle
C	Measuring is contingent upon funding and other resources during cycle
X1	Measured but not reported, as MECs were contaminated with those analytes
WD	Analyte/chemical originally intended to be measured and withdrawn during cycle; please follow up with branch for description
D	Dropped during cycle/cycled out; unless otherwise stated, most common reason is no detection
DEV	Method in development during cycle
Strikethrough	Analyte methodology discontinued/dropped for methods issues; included in table for archival purposes
x	Was not approved by NCHS
♀	Female
♂	Male
{Analyte} Isomer	Refer to one of the isomer associated with specified analyte

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26			
Formaldehyde	PRBC	Full set, then 1/3	Full set, then 1/2	NO PRBC	•	•	D	D	D				
Acrylamide					•	•	D	D	D				
Glycidamide					•	•	D	D	D				
Ethylene Oxide					•	•	•	•	D				
Acrylonitrile		1/3 of 6+	1/2 of 5+						•				
Sex Steroid Hormones (Reproductive Hormones)													
Estradiol, Total (E2)	Serum	Proposed 6+, only this Analyte 2-4	Proposed: 5+, only this Analyte 2-4		•	•	Surplus	•	•				
Steroid Hormone–Binding Globulin (SHBG)					•	•	Surplus	•	•				
Testosterone, Total (TT)				•	•	•	x	•	•				
17α-Hydroxyprogesterone (17-OHP) / Hydroxyprogesterone							Surplus	•	•				
Progesterone (P4)							Surplus	•	•				
Estrone (E1)							Surplus	•	•				
Estrone sulfate (E1S)							Surplus	•	•				
Androstenedione (AD)							Surplus	•	•				
Dehydroepiandrosterone sulfate (DHEAS)					x	•	•						
Anti-Müllerian hormone (AMH)		♀ 6+	, ♀ 5+					Surplus	•	•			
Follicle-stimulating hormone (FSH)		6+	5+					Surplus	•	•			
Luteinizing hormone (LH)								Surplus	•	•			
Trans Fatty Acids													
trans-9-Hexadecenoic acid	Plasma	1/3 of 3+	1/2 of 3+	D					•				
trans-9-Octadecenoic acid				D						•			
trans,trans-9,12-Octadecadienoic acid				D							•		
trans-11-Octadecanoic acid				D							•		
Thyroid Function													
Free thyroxine (FT4)	Serum	N/A	TBA							•			
Total thyroxine (TF4)												•	
Thyroid peroxidase antibodies													•
Thyroglobulin antibodies													•
Thyroid-stimulating hormone (TSH)													•
(TSH) receptor antibodies													•

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
Thyroglobulin *										C	
Free T3 * -Triiodothyronine										C	
Total T3 * -Triiodothyronine										•	
Fructose (CT)										•	
Cholinesterase Assays in Blood and Serum											
RBC Acetylcholinesterase activity (AChE activity)	Whole Blood	Full Set, 6+	Full Set, 5+					x	•		
Butyrylcholinesterase activity (BChE activity)	Serum									•	•
Butyrylcholinesterase concentration (BChE)										•	•
Chlorinated Tyrosines											
Serum 3-chlorotyrosine	Serum	6+	5+			•		x			
Serum 3,5-dichlorotyrosine						•					
Metals and Metalloids											
Antimony	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 of 5+	•	•	•	•	•	•	•	
Arsenic (total)				•	•	•	•	•	•	•	•
Arsenic (V) acid				•	•	•	•	•	•	•	•
Arsenobetaine				•	•	•	•	•	•	•	•
Arsenocholine				•	•	•	•	•	•	•	•
Arsenous (III) acid				•	•	•	•	•	•	•	•
Dimethylarsinic acid				•	•	•	•	•	•	•	•
Monomethylarsonic acid				•	•	•	•	•	•	•	•
Trimethylarsine oxide				•			D				
Barium				•	•	•	•	•	•	•	•
Beryllium				D							
Cadmium	Whole Blood	Full; 1/2 (13-14)	1+	•	•	•	•	•	•		
Cadmium	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 of 5+	•	•	•	•	•	•	•	
Cesium				•	•	•	•	•	•	•	
Chromium								•	•	•	
Chromium	Whole Blood	40+	1+			•	•	D			
Cobalt						•	•	D			

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle < 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Cobalt	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 of 5+	•	•	•+	•	•	•	•
Copper	Serum	1/3 of 12+	1/2 of 12+	•	•	•	D			
Lead	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 of 5+	•	•	•+	•	•	•	•
Lead	Whole Blood	Full; 1/2 (13-14)	Full; 1+	•	•	•	•	•	•	•
Manganese		Full; 1/2 (13-14)	1+	•	•	•	•	•	•	•
Manganese	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 5+	•	•	•	•	•	•	
Mercury (total)	Whole Blood	Full; 1/2 (13-14)	1+	•	•	•	•	•	•	•
Mercury (inorganic)	Urine			•	•	•	•	•	•	•
Mercury (ethyl)				•	•	•	•	•	•	•
Mercury (methyl)				•	•	•	•	•	•	•
Mercury		3-5 & 1/3 of 6+	3-4 & 1/2 of 5+	•	•	•	•	•	•	•
Molybdenum				•	•	•	•	•	•	•
Nickel								•	•	•
Platinum					D					
Selenium	Whole Blood	Full; 1/2 (13-14)	Full; 1/2 (13-14)	•	•	•	•	•	•	•
Selenium	Serum	1/3 of 12+	1/2 of 12+	•	•	•	D			
Strontium	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 of 5+	•	•	•	•	•	•	•
Thallium				•	•	•	•	•	•	•
Tin				•	•	•	•	•	•	•
Tungsten				•	•	•	•	•	•	•
Uranium					•	•	•	•	•	•
Zinc	Serum	1/3 of 12+	1/2 of 12+	•	•	•	D			
Iodine	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 of 5+	•	•	•	•	•	•	•
Iodine	Salt							•	D	
Iodine	Salt							•	D	

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle < 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26		
Fluoride		Water	0-19 & MEC examined	0-17 & MEC examined					•	D			
Fluoride		Urine	6-19	5-19		•	•	D					
Caffeine and Metabolites													
5-acetylamino-6-amino-3-methyluracil		Urine	6+	N/A	•	•	D						
1-methyluric acid					•	•	D						
3-methyluric acid					•	•	D						
7-methyluric acid					•	•	D						
1,3-dimethyluric acid					•	•	D						
1,7-dimethyluric acid					•	•	D						
3,7-dimethyluric acid					•	•	D						
1,3,7-trimethyluric acid					•	•	D						
1-methylxanthine					•	•	D						
3-methylxanthine					•	•	D						
7-methylxanthine					•	•	D						
1,3-dimethylxanthine (theophylline)					•	•	D						
1,7-dimethylxanthine (paraxanthine)					•	•	D						
3,7-dimethylxanthine (theobromine)					•	•	D						
1,3,7-trimethylxanthine (caffeine)		•	•	D									
Fatty acids (30)													
Capric acid (C10:0)		Plasma /Serum	NH11-14 3+ & 12+ fasting	N/A	•	•	D						
Lauric acid (C12:0)					•	•	D						
Myristic acid (14:0)					•	•	D						
Pentadecanoic acid (C15:0)					•	•	D						
Palmitic acid (16:0)					•	•	D						
Margaric acid (C17:0)					•	•	D						
Stearic acid (18:0)					•	•	D						
Arachidic acid (20:0)					•	•	D						
Docosanoic acid (22:0)					•	•	D						
Tricosanoic acid (C23:0)					•	•	D						

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Lignoceric acid (24:0)				•	•	D				
Myristoleic acid (14:1n-5)				•	•	D				
Palmitoleic acid (16:1n-7)				•	•	D				
cis-Vaccenic acid (18:1n-7)				•	•	D				
Oleic acid (18:1n-9)				•	•	D				
Eicosenoic acid (20:1n-9)				•	•	D				
Docosenoic acid (22:1n-9)				D						
Nervonic acid (24:1n-9)				•	•	D				
Linoleic acid (18:2n-6)				•	•	D				
alpha-Linolenic acid (18:3n-3)				•	•	D				
gamma-Linolenic acid (18:3n-6)				•	•	D				
Stearidonic acid (C18:4n-3)				•	•	D				
Eicosadienoic acid (20:2n-6)				•	•	D				
homo-gamma-Linolenic acid (20:3n-6)				•	•	D				
Eicosatrienoic acid (C20:3n-9)				•	•	D				
Arachidonic acid (20:4n-6)				•	•	D				
Eicosapentaenoic acid (20:5n-3)				•	•	D				
Docosatetraenoic acid (22:4n-6)				•	•	D				
Docosapentaenoic acid (22:5n-3)				•	•	D				
Docosapentaenoic acid (22:5n-6)				•	•	D				
Docosahexaenoic acid (22:6n-3)				•	•	D				
Fatty acids in RBCs (NBB)										
% alpha-Linolenic acid (C18:3n3)	RBC	6+	5+					•	•	
% Arachidic acid (C20:0)								•	•	
% Arachidonic acid (C20:4n6)								•	•	
% Docosanoic acid (C22:0)								•	•	
% Docosahexaenoic acid (C22:6n3)								•	•	
% Docosapentaenoic acid 3 (C22:5n3)								•	•	
% Docosapentaenoic acid 6 (C22:5n6)								•	•	
% Docosatetraenoic acid (C22:4n6)								•	•	

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26		
% Docosatetraenoic acid (C22:4n6)								•	•			
% 11-Eicosenoic acid (C20:1n9)								•	•			
% Eicosapentaenoic acid (C20:5n3)								•	•			
% gamma-Linolenic acid (C18:3n6)								•	•			
% homo-gamma-Linolenic acid (C20:3n6)								•	•			
% Tetracosanoic acid (C24:0)								•	•			
% Linoleic acid (C18:2n6)								•	•			
% Myristic acid (C14:0)								•	•			
% 15-Tetracosenoic acid (C24:1n9)								•	•			
% Oleic acid (C18:1n9)								•	•			
% Palmitoleic acid (C16:1n7)								•	•			
% Palmitic acid (C16:0)								•	•			
% Stearic acid (C18:0)								•	•			
Fat-Soluble Vitamins and Micronutrients												
Vitamin A	Serum	NH17-18: 6+	5+					•	D	C		
Vitamin E			N/A						•	D		
Retinyl palmitate									•	D		
Retinyl stearate										•	D	
Gamma-Tocopherol										•	D	
delta-Tocopherol												
alpha-carotene										•	D	
Trans-beta-carotene											•	D
Cis-beta-carotene											•	D
alpha-Cryptoxanthin											•	D
beta-Cryptoxanthin											•	D
Lutein/zeaxanthin combined or measured and reported as separate analytes											•	D
trans-Lycopene											•	D
Total lycopene											•	D

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle < 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26		
25-OH Vitamin D (D2 + D3)				5+	•	•	•	•	D	C			
25-OH Vitamin D2					•	•	•	•	D	C			
25-OH Vitamin D3					•	•	•	•	D	C			
epimer-25-OH Vitamin D3					•	•	•	•	D	C			
Iron-Status and Inflammation Indicators													
Ferritin		Serum	NH03-16: 1-5 & ♀ 12-49 NH17-20: 1-5 & 12+	1-5 & 12+	D		Surplus	Surplus	•	C			
Transferrin receptor			NH03-16: 1-5 & ♀ 12-49 NH17-18: 1-5 & 12+ NH19-20: 1-5y & ♀ 12-49	1-5 & ♀ 12-49	D		•	•	•	C			
Alpha-acid-1-glycoprotein			NH15-18: 1-5 & ♀ 12-49					•	•		C		
Iron			1/3	1/2									
TIBC													
Transferrin saturation													
Protoporphyrin													
Phytoestrogens and Metabolites													
Daidzein		Urine	6+	N/A	D								
Enterodiol					D								
Enterolactone					D								
Equol					D								
Genistein					D								
O-Desmethylangolensin					D								
Water-Soluble Vitamins and Related Compounds													
Folate (Serum)		Serum	1+	N/A	D								

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Folate (RBC)	RBC	NH11-16: 1+ NH17-20: ♀ 12-49; 1/2 (♂ 1+, ♀ 1-11 & 50+)	♀ 12-49 ; 1/2 (♂ 1+, ♀ 1-11 & 50+)	•	•	•	•	•	C	
Total folate (calculated)				•	•	•	•	•	C	
5-Methyltetrahydrofolate				•	•	•	•	•	C	
Folic acid				•	•	•	•	•	C	
5-Formyltetrahydrofolate				•	•	•	•	•	C	
Tetrahydrofolate				•	•	•	•	•	C	
5,10-Methenyltetrahydrofolate				•	•	•	•	•	C	
MeFox oxidation product				•	•	•	•	•	C	
Folate forms by LC-MS/MS	Serum	1/3	1/2							
Folate forms by LC-MS/MS (RBC)			1/3							
Total folate (calculated)	RBC	NH19-20: 6+	5+					•	C	
5-Methyltetrahydrofolate								•	C	
Folic acid								•	C	
5-Formyltetrahydrofolate								•	C	
Tetrahydrofolate								•	C	
5,10-Methenyltetrahydrofolate								•	C	
MeFox oxidation product								•	C	
Homocysteine	Plasma	20+	N/A							
Methylmalonic acid	Plasma/ Serum	3+	5+	•	•	D				•
Vitamin B12		20+		•	•	D				•
Vitamin B6 (pyridoxal-5'-phosphate)	Serum	1+		D						
Vitamin B6 (4-pyridoxic acid)		D								•
Vitamin C (ascorbic acid)		NH17-18: 6+					•	D	C	
Vitamin D										
Personal Care and Consumer Product Chemicals and Metabolites										
Benzophenone-3	Urine	1/3	3-4 & 1/2 of 5+	•	•	•	•	•	•	
Bisphenol A				•	•	•	•	•	•	
Bisphenol F					•	•	•	•	•	
Bisphenol S					•	•	•	•	•	

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26		
Triclocarban					•	•	•	•	•			
4-tert-Octyl phenol				D								
Triclosan				•	•	•	•	•	•	•	•	
Butyl paraben				•	•	•	•	•	•	•	•	
Hydroxy Butyl paraben									Surplus	•	•	
Ethyl paraben				•	•	•	•	•	•	•	•	
Methyl paraben				•	•	•	•	•	•	•	•	
n-Propyl paraben				•	•	•	•	•	•	•	•	
Di-hydroxy avobenzone									Surplus	•	•	
2,4-Dichlorophenol				•	•	•	•	•	•	•	•	
2,5-Dichlorophenol				•	•	•	•	•	•	•	•	
Flame-Retardant Metabolites												
Bis(1-chloro-2-propyl) phosphate (BCPP)	Urine	1/3	3-4 & 1/2 of 5+	Surplus	Surplus		Surplus	•	•			
Bis(2-chloroethyl) phosphate (BCEtP)						Surplus	•	•				
Bis(1,3-dichloro-2-propyl) phosphate (BDCPP)						Surplus	•	•				
Dibenzyl phosphate (DBzP)						Surplus	D					
Dibutyl phosphate (DBuP)						Surplus	•	•				
Di-o-cresylphosphate (DoCP)												
Di-p-cresylphosphate (DpCP)												
Di-cresyl phosphate (DCP)				Surplus		Surplus	D	D				
Diphenyl phosphate (DPHP)					Surplus	Surplus	Surplus	•	•			
2,3,4,5-Tetrabromobenzoic acid (TBBA)					Surplus	Surplus	Surplus	•	•			
2-((isopropyl)phenyl) phenyl phosphate (iPPPP)						Surplus	Surplus		•			
4-((tert-butyl)phenyl)phenyl phosphate (tBPPP)						Surplus	Surplus		•			
Bis(2-butoxyethyl) phosphate (BBOEP)										•		
Bis(2-butoxyethyl) 2-hydroxyethyl phosphate (BBOEHEP)										•		
Bis(2-butoxyethyl) [(3-hydroxybutyl)oxy]ethyl phosphate (3HO-TBOEP)										•		
2-ethylhexyl phenyl phosphate (EHPHP)										•		
2-ethyl-5-hydroxyhexyl diphenyl phosphate (5HO-EHDPP)										•		
1-hydroxy-2-propyl bis(1-chloro-2-propyl) phosphate							•					

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
(BCIPHIPP)										
Tris(2-chloroethyl)phosphate (TCETP)										•
Dibutyl 3-Hydroxybutyl Phosphate (3HO-TBuP)										•
Di isobutyl phosphate (DiBuP)										•
4-Hydroxyphenyl diphenyl phosphate (4HO-DPhP)										•
2-(2-Methylphenoxy)-4H-1,3,2-benzodioxaphosphorin 2-oxide (CBDP)										•
Fungicides and Metabolites (OAT)										
ortho-Phenylphenol				D						
Ethylenethio Urea (ETU)		Urine								
Pentachlorophenol										
Propylenethio Urea (PTU)										
Herbicides and Metabolites										
Atrazine		Urine								
Atrazine mercapturate										
Desethyl atrazine										
Desisopropyl atrazine										
Desisopropyl atrazine mercapturate										
Diaminochloroatrazine										
2,4-Dichlorophenoxyacetic acid				•	•	•	•	•	•	
2,4,5-Trichlorophenoxyacetic acid				D						
Desethyl atrazine mercapturate										
N-(phosphonomethyl)glycine (Glyphosate)			1/3							
N-Acetyl-AMPA										•
N-Acetyl-glyphosate										•
Aminomethylphosphonic acid (AMPA)						Surplus	Surplus			D
Dicamba (3,6-dichloro-2-methoxybenzoic acid)										•
3,6 Dichlorosalicylic acid (dicamba metabolite)										•
Glufosinate (Phosphinothricin; (RS)-2-Amino-4-(hydroxy(methyl)phosphonoyl)butanoic acid)										•
N-Acetyl-glufosinate (N-acetylphosphinothricin)										•

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26		
3-(Methylphosphinico)propionic acid (glufosinate metabolite)										•			
Sulfonyl Urea Herbicides (Herbicides: Substituted Ureas)													
Bensulfuron-methyl		Urine	1/3	1/2									
Chlorsulfuron													
Ethametsulfuron-methyl													
Foramsulfuron													
Halosulfuron													
Mesosulfuron-methyl													
Metsulfuron-methyl													
Nicosulfuron													
Oxasulfuron													
Primisulfuron-methyl													
Prosulfuron													
Rimsulfuron													
Sulfometuron-methyl													
Sulfosulfuron													
Thifensulfuron-methyl													
Triasulfuron													
Triflurosulfuron-methyl													
Insect Repellent and Metabolites													
N,N-Diethyl-meta-toluamide (DEET)		Urine	1/3	1/2	•	•	D						
3-(Diethylcarbamoyl) benzoic acid (DEET acid/DCBA)					•	•	•	•	•	•			
3-(Ethylcarbamoyl) benzoic acid (MEA/ECBA)							Surplus	•	•	•			
N,N-Diethyl-3-(hydroxymethyl) benzamide (Desethyl hydroxy DEET/DHMB)					•	•	D						
Neonicotinoid Insecticides													
Acetamiprid (ACET)		Urine	1/3	1/2			Surplus	Surplus	•	D			
Clothianidin (CLOT)										•	•		
N-Desmethylacetamiprid (AND)										•	•		
5-Hydroxyimidacloprid (OHIM)										•	•		

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26		
Imidacloprid (IMID)									●	D			
Thiacloprid (THIA)											●	D	
Clothianidin Desmethyl (CLOD)												●	
Clothianidin Urea (CLOU)												●	
Flupyradifurone (FLUP)												●	
Imidacloprid Guanidine (IMIG)												●	
Nitenpyram Desmethyl (NITD)												●	
Thiamethoxam Desmethyl (TMXD)												●	
Sulfoxaflor 1 (SLF1)												●	
Sulfoxaflor 2 (SLF2)												●	
Carbamate Pesticide Metabolites													
Carbofuranphenol		Urine	1/3	1/2									
2-Isopropoxyphenol													
Organophosphorus Insecticides: Dialkyl Phosphate Metabolites													
Diethylphosphate (DEP)		Urine	1/3	1/2	●	D	●	●	●	●			
Dimethylphosphate (DMP)					●	D	●	●	●	●	●	●	
Diethylthiophosphate (DETP)					●	D	●	●	●	●	●	●	
Dimethylthiophosphate (DMTP)					●	D	●	●	●	●	●	●	
Diethyldithiophosphate (DEDTP)					●	D	●	●	●	●	●	●	
Dimethyldithiophosphate (DMDTP)					●	D	●	●	●	●	●	●	
Organophosphorus Insecticides: Specific Metabolites													
Acephate		Urine		1/2									
Dimethoate													
Methamidaphos													
Omethoate													
Malathion dicarboxylic acid					●	●	●	●	●	●	●	D	
2-Isopropyl-4-methyl-6-hydroxypyrimidine (IMPY)					●	●	●	●	●	●	●	●	
para-Nitrophenol					●	●	●	●	●	●	●	●	
3,5,6-Trichloro-2-pyridinol (TCPy)					●	●	●	●	●	●	●	●	
2-diethylamino-6-methyl pyrimidin-4-ol							1/3						

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle < 21-23	Sample Cycle > 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26		
Pyrethroid Metabolites												
trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (trans-DCCA)	Urine	44929	44928	●	●	●	●	●	●			
cis-3-(2,2-Dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid (cis-DBCA)				●	●	●	●	●	D			
4-Fluoro-3-phenoxybenzoic acid (4F3PBA)				●	●	●	●	●	D			
3-Phenoxybenzoic acid (3PBA)				●	●	●	●	●	●			
cis-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (cis-DCCA)												
Organochlorine Pesticides and Metabolites												
Aldrin	Serum	1/3	1/2									
Dieldrin												
Endrin												
Heptachlor Epoxide												
Oxychlorane							P	P	P	●	●	●
trans-Nonachlor							P	P	P	●	●	●
p,p'-DDT							P	P	P	●	●	●
p,p'-DDE							P	P	P	●	●	●
o,p'-DDT												
Hexachlorobenzene							P	P	P	●	●	●
beta-Hexachlorocyclohexane	Urine	1/3	1/2	P	P	P	●	●	●			
gamma-Hexachlorocyclohexane				P	D							
Mirex				P	P	P	●	●	●			
2,4,5-Trichlorophenol				D								
2,4,6-Trichlorophenol				D								
Polybrominated Diphenyl Ethers and Brominated Biphenyl 153												
2,2',4'-Tribromodiphenyl ether (BDE 17)	Serum	1/3	1/2	P	P	P	●	●	●			
2,4,4'-Tribromodiphenyl ether (BDE 28)				P	P	P	●	●	●			
2,2',4,4'-Tetrabromodiphenyl ether (BDE 47)				P	P	P	●	●	●			
2,3',4,4'-Tetrabromodiphenyl ether (BDE 66)				P	P	P						
2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85)				P	P	P	●	●	●			

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
2,2',4,4',5-Pentabromodiphenyl ether (BDE 99)				P	P	P	●	●	●	
2,2',4,4',6-Pentabromodiphenyl ether (BDE 100)				P	P	P	●	●	●	
2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153)				P	P	P	●	●	●	
2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154)				P	P	P	●	●	●	
2,2',3,4,4',5',6-Heptabromodiphenyl ether (BDE 183)				P	P	P	●	●	●	
2,2',3,3',4,4',5,5',6,6'-Decabromodiphenyl ether (BDE 209)				P	P	P	●	●	●	
2,2',4,4',5,5'-Hexabromobiphenyl (PBB 153)				P	P	P	●	●	●	
Polychlorinated Dibenzo-p-dioxins										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	Serum	1/3	1/2	P	P	P	●	●	●	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)				P	P	P	●	●	●	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)				P	P	P	●	●	●	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)				P	P	P	●	●	●	
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)				P	P	P	●	●	●	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)				P	P	P	●	●	●	
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)				P	P	P	●	●	●	
Polychlorinated Dibenzofurans										
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	Serum	1/3	1/2	P	P	P	●	●	●	
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)				P	P	P	●	●	●	
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)				P	P	P	●	●	●	
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)				P	P	P	●	●	●	
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)				P	P	P	●	●	●	
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)				P	P	P	●	●	●	
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)				P	P	P	●	●	●	
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)				P	P	P	●	●	●	
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)				P	P	P	●	●	●	
2,3,7,8-Tetrachlorodibenzofuran (TCDF)				P	P	P	●	●	●	
Dioxin-like Polychlorinated Biphenyls: Coplanar PCBs										
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	Serum	1/3	1/2	P	P	P	●	●	●	
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)				P	P	P	●	●	●	

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)				P	P	P	●	●	●		
Dioxin-like Polychlorinated Biphenyls: Mono-ortho-Substituted PCBs											
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	Serum	1/3	1/2	P	P	P	●	●	●		
2,3,3',4,4'-Pentachlorobiphenyl (PCB 114)				P	P	P	●	●	●		
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)				P	P	P	●	●	●		
2',3,4,4',5-Pentachlorobiphenyl (PCB 123)											
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)				P	P	P	●	●	●		
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)				P	P	P	●	●	●		
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)				P	P	P	●	●	●		
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)				P	P	P	●	●	●		
Polychlorinated Biphenyls: Non-Dioxin-Like											
2,4,4'-Trichlorobiphenyl (PCB 28)	Serum	1/3	1/2	P	P	P	●	●	●		
2,2'3,5'-Tetrachloro biphenyl (PCB 44)											
2,2',4,5'-Tetrachloro biphenyl (PCB 49)											
2,2',5,5'-Tetrachlorobiphenyl (PCB 52)											
2,3',4,4'-Tetrachlorobiphenyl (PCB 66)				P	P	P	●	●	●		
2,4,4',5-Tetrachlorobiphenyl (PCB 74)				P	P	P	●	●	●		
2,2',3,4,5'-Pentachlorobiphenyl (PCB 87)											
2,2',4,4',5-Pentachlorobiphenyl (PCB 99)				P	P	P	●	●	●		
2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)											
2,3,3',4',6-Pentachlorobiphenyl (PCB 110)											
2,2',3,3',4,4'-Hexachlorobiphenyl (PCB 128)											
2,2',3,4,4',5' and 2,3,3',4,4',6-Hexachlorobiphenyl (PCB 138 & 158)				P	P	P	●	●	●		
2,2',3,4',5,5'-Hexachlorobiphenyl (PCB 146)				P	P	P	●	●	●		
2,2',3,4',5,6-Hexachlorobiphenyl (PCB 149)											
2,2',3,5,5',6-Hexachlorobiphenyl (PCB 151)											
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)				P	P	P	●	●	●		
2,2',3,3',4,4',5-Heptachlorobiphenyl (PCB 170)				P	P	P	●	●	●		
2,2',3,3',4,5,5'-Heptachlorobiphenyl (PCB 172)											

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
2,2',3,3',4,5',6'-Heptachlorobiphenyl (PCB 177)										
2,2',3,3',5,5',6-Heptachlorobiphenyl (PCB 178)				P	P	P	•	•	•	
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)				P	P	P	•	•	•	
2,2',3,4,4',5',6-Heptachlorobiphenyl (PCB 183)				P	P	P	•	•	•	
2,2',3,4',5,5',6-Heptachlorobiphenyl (PCB 187)				P	P	P	•	•	•	
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (PCB 194)				P	P	P	•	•	•	
2,2',3,3',4,4',5,6-Octachlorobiphenyl (PCB 195)									•	
2,2',3,3',4,4',5,6' and 2,2',3,4,4',5,5',6-Octachlorobiphenyl (PCB 196 & 203)				P	P	P	•	•	•	
2,2',3,3',4,5,5',6-Octachlorobiphenyl (PCB 199)				P	P	P	•	•	•	
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB 206)				P	P	P	•	•	•	
2,2',3,3',4,4',5,5',6,6'-Decachloro biphenyl (PCB 209)				P	P	P	•	•	•	
Perfluoroalkyl and Polyfluoroalkyl Substances: Surfactants										
Perfluorobutane sulfonic acid (PFBS)	Serum			•	& Surplus	D				
Perfluorodecanoic acid (PFDA)				•	& Surplus	•	•	•	•	
Perfluorododecanoic acid (PFDoA)				•	& Surplus	•	D			
Perfluoroheptanoic acid (PFHpA)				•	& Surplus	D				
Perfluorohexane sulfonic acid (PFHxS)				•	& Surplus	•	•	•	•	
Perfluorononanoic acid (PFNA)		1/3	1/2	•	& Surplus	•	•	•	•	
Perfluorooctanoic acid (PFOA)				•	& Surplus					
n-Perfluorooctanoic acid (n-PFOA)					& Surplus	•	•	•	•	
Branched Perfluorooctanoic acid isomers (Sb-PFOA)*					Surplus	•	•	•	•	
Perfluorooctane sulfonic acid (PFOS)				•	•					
n-Perfluorooctane sulfonic (n-PFOS)					• Surplus	•	•	•	•	
Perfluoromethylheptane sulfonic acid isomers (Sm-PFOS)*						•	•	•	•	
Perfluorooctane sulfonamide (PFOSA or FOSA)				•						

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Perfluoroheptanesulfoic acid (PFHpS)							& Surplus	D		
Perfluorohexanoic acid (PFHxA)							Surplus	D		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)								D		
Adona (4,8-dioxa-3H-perfluorononanoic acid) (ADONA)								D		
GenX (2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (HFPO-DA))								D		
2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid (EtFOSAA)				•	Surplus					
2-(N-Methyl-perfluorooctane sulfonamido) acetic acid (MeFOSAA)				•		•	•	•	•	
Perfluoroundecanoic acid (PFUA or PFUnDA)				•		•	•	•	•	
Perfluoroalkyl and Polyfluoroalkyl Substances: Urine										
Perfluorobutanoic acid (PFBA)		1/3	1/2		& Surplus		Surplus	D		
PFBS										
PFDA										
Perfluoroheptane sulfonic acid (PFHpS)		1/3	1/2				Surplus	D	•	
PFHpA										
PFHxS										
Perfluorohexanoic acid (PFHxA)		1/3	1/2				Surplus	D	•	
PFNA										
n-PFOA										
Sb-PFOA										
n-PFOS										
Sm-PFOS										
Perfluoropentanoic acid (PFPeA)		1/3	1/2				Surplus	D		
PFUnDA										
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)		1/3	1/2				Surplus	D		
Adona (4,8-dioxa-3H-perfluorononanoic acid) (ADONA)							Surplus	D		
GenX (2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (HFPO-DA))							Surplus	D		
Phthalate and Phthalate Alternative Metabolites										

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26		
Mono-benzyl phthalate (MBzP)	Urine	1/3	1/2	•	•	•	•	•	•			
Mono-2-hydroxybutyl phthalate (MHBP)					Surplus	•	•	•	•			
Mono-n-butyl phthalate (MnBP)				•	•	•	•	•	•	•		
Mono-iso-butyl phthalate (MiBP)				•	•	•	•	•	•	•		
Mono-2-hydroxyisobutyl phthalate (MHiBP)								& Surplus	& Surplus	& Surplus	•	•
Mono-cyclohexyl phthalate (MCHP)				D								
Mono-ethyl phthalate (MEP)				•	•	•	•	•	•	•	•	
Mono-2-ethylhexyl phthalate (MEHP)				•	•	•	•	•	•	•	•	
Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)				•	•	•	•	•	•	•	•	
Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)				•	•	•	•	•	•	•	•	
Mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP)				•	•	•	•	•	•	•	•	•
Mono-carboxyisononyl phthalate (MCNP)				•	•	•	•	•	•	•	•	•
Mono-oxoisodecyl phthalate (MODP)									WD	WD	D	
Mono-isononyl phthalate (MiNP)				•	•	•	•	•	•	•	D	
Mono-oxoisononyl phthalate (MONP)	Urine	1/3	1/2			& Surplus	& Surplus	•	•			
Mono-carboxyisooctyl phthalate (MCOP)				•	•	•	•	•	•	•		
Mono-methyl phthalate (MMP)				•	D							
Mono-(3-carboxypropyl) phthalate (MCP)				•	•	•	•	•	•	•	•	
Mono-n-octyl phthalate (MOP)				D								
Cyclohexane 1,2-dicarboxylic acid mono hydroxy isononyl ester (MHNCH®)				•	•	•	•	•	•	•	•	
Cyclohexane-1,2-dicarboxylic acid-mono(carboxyoctyl) ester (MCOCH)								WD	•	•	•	•
Mono (2-ethyl-5-carboxypentyl) terephthalate (MECPTP)									& Surplus	& Surplus	•	•
Mono (2-ethyl-5-hydroxyhexyl) terephthalate (MEHHTP)									& Surplus	& Surplus	•	•
Polycyclic Aromatic Hydrocarbon Metabolites												
2-Hydroxyfluorene	Urine	1/3	1/2	•	•	•	•	•	•			
3-Hydroxyfluorene				•	•	•	•	•	•	•		
9-Hydroxyfluorene				•	D							

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
1-Hydroxyphenanthrene				●	●	●	●	●	●	
2-Hydroxyphenanthrene				●	D					
3-Hydroxyphenanthrene				●	D					
2- & 3-Hydroxyphenanthrene					●	●	●	●	●	
4-Hydroxyphenanthrene				●	D					
1-Hydroxypyrene				●	●	●	●	●	●	
1-Hydroxynaphthalene (1-Naphthol)				●	●	●	●	●	●	
2-Hydroxynaphthalene (2-Naphthol)				●	●	●	●	●	●	
Phenylpyrazole insecticides (fipronil)										
Fipronil ((RS)-5-Amino-1-[2,6-dichloro-4-(trifluoromethyl)phenyl]-4-(trifluoromethylsulfinyl)pyrazole-3-carbonitrile)				-	-	Surplus	Surplus	-	●	-
Fipronil-desulfinyl	Urine	1/3	1/2	-	-	Surplus	Surplus	-	●	-
Fipronil Sulfone				-	-	Surplus	Surplus	-	●	-
Fipronil Carboxamide				-	-	Surplus	Surplus	-	●	-
Fipronil Sulfide				-	-	Surplus	Surplus	-	●	-
Hydroxy-Fipronil	-			-	-	Surplus	Surplus	-	●	-
Tobacco Alkaloids and Metabolites (Cotinine and Nicotine Analogs)										
Anabasine, Total	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 of 5+		●	●	●	●	●	
Anatabine, Total					●	●	●	●	●	
Cotinine	Serum	3+	2+	●	●	●	●	●	●	
Cotinine, Total	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 of 5+		●	●	●	●	●	
Cotinine N-Oxide, Total					●	●	●	●	●	
trans-3'-Hydroxycotinine, Total	Serum	3+	2+		●	●	●	●	●	
trans-3'-Hydroxycotinine, Total	Urine				●	●	●	●	●	
Norcotinine	-			-	●	●	WD	WD	D	-
1-(3-Pyridyl)-1-butanol-4-carboxylic acid		3-5 & 1/3 of 6+	3-4 & 1/2 of 5+		WD	●	●	●	●	
Nicotine					●	●	●	●	●	
Nicotine 1'-Oxide, Total					●	●	●	●	●	
Nornicotine					●	●	●	●	●	

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle < 21-23	Sample Cycle > 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Tobacco Biomarkers: Tobacco-specific Nitrosamines (TSNAs)										
N'-Nitrosoanabasine (NAB)	Urine	3-5 & 1/3 of 6+	3-4 & 1/2 of 5+		●	WD	WD	WD	WD	
N'-Nitrosoanatabine (NAT)				●	WD	WD	WD	WD		
N'-Nitrososornicotine (NNN)				●	WD	WD	WD	WD		
4-(Methylnitrosamino)-1-(3-pyridyl)-1-Butanol (NNAL)				●	●	●	●	●	●	
4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK)					WD	WD	WD	WD	WD	
Tobacco Biomarkers: Volatile N-Nitrosamines										
N-Nitrosodiethylamine (NDEA)	Urine	1/3	1/2		●	WD	D	D	D	
N-nitrosodimethylamine (NDMA)				WD	WD	D	D	D		
N-Nitrosoethylmethylamine (NMEA)				●	WD	D	D	D		
N-nitrosomorpholine (NMOR)				●	WD	D	D	D		
N-Nitrosopiperidine (NPIP)				●	WD	D	D	D		
N-Nitrosopyrrolidine (NPYR)				●	WD	D	D	D		
Disinfection Byproducts - Volatile Organic Compounds (VOCs) - Trihalomethanes & MTBE (IN WATER)										
Bromodichloromethane	Water	1/3	1/2	D						
Dibromochloromethane (Chlorodibromomethane)				D						
Tribromomethane (Bromoform)				D						
Trichloromethane (Chloroform)				D						
Methyl tert-butyl ether (MTBE)				D						
Disinfection Byproducts - Volatile Organic Compounds (VOCs) - Trihalomethanes & MTBE										
Bromodichloromethane	Whole Blood	1/2 of 12+	1/2 of 12+	●	●	●	●	●	●	
Dibromochloromethane (Chlorodibromomethane)				●	●	●	●	●	●	
Tribromomethane (Bromoform)				●	●	●	●	●	●	
Trichloromethane (Chloroform)				●	●	●	●	●	●	
Perchlorate and Other Anions										
Nitrate	Urine	1/3	1/2	●	●	●	●	●	●	
Perchlorate				●	●	●	●	●	●	
Thiocyanate				●	●	●	●	●	●	

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Perchlorate-	-	Water	1/3	1/2	-	-	-	-	-	-	-
Nitrate	-		-	-	-	-	-	-	-	-	-
Fluoride	-	Urine	-	-	-	-	WD	WD	D	-	-
Iodide	-	Water	-	-	-	-	-	-	-	-	-
Tobacco Biomarkers: Heterocyclic Amines											
3-Amino-1,4-dimethyl-5H-pyrido[4,3-b]indole (Trp-P-1)		Urine	1/3	1/2		●	D	WD	WD	D	
2-Amino-3-methyl-9H-pyrido[2,3-b]indole (MeA-α-C)						●	D	WD	WD	D	
2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine (PhIP)						●	D	WD	WD	D	
2-Amino-9H-pyrido[2,3-b]indole (A-α-C)						●	D	WD	WD	D	
2-Amino-3-methyl-3H-imidazo[4,5-f]quinolone (IQ)						●	D	WD	WD	D	
2-Amino-6-methyldipyrido[1,2-a:3',2'-d]imidazole (Glu-P1)						●	D	WD	WD	D	
2-Aminodipyrido[1,2-a:3',2'-d]imidazole (Glu-P2)						●	D	WD	WD	D	
1-Methyl-9H-pyrido[3,4-b]indole (Harman)						●	D	WD	WD	D	
1-Methyl-3-amino-5H-pyrido[4,3-b]indole (Trp-P-2)						●	D	WD	WD	D	
9H-Pyrido[3,4-b]indole (Norharman)						●	D	WD	WD	D	
Volatile Organic Compounds (VOCs)											
1,1,1-Trichloroethane (Methyl chloroform)		Whole Blood	1/2 of 12+	1/2 of 12+	●	●	●	●	●	●	●
1,1,1,2-Tetrachloroethane					●	●	●	●	●	D	
1,1,2,2-Tetrachloroethane					●	D					
1,1,2-Trichloroethane					●	D					
1,2,3-Trichloropropane					●	●	●	●	●	●	●
1,1-Dichloroethane					●	D					
1,1-Dichloroethene (Vinylidene chloride)					●	D					
1,2-Dibromo-3-chloropropane (DBCP)					D						
1,2-Dibromoethane					●	●	●	●	●	●	D
1,2-Dichlorobenzene					●	●	●	●	●	●	●
1,2-Dichloroethane (Ethylene dichloride)					●	●	●	●	●	●	●

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
cis-1,2-Dichloroethene	Whole Blood			•	D						
trans--1,2-Dichloroethylene				•	D						
1,2-Dichloropropane				•	D						
1,3-Dichlorobenzene				•	•	•	•	•	•	•	•
1,4-Dichlorobenzene (p-Dichlorobenzene)				•	•	•	•	•	•	•	•
1,4-Dioxane				•	•	•	WD	D			
1-Bromopropane/Propyl bromide					WD	D					
2,5-Dimethylfuran				•	•	•	•	•	•	•	•
2-Hexanone								WD	•	•	
Benzene				•	•	•	•	•	•	•	•
Benzonitrile					WD	•	•	•	•	•	•
Chlorobenzene (Monochlorobenzene)				•	•	•	•	•	•	•	•
Chloroethane					•	•	•	•	•	•	•
Cyclohexane					•	•	•	•	•	•	•
Dibromomethane				•	D						
Dichloromethane (Methylene chloride)				•	•	•	•	•	•	•	•
Diethyl ether					•	•	•	•	•	•	•
Ethyl acetate					•	•	•	•	•	•	•
Ethylbenzene				•	•	•	•	•	•	•	•
Furan				•	•	•	•	•	•	•	•
n-Heptane					•	•	•	•	•	•	•
Hexachloroethane				•	D						
n-Hexane				•	•	•	•	•	•	•	•
Isobutyronitrile					WD	•	•	•	•	•	•
Isopropylbenzene (Cumene)				•	•	•	•	•	•	•	•
Methyl tert-butyl ether (MTBE)				•	•	•	•	•	•	•	•
Methylcyclopentane					•	•	•	•	•	•	•
Methyl isobutyl ketone					WD	WD	•	•	•	•	•
Nitrobenzene				•	•	•	•	•	•	D	
Nitromethane				•	D						

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26		
n-Octane	Whole Blood				•	•	•	•	•	•		
Styrene				X1	X1	X1	X1	X1	•	•		
Tetrachloroethene (Perchloroethylene)				•	•	•	•	•	•	•		
Tetrachloromethane (Carbon tetrachloride)				•	•	•	•	•	•	•		
Tetrahydrofuran					•	•	•	•	•	•		
Toluene				X1	•	•	X1	X1	•	•		
Trichloroethene (Trichloroethylene)				•	•	•	•	•	•	•		
α,α,α-Trifluorotoluene					•	•	•	•	D			
Vinyl bromide					•	•	•	•	D			
m-/p-Xylene				•	•	•	•	•	•	•		
o-Xylene				•	•	•	•	•	•	•		
α-Pinene										•	•	•
Volatile Organic Compound Metabolites (VOC metabolites)												
N-Acetyl-S- (2-carboxyethyl)-L-cysteine (CEMA)	Urine	1/3	3-4 & 1/2 of 5+	•	•	•	•	•	•	•		
N-Acetyl-S- (3-hydroxypropyl)-L-cysteine (HPMA)				•	•	•	•	•	•	•		
N-Acetyl-S-(2-carbamoyl-ethyl)-L-cysteine (AAMA)				•	•	•	•	•	•	•		
N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine (GAMA)				•	•	•	•	•	•	•		
N-Acetyl-S-(1-cyano-2-hydroxyethyl)-L-cysteine						•	•	•	•	•		
N-Acetyl-S-(2-cyanoethyl)-L-cysteine (CYMA)				•	•	•	•	•	•	•		
N-Acetyl-S- (2-hydroxyethyl)-L-cysteine (HEMA)				•	•	•	•	•	•	•		
N-Acetyl-S-(phenyl)-L-cysteine (PMA)				•	•	•	D					
N-Acetyl-S-(n-propyl)-L-cysteine (BPMA)				•	•	•	•	•	•	•		
N-Acetyl-S- (3,4-dihydroxybutyl)-L-cysteine (DHBM)				•	•	•	•	•	•	•		
N-Acetyl-S- (1-hydroxymethyl-2-propenyl)-L-cysteine (MHB1)				•	•	•	D					
N-Acetyl-S- (2-hydroxy-3-butenyl)-L-cysteine (MHB2)				•	•	•	D					
N-Acetyl-S-(2-hydroxy-3-methyl-3-buten-1-yl)-L-cysteine + N-Acetyl-S-[1-(hydroxymethyl)-2-methyl-2-propen-1-yl]-L-cysteine						WD	•	D				

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26			
N-Acetyl-S- (4-hydroxy-2-butenyl)-L-cysteine (MHB3)	Urine			●	●	●	●	●	●	●			
N-Acetyl-S-(4-hydroxy-2-methyl-2 buten-1-yl)-L-cysteine						●	●	●	●	●	●	●	
2-Thioxothiazolidine-4-carboxylic acid (TTCA)						●	●	WD	●	●	●	●	●
N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine (HPMM)						●	●	●	●	●	●	●	●
2-Aminothiazoline-4-carboxylic acid (ATCA)						●	●	●	●	●	●	●	●
N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine (AMCA)						●	●	●	●	●	●	●	●
Phenylglyoxylic acid (PHGA)						●	●	●	●	●	●	●	●
N-Acetyl-S- (2-hydroxypropyl)-L-cysteine (HPM2)						●	●	●	●	●	●	●	●
N-Acetyl-S-(1-phenyl-2-hydroxyethyl)-L-cysteine + N-Acetyl-S-(2-phenyl-2-hydroxyethyl)-L-cysteine (PHEM)						●	●	●	●	●	●	●	●
Mandelic acid (MADA)						●	●	●	●	●	●	●	●
N-Acetyl-S-(trichlorovinyl)-L-cysteine (TCVM)						●	●	●	D				
N-Acetyl-S-(benzyl)-L-cysteine (BMA)						●	●	●	●	●	●	●	●
N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine (1DCV)						●	●	●	D				
N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine (2DCV)						●	●	●	D				
N-Acetyl-S-(dimethylphenyl)-L-cysteine (DPMA)						●	●	●	D				
2-Methylhippuric acid (2MHA)						●	●	●	●	●	●	●	●
3- & 4-Methylhippuric acid (34MH)						●	●	●	●	●	●	●	●
MMA N-Acetyl-S-methyl-L-cysteine			3-4, 1/2 of 5+								●		
PPMA N-Acetyl-S-(6-hydroxy-2,4-cyclohexadiene-1-yl)-L-cysteine)											●		
†,† Muconic acid (MUCA)					WD	WD	WD	D					
N-Acetyl-S(((4-[Methylsulfinyl]butyl) amino)thioxomethyl)-L-cysteine (SUMA)		1/3	1/2										
Aldehydes													
Acetaldehyde	Serum	1/3 of smokers	1/2 of smokers			D							
Acrolein						D							
Benzaldehyde					●	D							
Butyraldehyde					●	D							

Analyte/Chemical/Metabolite		Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26
Crotonaldehyde						●	D				
Decanaldehyde						●	D				
Furaldehyde							D				
Heptanaldehyde						●	D				
Hexanaldehyde						●	D				
Isobutyraldehyde							D				
Isopentanaldehyde						●	D				
Nonanaldehyde						●	D				
Octanaldehyde						●	D				
Pentanaldehyde						●	D				
Propanaldehyde						●	D				
o-Tolualdehyde						●	D				
trans-Hexanal							D				
trans-Octenal							D				
trans-Nonenal							D				
Tobacco Biomarkers: Aromatic Amines (TVB)											
						●	WD	WD	WD	D	
1-Aminonaphthalene							WD	WD	WD	D	
2-Aminonaphthalene						●	WD	WD	WD	D	
o-Anisidine						●	WD	WD	WD	D	
2,6-Dimethylaniline						●	WD	WD	WD	D	
o-Toluidine						●	WD	WD	WD	D	
Quinoline	Urine		1/3	1/2	-	WD	WD	WD	WD	Ø	
Urinary Aromatic Diamines (formerly Diisocyanate metabolites and urinary amines)											
4,4'-Diaminodiphenylmethane (4MDA)					Surplus		●	D			
1,5-Diaminonaphthalene (5NDA)							●	D			
2,4-Diaminotoluene (4TDA)							●	D			
2,6-Diaminotoluene (6TDA)							●	D			
p-Phenylenediamine (PPDA)							●	D			
o-Phenylenediamine (OPDA)					Surplus		WD	D			

Analyte/Chemical/Metabolite	Measured Matrix	Sample Cycle ≤ 21-23	Sample Cycle ≥ 25-26	11-12	13-14	15-16	17-18	19-20	21-23	25-26	
5-Amino-1,3,3-trimethylcyclohexanemethylamine (IPDA)						WD	●	●			
Hexamethylenediamine (HAD)						WD	●	●			
β-N-Methylamino-L-alanine (BMAA)						WD	●	●			
Trimethylamine N-oxide (TMAO)						WD	●	●			
Benzene Metabolites (VOC metabolites II)											
N-2-Furoylglycine (N2FG)	Urine	1/3	1/2				Surplus		●		
5-Hydroxymethyl-2-furancarboxylic acid (HMFA)							Surplus		●		
2,5-Furandicarboxylic acid (FDCA)							Surplus				
5-Hydroxymethyl-2-furoylglycine (HMFG)							Surplus		●		
N-Acetyl-S-(phenyl)-L-cysteine (PMA/PHMA)				3-4 & 1/2 of 5+				Surplus	●	●	●
t,t-Muconic acid (MUCA)/Muconic acid (MUCA)								Surplus	●	●	●
5-Hydroxy-N-methyl-2-pyrrolidone (5HMP)								WD			
Terpenes in Serum (Terpenes)											
α-Pinene (SAPN)	Serum	1/2 of 5+	1/2 of 5+		Surplus				●	●	
β-Pinene (SBPN)									●	●	
β-Myrcene (SBMY)							Surplus			●	
Δ-3-Carene (SD3C)										●	
d-Limonene (SLIM)							Surplus			●	●
β-Caryophyllene (SBCP)							Surplus			●	
α-Humulene (SAHU)							WD			●	