

VAUDE WASTEWATER GUIDELINE

Version 2.0 / August 2022



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1. VAUDE Wastewater Guideline Version 2.0

VAUDE Wastewater Guidelines align with ZDHC Wastewater Guidelines Version 2.0.

For more information please see:

<https://www.roadmaptozero.com>

VAUDE recognises the importance of addressing hazardous substances that may be discharged into the environment during the manufacturing processes of textile, apparel and footwear products. That is, hazardous substances that could be used deep within the value chain and not just substances that could be present in finished products.

The discharge of wastewater containing hazardous chemicals could have a significant impact on the environment and human health. Therefore, besides addressing conventional wastewater discharge parameters such as

total suspended solids (TSS), biological oxygen demand (BOD), and chemical oxygen demand (COD), these Guidelines also address the priority hazardous chemical substances identified in the VAUDE Manufacturing Restricted Substances

List. The VAUDE MRSL is a list of chemical substances banned from intentional use in the textile, apparel and footwear industries.

These Guidelines specify a unified set of testing parameters, limit values and recommended analytical test methods.

More information about sampling and analysis procedures and Sludge Sampling and Analysis Plan please refer to ZDHC wastewater Guidelines.

VAUDE, ZDHC Brands and the suppliers they work with are encouraged to share their testing results in a systematic, efficient manner via an online platform called the ZDHC Gateway – Wastewater Module.

2. Expectations for suppliers with non-Conformance(s)

If a test report indicates non-conformances towards VAUDE limits, the supplier is expected to:

- Notify the applicable authorities about any legal permit violation, as well as VAUDE and/or other clients.
- Develop a root cause analysis and corrective action plan with defined completion date. An input stream management review could be part of the initial root cause analysis, with action such as checking if chemical formulations used in production processes are conform to MRSL, sending out specifications to raw material suppliers, or checking chemicals used in non-production related areas, e.g. APEOs used in cleaning products.
- Submit the root cause analysis and corrective action plan with defined completion date on the ZDHC gateway Wastewater Module. Submission is expected to happen within 30 days.
- Suppliers are encouraged to use ZDHC Root Cause Analysis and Corrective Action templates available in the ZDHC Gateway or via VAUDE
- Suppliers may resolve non-compliance or non-conformances in a way they deem best. For instance, they could contact external experts or brands to see if they can offer advice. Or reach out to technical experts to help determine the root cause and identify suitable solutions.

3. ZDHC MRSL Wastewater Parameters and Reporting Limits, Table 1A-1T

Table 1A: Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs): including all isomers

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Nonylphenol ethoxylates (NPEO)	9016-45-9 26027-38-3 37205-87-1 68412-54-4 127087-87-0		NP/OP: ISO 18857-2 (modified dichloromethane extraction) or ASTM D7065 (GC-MS or LC-MS(-MS)) OPEO/NPEO (n>2): ASTM D7742 ISO 18857-2
Nonylphenol (NP), mixed isomers	104-40-5 11066-49-2 25154-52-3 84852-15-3	Textile and Leather: 5	NP/OP: ISO 18857-2 (modified dichloromethane extraction) or ASTM D7065 (GC-MS or LC-MS(-MS)) OPEO/NPEO (n>2): ASTM D7742 ISO 18857-2
Octylphenol ethoxylates (OPEO)	9002-93-1 9036-19-5 68987-90-6		NP/OP: ISO 18857-2 (modified dichloromethane extraction) or ASTM D7065 (GC-MS or LC-MS(-MS)) OPEO/NPEO (n>2): ASTM D7742 ISO 18857-2

Table 1A: Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs): including all isomers (continued)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Octylphenol (OP), mixed isomers	140-66-9 1806-26-4 27193-28-8	Textile and Leather: 5	NP/OP: ISO 18857-2 (modified dichloromethane extraction) or ASTM D7065 (GC-MS or LC-MS(-MS)) OPEO/NPEO (n>2): ASTM D7742 ISO 18857-2

Table 1B: Anti- Microbials & Biocides

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
o-Phenylphenol (+salts)	90-43-7	Textile only: 100	USEPA 8270E Solvent extraction, derivatisation with KOH, acetic anhydride followed by GC-MS BS EN 12673-1999 an alternative method of solvent extraction and derivatization are included
Triclosan	3380-34-5	Textile and Leather: 100	
Permethrin	Multiple	Textile and Leather: 500	USEPA 8270E Solvent extraction, followed by GC-MS ISO 14154:2005 An alternate method, without derivatization and determination by LCMS/LCMSMS is also possible

Table 1C: Chlorinated Paraffins

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Medium-chain Chlorinated paraffins (MCCPs) (C14-C17)	85535-85-9	Textile and Leather: 500	Preparation: EPA 3510 Analysis: ISO18219-2:2021 Method for MCCP with GC-MS(NCI) or LC-MS/MS
Short-chain Chlorinated paraffin (C10 – C13)	85535-84-8	Textile and Leather: 100	Preparation EPA 3510 Analysis: ISO18219-1:2021, ISO 12010:2019 Methods for SCCP with GC-MS(NCI) or LC-MS/MS

Table 1D: Chlorobenzenes and Chlorotoluenes

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
1,2-dichlorobenzene	95-50-1	Textile and Leather: 0.2	USEPA 8260D, 8270E, Purge and Trap, Head Space Dichloromethane extraction followed by GC-MS
Other isomers of mono-, di-, tri-, tetra-, penta- and hexa- Chlorobenzene and mono-, di-, tri-, tetra- and penta- chlorotoluene	Multiple		

Table 1E: Chlorophenols

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
2-chlorophenol	95-57-8	Textile and Leather: 0.5	USEPA 8270E Solvent extraction, derivatisation with KOH, acetic anhydride followed by GC-MS BS EN 12673-1999 the procedure of solvent extraction and derivatization are included
3-chlorophenol	108-43-0		
4-chlorophenol	106-48-9		
2,3-dichlorophenol	576-24-9		
2,4-dichlorophenol	120-83-2		
2,5-dichlorophenol	583-78-8		
2,6-dichlorophenol	87-65-0		
3,4-dichlorophenol	95-77-2		
3,5-dichlorophenol	591-35-5		
2,3,4-trichlorophenol	15950-66-0		
2,3,5-trichlorophenol	933-78-8		
2,3,6-trichlorophenol	933-75-5		
2,4,5-trichlorophenol	95-95-4		
2,4,6-trichlorophenol	88-06-2		
3,4,5-trichlorophenol	609-19-8		
2,3,5,6-tetrachlorophenol	935-95-5		
2,3,4,6-tetrachlorophenol	58-90-2		
2,3,4,5-tetrachlorophenol	4901-51-3		
Pentachlorophenol (PCP)	87-86-5		

Table 1F: Dimethyl Formamide (DMFa)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Dimethyl formamide; N,N-dimethylformamide (DMFa) ^a	68-12-2	Textile only: 1000	EPA 8015, EPA 8270E

Table 1G: Dyes – Carcinogenic or Equivalent Concern

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Basic violet 3 with >0.1% of Michler’s Ketone ^b	548-62-9	Textile and Leather: 500	Liquid extraction, LC-MS
C.I. Acid Red 26	3761-53-3		
C.I. Acid Violet 49	1694-09-3		
C.I. Basic Blue 26 (with Michler’s Ketone > 0.1%)	2580-56-5		
C.I. Basic Green 4 (Malachite Green Chloride)	569-64-2		
C.I. Basic Green 4 (Malachite Green Oxalate)	2437-29-8		
C.I. Basic Green 4 (Malachite Green)	10309-95-2		
C.I. Basic Red 9	569-61-9		
C.I. Basic Violet 14	632-99-5		
C.I. Direct Black 38	1937-37-7		
C.I. Direct Blue 6	2602-46-2		
C.I. Direct Red 28	573-58-0		

^a Sample and Report only for mock leather.

^b Reported concentration refers to the dye part only.

Table 1G: Dyes – Carcinogenic or Equivalent Concern (continued)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
C.I. Disperse Blue 1	2475-45-8	Textile only: 500	Liquid extraction, LC-MS
C.I. Disperse Blue 3	2475-46-9		
Disperse Orange 11	82-28-0		

Table 1H: Dyes – Disperse (Allergenic)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Disperse Blue 102	12222-97-8	Textile only: 50	Liquid extraction, LC-MS
Disperse Blue 106	12223-01-7		
Disperse Blue 124	61951-51-7		
Disperse Blue 26	3860-63-7		
Disperse Blue 35	12222-75-2		
Disperse Blue 35	56524-77-7		
Disperse Blue 7	3179-90-6		
Disperse Brown 1	23355-64-8		
Disperse Orange 1	2581-69-3		
Disperse Orange 3	730-40-5		
Disperse Orange 37/59/76	13301-61-6		
Disperse Red 1	2872-52-8		
Disperse Red 11	2872-48-2		
Disperse Red 17	3179-89-3		
Disperse Yellow 1	119-15-3		
Disperse Yellow 3	2832-40-8		

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Table 1H Substance Group: **Dyes – Disperse (Allergenic) (continued)**

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Disperse Yellow 39	12236-29-2	Textile only: 50	Liquid extraction, LC-MS
Disperse Yellow 49	54824-37-2		
Disperse Yellow 9	6373-73-5		

Table 1I: **Dyes – Navy Blue Colourant**

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing (parameter has been moved to the archive list)
Component 1: C39H23Cl-CrN7O12S 2Na	118685-33-9	Textile and Leather: 500	Liquid extraction, LC-MS
Component 2: C46H-30CrN10O20S2 3Na	Not Allocated		

Table 1J: **Flame Retardants**

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
2,2-bis(bromomethyl)-1,3-propanediol (BBMP)	3296-90-0	Textile and Leather: 25	USEPA 8270E, ISO 22032, USEPA 527 and USEPA 8321B
Bis(2,3-dibromopropyl) phosphate (BIS)	5412-25-9		
Decabromodiphenyl ether (DecaBDE)	1163-19-5		
Hexabromocyclodecane (HBCDD)	3194-55-6		

Table 1J: **Flame Retardants (continued)**

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Octabromodiphenyl ether (OctaBDE)	32536-52-0	Textile and Leather: 25	USEPA 8270, ISO 22032, USEPA 527 and USEPA 8321B
Pentabromodiphenyl ether (PentaBDE)	32534-81-9		
Polybromobiphenyls (PBB)	59536-65-1		
Tetrabromobisphenol A (TBBPA)	79-94-7		
Tris-(2-chloro-1-methylethyl) phosphate (TCPP)	13674-84-5		
Tris(1-aziridinyl)phosphine oxide (TEPA)	545-55-1		
Tris(1,3-dichloro-isopropyl) phosphate (TDCP)	13674-87-8		
Tris(2-chloroethyl) phosphate (TCEP)	115-96-8		
Tris(2,3,-dibromopropyl)-phosphate (TRIS)	126-72-7		
Decabromobiphenyl (DecaBB)	13654-09-6		
Dibromobiphenyls (DiBB)	Multiple		
Octabromobiphenyls (OctaBB)	Multiple		
Dibromopropylether	21850-44-2		
Heptabromodiphenyl ether (HeptaBDE)	68928-80-3		
Hexabromodiphenyl ether (HexaBDE)	36483-60-0		
Monobromobiphenyls (MonoBB)	Multiple		
Monobromodiphenylethers (MonoBDEs)	Multiple		
Nonabromobiphenyls (NonaBB)	Multiple		

Table 1J: Flame Retardants (continued)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Nonabromodiphenyl ether (NonaBDE)	63936-56-1	Textile only: 25	USEPA 8270E, ISO 22032, USEPA 527 and USEPA 8321B Dichloromethane extraction GC-MS or LC-MS(-MS)
Tetrabromodiphenyl ether (TetraBDE)	40088-47-9		
Tribromodiphenylethers (TriBDEs)	Multiple		
Boric acid	10043-35-3 11113-50-1	Textile only: 100 ^c	determined as total boron via ICP
Diboron trioxide	1303-86-2		
Disodium octaborate	12008-41-2		
Disodium tetraborate anhydrous	1303-96-4 1330-43-4		
Tetraboron disodium heptaoxide, hydrate	12267-73-1		

Table 1K: Glycols / Glycol Ethers

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
2-ethoxyethanol	110-80-5	Textile and Leather: 50	USEPA 8270E Liquid extraction, LC-MS GC-MS
2-ethoxyethyl acetate	111-15-9		
2-methoxyethanol	109-86-4		
2-methoxyethylacetate	110-49-6		
2-methoxypropylacetate	70657-70-4		
Bis(2-methoxyethyl)-ether	111-96-6		

^c Limit refers to elemental boron, not the salt.

Table 1K: Glycols / Glycol Ethers (continued)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Ethylene glycol dimethyl ether	110-71-4	Textile and Leather: 50	USEPA 8270E Liquid extraction, LC-MS GC-MS
Triethylene glycol dimethyl ether	112-49-2		

Table 1L: Halogenated Solvents

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
1,2-dichloroethane	107-06-2	Textile and Leather: 1	USEPA 8260D Headspace GC-MS or Purge and trap GC-MS
Methylene chloride	75-09-2		
Tetrachloroethylene	127-18-4		
Trichloroethylene	79-01-6		

Table 1M: Organotin Compounds

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Dipropyltin compounds (DPT)	Multiple	Textile and Leather: 0.01	ISO 17353 Derivatisation with NaB (C2H5)4 GC-MS
Mono-, di- and tri-butyltin derivatives			
Mono-, di- and tri-methyltin derivatives			
Mono-, di- and tri-octyltin derivatives			
Mono-, di- and tri-phenyltin derivatives			
Tetrabutyltin compounds (TeBT)			
Tripropyltin Compounds (TPT)			
Tetraoctyltin compounds (TeOT)			
Tricyclohexyltin (TCyHT)			
Tetraethyltin Compounds (TeET)		ISO 17353	

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Table 1N: Other/Miscellaneous Chemicals

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
AEEA [2-(2-aminoethylamino)ethanol]	111-41-1	Textile and Leather: 500	Liquid extraction, LC-MSMS
Bisphenol A	80-05-7	Textile and Leather: 10	Liquid extraction, LC-MS
Thiourea	62-56-6	Textile and Leather: 50	
Quinoline	91-22-5	Textile and Leather: 50	
Borate, zinc salt	12767-90-7	Textile and Leather: 100 ^d	determined as total boron and total zinc via ICP
Silica* (Used in sand blasting)	14464-46-1	Textile and Leather: N/A	Not a ZDHC Wastewater parameter

Table 1O: Perfluorinated and Polyfluorinated Chemicals (PFCs)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Perfluorooctane sulfonate (PFOS) and related substances, Perfluorooctanoic acid (PFOA)	Multiple	Textile and Leather: 0.01	PFCs: EPA 537:2020 FTOH: BS EN 12673-1999, EPA 8270, PFCs: LC-MSMS FTOH: GC-MS Derivatisation with acetic anhydride followed by GC-MS
Perfluorooctanoic acid (PFOA) related substances		Textile and Leather: 1	

^d Limit refers to boron and zinc individually, not the salt.

* Not required to test this parameter as this is related to sand blasting

Table 1P: Phthalates – including all other esters of ortho-phthalic acid

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
1,2-benzenedicarboxylic acid, di-C6-8 branched and linear alkyl esters, C7-rich (DIHP)	71888-89-6 84777-06-0	Textile and Leather: 10	USEPA 8270E, ISO 18856 Dichloromethane extraction GC-MS
1,2-benzenedicarboxylic acid, di-C7-11 branched and linear alkyl esters (DHNU)	68515-42-4 68515-50-4		
Bis(2-methoxyethyl) phthalate (DMEP)	117-82-8		
Butyl benzyl phthalate (BBP)	85-68-7		
Di-cyclohexyl phthalate (DCHP)	84-61-7		
Di-iso-decyl phthalate (DIDP)	26761-40-0		
Di-iso-octyl phthalate (DIOP)	27554-26-3		
Di-isobutyl phthalate (DIBP)	84-69-5		
Di-isononyl phthalate (DINP)	28553-12-0		
Di-n-hexyl phthalate (DnHP)	84-75-3		
Di-n-octyl phthalate (DNOP)	117-84-0		
Di-n-pentylphthalates	131-18-0		
Di-n-propyl phthalate (DPRP)	131-16-8		
Di(ethylhexyl) phthalate (DEHP)	117-81-7		
Dibutyl phthalate (DBP)	84-74-2		

Table 1P: Phthalates – including all other esters of ortho-phthalic acid (continued)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Diethyl phthalate (DEP)	84-66-2	Textile and Leather: 10	USEPA 8270E, ISO 18856 Dichloromethane extraction GC-MS
Diisopentylphthalates	605-50-5		
Dinonyl phthalate (DNP)	84-76-4		

Table 1Q: Polycyclic Aromatic Hydrocarbons (PAHs)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Acenaphthene	83-32-9	Textile and Leather: 1	USEPA 8270E DIN 38407-39 Solvent extraction GC-MS
Acenaphthylene	208-96-8		
Anthracene	120-12-7		
Benzo[a]anthracene	56-55-3		
Benzo[a]pyrene (BaP)	50-32-8		
Benzo[b]fluoranthene	205-99-2		
Benzo[e]pyrene	192-97-2		
Benzo[ghi]perylene	191-24-2		
Benzo[j]fluoranthene	205-82-3		
Benzo[k]fluoranthene	207-08-9		
Chrysene	218-01-9		
Dibenz[a,h]anthracene	53-70-3		

Table 1Q: Polycyclic Aromatic Hydrocarbons (PAHs) (continued)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Fluoranthene	206-44-0	Textile and Leather: 1	USEPA 8270E DIN 38407-39 Solvent extraction GC-MS
Fluorene	86-73-7		
Indeno[1,2,3-cd]pyrene	193-39-5		
Naphthalene	91-20-3		
Phenanthrene	85-01-8		
Pyrene	129-00-0		

Table 1R: Restricted Aromatic Amines (Cleavable from Azo-colourants)^f

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
2-naphthylamine	91-59-8	Textile and Leather: 0.1	Reduction step with sodium dithionite, solvent extraction EPA 8270
2-Naphthylammoniumacetate	553-00-4		
2,4-xylidine	95-68-1		
2,4,5-trimethylaniline	137-17-7		
2,4,5-trimethylaniline hydrochloride	21436-97-5		
2,6-xylidine	87-62-7		
3,3'-dichlorobenzidine	91-94-1		
3,3-dimethoxybenzidine	119-90-4		
3,3-dimethylbenzidine	119-93-7		

^f Previously referred to as 'Dyes – Azo (Forming Restricted Amines).'

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Table 1R: Restricted Aromatic Amines (Cleavable from Azo-colourants)^f (continued)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
4-aminoazobenzene	60-09-3	Textile and Leather: 0.1	Reduction step with sodium dithionite, solvent extraction EPA 8270E and ISO 14362-1 GC/MS and LC/MS/MS
4-aminodiphenyl	92-67-1		
4-chloro-o-toluidine	95-69-2		
4-chloro-o-toluidinium chloride	3165-93-3		
4-chloroaniline	106-47-8		
4-methoxy-m-phenylene diammonium sulphate; 2,4-diaminoanisole sulphate	39156-41-7		
4-methoxy-m-phenylenediamine	615-05-4		
4-methyl-m-phenylenediamine	95-80-7		
4,4-methylene-bis-(2-chloro-aniline)	101-14-4		
4,4-methylenedi-o-toluidine	838-88-0		
4,4-methylenedianiline	101-77-9		
4,4-oxydianiline	101-80-4		
4,4-thiodianiline	139-65-1		
5-nitro-o-toluidine	99-55-8		
6-methoxy-m-toluidine	120-71-8		
Benzidine	92-87-5		
o-aminoazotoluene	97-56-3		
o-anisidine	90-04-0		
o-toluidine	95-53-4		

^f Previously referred to as 'Dyes – Azo (Forming Restricted Amines).'

Table 1S: UV Absorbers

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl) phenol (UV-350)	36437-37-3	Textile and Leather: 100	USEPA 8270 ISO 22032, USEPA 527 and USEPA 8321B. Dichloromethane extraction GC-MS or LC-MS(-MS)
2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1		
2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7		
2,4-Di-tert-butyl-6-(5-chlorobenzotriazole-2-yl) phenol (UV-327)	3864-99-1		

Table 1T: Volatile Organic Compounds (VOC)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
Benzene	71-43-2	Textile and Leather: 1	ISO 11423-1 Headspace or Purge and trap GC-MS USEPA 8260D Add ISO 20595 Static headspace for determination of VOC in wastewater
m-cresol	108-39-4		ISO 11423-1 Headspace or Purge and trap GC-MS EPA 8270 BS EN 12673-1999

Table 1T: Volatile Organic Compounds (VOC) (continued)

Substance	CAS Number	Reporting Limit (µg/L)	Standard Method for Analysis/Testing
o-cresol	95-48-7	Textile and Leather: 1	ISO 11423-1 Headspace or Purge and trap GC-MS EPA 8270 BS EN 12673-1999
p-cresol	106-44-5		
Xylene	1330-20-7	Textile only: 1	ISO 11423-1 Headspace or Purge and trap GC-MS USEPA 8260D
Toluene ⁹	108-88-3	Textile only: 1	HJ 1067 or EPA 8260D or ISO 11423-1

⁹ Sample and Report only for mock leather.

4. ZDHC Heavy Metals Wastewater Parameters and Limits, Table 2

Parameter	Unit	Parameter limit values			Standard methods for analysis and testing Equivalent methods can be used if approved by ZDHC			
		Wastewater Foundational	Wastewater Progressive	Wastewater Aspirational	International/ Europe	USA	China	India
Antimony ^a	mg/L	Textile and Leather: 0.1	Textile and Leather: 0.05	Textile and Leather: 0.01	ISO 17294	USEPA 200.8 USEPA 6010C USEPA 6020A	HJ 700	IS 3025 (Part 65)
Chromium (VI)	mg/L	Textile: 0.05 Leather: 0.15	Textile: 0.005 Leather: 0.05	Textile: 0.001 Leather: 0.02	ISO 18412	USEPA 218.6	GB 7467	IS 3025 (Part 52) must meet reporting limit
Barium	mg/L	Textile: Sample and report only				EPA 200.8 EPA 6010C EPA 6020A	HJ 700	
Selenium	mg/L							
Tin	mg/L							

^a For polyester wet processing facilities Foundational, Progressive and Aspirational limits do not yet apply (unless required by law or voluntarily adopted), however facilities must continue to sample and report on the Antimony parameter. ZDHC intends to introduce these limits for Polyester wet processing facilities by 2025 which can be met by adopting antimony-free polyester and/or mitigation technologies.

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Table 2:
Heavy Metals
(continued)

Parameter	Unit	Parameter limit values			Standard methods for analysis and testing Equivalent methods can be used if approved by ZDHC			
		Wastewater Foundational	Wastewater Progressive	Wastewater Aspirational	International/ Europe	USA	China	India
Arsenic	mg/L	Textile and Leather: 0.05	Textile and Leather: 0.01	Textile and Leather: 0.005	ISO 17294	USEPA 200.8 USEPA 6010C USEPA 6020A	HJ 700	IS 3025 (Part 65)
Chromium, total	mg/L	Textile: 0.2 Leather: 1.5	Textile: 0.1 Leather: 0.8	Textile: 0.05 Leather: 0.3				IS 3025 (Part 65)
Cobalt	mg/L	Textile and Leather: 0.05	Textile and Leather: 0.02	Textile and Leather: 0.01				IS 3025 (Part 65) IS 3025 (Part 41) AAS Instrumental Method
Cadmium	mg/L	Textile and Leather: 0.1	Textile and Leather: 0.05	Textile and Leather: 0.01				IS 3025 (Part 65) IS 3025 (Part 42) AAS Instrumental Method
Copper	mg/L	Textile and Leather: 1	Textile and Leather: 0.5	Textile and Leather: 0.25				IS 3025 (Part 65) IS 3025 (Part 47) AAS Instrumental Method
Lead	mg/L	Textile and Leather: 0.1	Textile and Leather: 0.05	Textile and Leather: 0.01				IS 3025 (Part 65) IS 3025 (Part 54) AAS Instrumental Method
Nickel	mg/L	Textile and Leather: 0.2	Textile and Leather: 0.1	Textile and Leather: 0.05				IS 3025 (Part 65)
Silver	mg/L	Textile and Leather: 0.1	Textile and Leather: 0.05	Textile and Leather: 0.005				IS 3025 (Part 65) IS 3025 (Part 49) AAS Instrumental Method
Zinc	mg/L	Textile and Leather: 5	Textile and Leather: 1	Textile and Leather: 0.5				IS 3025 (Part 65) IS 3025 part 48 cold vapor AAS only, IS 3025 part 65-SI
Mercury	mg/L	Textile and Leather: 0.01	Textile and Leather: 0.005	Textile and Leather: 0.001				ISO 17294

5. ZDHC Conventional Parameters and Anions for Wastewater, Table 3

Parameter	Unit	Parameter limit values			Standard methods for analysis and testing Equivalent methods can be used if approved by ZDHC			
		Wastewater Foundational	Wastewater Progressive	Wastewater Aspirational	International/ Europe	USA	China	India
Conventional Parameters (Testing conducted during sample collection for pH, Temperature difference, Persistent Foam, Wastewater flowrate, DO, Total Chlorine)								
pH ^a	pH	Textile and Leather: 6 - 9			ISO 10523	USEPA 150.1 SM 4500-H+	HJ 1147	IS 3025 (Part 11) Electrometric method only
Temperature difference ^b	°C	Δ+15	Δ+10	Δ+5	DIN 38 404-4 or equivalent	USEPA 170.1 SM 2550	GB/T 13195	IS 3025 (Part 9)
E.coli	CFU/100-ml	Textile and Leather: 126 CFU/100-ml				SM 9222G presumptive, confirm positive with SM9222G		
Colour ^c (436nm; 525nm; 620nm)	m-1	Textile and Leather: 7; 5; 3 5; 3; 2 2; 1; 1			ISO 7887-B			
Persistent Foam ^d		Textile and Leather: No indication of Persistent foam in receiving water			N/A			
Wastewater Flowrate ^a	15m ³ per day							

^a These tests are to be done on-site by the sampler.

^b Take the temperature of the discharged wastewater and the receiving body of water upstream. Subtract the temperature of the receiving body from the temperature of the discharge to give the delta temperature difference, which can be a positive or a negative value. The discharge limits only refer to a positive value, which produces an overall increase in the temperature of the receiving body of water. This test is to be done on-site by the sampler and is applicable only for direct discharge.

^c Colour must be tested and reported in accordance with standard method ISO 7887-B for ZDHC testing purposes. Local regulations may require an additional test method.

^d Foam is a naturally occurring phenomenon in aeration basins in which biological wastewater treatment occurs. Samplers should include photographs of the foam they witnessed in the final lab report, along with the time and date of taking such photos. The foam colour should be similar to the liquid in the aeration basin, should dissipate quickly, and should be contained within the aeration basin. If the foam is higher than 45 centimetres (by visual estimation) then it could result in permanent foam being discharged onto the surface of receiving waters and should be noted. For direct discharge facilities samplers should check for persistent foam on the surface of receiving waters at the point of discharge and the presence or absence of foam should be noted. This should be checked at the same location used for sampling the temperature difference. This test is to be done on-site by the sampler and should be checked at the same location used for ΔT sample checks.

Table 3: Conventional Parameters and Anions for Wastewater (continued)

Parameter	Unit	Parameter limit values			Standard methods for analysis and testing Equivalent methods can be used if approved by ZDHC			
		Wastewater Foundational	Wastewater Progressive	Wastewater Aspirational	International/ Europe	USA	China	India
Conventional Parameters (Testing conducted during sample collection for pH, Temperature difference, Persistent Foam, Wastewater flowrate, DO, Total Chlorine)								
Ammonium-Nitrogen	mg/L	Textile: 10 Leather: 15	Textile: 1 Leather: 10	Textile: 0.5 Leather: 1	ISO 11732 ISO 7150	USEPA 350.1 USEPA 350.3 SM 4500 NH3 - D, E, F, G, or H	HJ 535	IS 3025 (Part 34) phenate or ammonia selective electrode only
AOX	mg/L	Textile only: 3	Textile only: 0.5	Textile only: 0.1	ISO 9562	HACH LCK 390 Merck 1.00675.0001	HJ/T 83-2001	
Biochemical Oxygen Demand 5-days concentration (BOD ₅)	mg/L	Textile: 30 Leather: 50	Textile: 15 Leather: 30	Textile: 8 Leather: 20	ISO 5815-1	USEPA 405.1 SM 5210-B	HJ 505	IS 3035 (Part 44) seeded dilution water (BOD ₅)
Chemical Oxygen Demand (COD)	mg/L	Textile: 150 Leather: 250	Textile: 80 Leather: 150	Textile: 40 Leather: 100	ISO 6060* ISO 15705	USEPA 410.4 SM 5220-D	HJ 828 GB/T 11914 e	IS 3025 (Part 58) e
Dissolved Oxygen (DO) ^a	mg/L	Textile and Leather: Sample and report only			ISO 5814	EPA 360.1 SM 4500-O-G	HJ 506	
Oil & Grease	mg/L	Textile: 10 Leather: 20	Textile: 2 Leather: 10	Textile: 0.5 Leather: 5	ISO 9377-2	SM 5520-B/C USEPA 1664 revision B	HJ 637 (total oil and grease)	IS 3025 (Part 39) partition gravimetric or partition Infra-red
Total Phenols / Phenol Index	mg/L	Textile and Leather: 0.5	Textile: 0.01 Leather: 0.3	Textile: 0.001 Leather: 0.1	ISO 6439	SM 5530-B/C	HJ 503 must meet required reporting limit	IS 3025 (Part 43)
Total Chlorine ^a	mg/L	Textile and Leather: Sample and report only			ISO 7393-2	EPA 330.5 SM4500-Cl-G	HJ 586	
Total Dissolved Solids (TDS) ^f	mg/L	Textile and Leather: Sample and report only				SM 2540-C USEPA 160.1	GB/T 5750.4-2006 180°C (180 degree centigrade)	IS 3025 (Part 16) 179°C to 181°C

^a These tests are to be done on-site by the sampler.
^e Validated cuvette methods can be used alternatively.

^f Salt that is deliberately used in wet processing or that is formed as a result of neutralisation reactions, and that is not remediated by a standard ETP, can negatively affect the aquatic environment when discharged. To promote less deliberate use and formation of salt, it is intended to introduce a requirement for Total Dissolved Solids (TDS) to be measured and reported, prior to the introduction of a limit.

Table 3: Conventional Parameters and Anions for Wastewater (continued)

Parameter	Unit	Parameter limit values			Standard methods for analysis and testing Equivalent methods can be used if approved by ZDHC			
		Wastewater Foundational	Wastewater Progressive	Wastewater Aspirational	International/ Europe	USA	China	India
Conventional Parameters (Testing conducted during sample collection for pH, Temperature difference, Persistent Foam, Wastewater flowrate, DO, Total Chlorine)								
Total Nitrogen	mg/L	Textile: 20 Leather: 35	Textile: 10 Leather: 20	Textile: 5 Leather: 10	ISO 11905 - Part 1 ISO 29441	USEPA 351.2 SM 4500P-J SM 4500N-B SM 4500N-C	HJ 636	IS 3025 (Part 34) measure and total all forms of nitrogen (ammonia, nitrate, nitrite, organic)
Total Phosphorus	mg/L	Textile and Leather: 3	Textile: 0.5 Leather: 1	Textile: 0.1 Leather: 0.5	ISO 17294 ISO 11885 ISO 6878	USEPA 365.4 SM 4500P-J USEPA 200.7 USEPA 200.8 USEPA 6010C USEPA 6020A	GB/T 11893	IS 3025 (Part 31) IS 3025 (Part 65)
Total Suspended Solids (TSS)	mg/L	Textile: 50 Leather: 70	Textile: 15 Leather: 50	Textile: 5 Leather: 20	ISO 11923	USEPA 160.2 SM 2540D	GB/T 11901	IS 3025 (Part 17) 103°C to 105°C
Anions								
Chloride	mg/L	Textile and Leather: Sample and report only			ISO 10304-1 ISO 15923-1	SM 4110-B SM 4110-C SM 4500-Cl D or E USEPA 300	HJ 84-2016	IS 3025 (Part 32) potentiometric or automated ferricyanide only
Cyanide, total	mg/L	Textile only: 0.2	Textile only: 0.1	Textile only: 0.05	ISO 6703-1,-2,-3, ISO 14403-1,-2	USEPA 335.2, APHA 4500-CN	HJ 484	
Sulfate	mg/L	Textile and Leather: Sample and report only			ISO 10304-1 ISO 15923-1	SM 4500 SO ₄ , E, F, G SM 4100 B, C USEPA 300 USEPA 9038	HJ 84-2016	IS 3025 (Part 24)
Sulfide	mg/L	Textile: 0.5 Leather: 1	Textile: 0.05 Leather: 0.5	Textile: 0.01 Leather: 0.2	ISO 10530	SM 4500-S2-D, E, G, or I	HJ 1226	IS 3025 (Part 29) Methylene blue only
Sulfite	mg/L	Textile only: 2	Textile only: 0.5	Textile only: 0.2	ISO 10304-3	SM 4500-SO ₃ 2-C	HJ 84-2016	

6. ZDHC Sludge Disposal Pathways, Parameters and Limits, Table 4A-4C

Table 4A: Sludge Parameters

STEP 1: All must test the following parameters.							
Parameters	Reporting Limit (mg/kg-Dry Weight)	Standard Method for Sludge Analysis/Testing Total Metals Equivalent methods can be used if approved by ZDHC					
		Description of Lab Method	International/ Europe	USA	China	India	
Metals							
Antimony	Textile only: 5	Preparation: Acid/peroxide digestion Analysis: ICP/OES, or ICP/MS		Preparation: EPA 3050 EPA 3051A Analysis: EPA 6010D, EPA 200.8 or EPA 6020B			
Arsenic	Textile: 5 Leather: 2					HJ 803	
Barium	Textile only: 200						
Cadmium	Textile: 1 Leather: 2						
Cobalt	Textile only: 400						
Copper	Textile only: 50						HJ 803
Lead	Textile: 5 Leather: 2						
Nickel	Textile only: 20						

Table 4A: Sludge Parameters (continued)

STEP 1: All must test the following parameters.

STEP 1: All must test the following parameters.						
Parameters	Reporting Limit (mg/kg-Dry Weight)	Standard Method for Sludge Analysis/Testing Total Metals Equivalent methods can be used if approved by ZDHC				
		Description of Lab Method	International/ Europe	USA	China	India
Metals (continued)						
Selenium	Textile only: 5	Preparation: Acid/peroxide digestion Analysis: ICP/OES, or ICP/MS		Preparation: EPA 3050 EPA 3051A Analysis: EPA 6010D, EPA 200.8 or EPA 6020B	HJ 803	
Silver	Textile only: 50					
Total Chromium	Textile only: 50					
Zinc	Textile only: 400					
Chromium (VI)	Textile: 20 Leather: 2	Preparation: Alkaline digestion Analysis: Colourimetric UV/VIS, or Colourimetric IC		Preparation: USEPA 3060a EPA 3051A Analysis: USEPA 7196, EPA 200.8 or USEPA 7199	HJ 1082	
Mercury	Textile: 1 Leather: 0.2	Preparation: Dissolution, acid digestion Analysis: CVAA or ICP MS	EPA 7473	Preparation: EPA 7471 b, EPA 3051A or EPA 3051a Analysis: EPA 7471b, EPA 200.8 or 6020b	GB/T 22105.1 HJ 923	
Anions						
Cyanide	Textile only: 20	Preparation: CN converted to HCN by reflux-distillation to NaOH Analysis: Colourimetry (EPA 9014), or ISE (EPA 9213)		Preparation: USEPA 9013 Analysis: EPA 9014 or EPA 9213	HJ 745	
Conventional						
pH		Preparation: Suspension with Water Analysis: ISE		Preparation and Analysis: EPA SW 9045D or HJ962	HJ 962	

Table 4A: Sludge Parameters (continued)

STEP 1: All must test the following parameters.

STEP 1: All must test the following parameters.						
Parameters	Reporting Limit (mg/kg-Dry Weight)	Standard Method for Sludge Analysis/Testing Total Metals Equivalent methods can be used if approved by ZDHC				
		Description of Lab Method	International/ Europe	USA	China	India
Conventional (continued)						
% Solids		Analysis: Dry at 105°C		Analysis: EPA 160.3, HJ613 at 105°C	HJ 613 drying at 105°C	
Paint Filter Test				Analysis: EPA SW-846 or EPA 9095B		
Fecal Coliform		Preparation: Blended suspension Analysis: Multiple Tube Fermentation		Analysis: EPA 1681		
MRSLS						
Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs): including all isomers	Textile and Leather: 0.4	Preparation: Modified dichloromethane extraction with mechanical agitation, soxhlet, or ultrasonic Analysis: NP/OP, GC-MS, LC-MS Analysis: OPEO/NPEO (n>2): GC-MS; LC-MS	Analysis: NP/OP ISO 18857-2; ASTM D7065 OPEO/NPEO n>2 ISO 18254-1	Preparation: USEPA 3540/3541 soxhlet USEPA 3550 ultrasonic		
Polycyclic Aromatic Hydrocarbons (PAHs)	Textile only: 0.2	Preparation: Dichloromethane extraction with mechanical agitation, soxhlet, or ultrasonic		Preparation: USEPA 3540/3541 soxhlet USEPA 3550 ultrasonic	HJ 805-2016	
Chlorotoluenes (only)	Textile and Leather: 0.2	Clean up: GPC Analysis: GC-MS		Clean up: USEPA 3640 Analysis: USEPA 827	HJ 605	

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Table 4B: Sludge Parameters (continued)

STEP 2: Evaluate if the Total Metals sampled and tested in Step 1, exceed the Total Metals Threshold Values (mg/kg) given in this column. If so proceed with Leachate testing.

STEP 3: If Total Metals Threshold Values (mg/kg) given in this column are not exceeded, any disposal pathway for your sludge tested is acceptable.

STEP 2: Leachate limits must be met if Total Metal Threshold Values (mg/kg) are exceeded.														
Parameters	Total Metals and Anions Threshold Values (mg/kg) ^a	Disposal Pathways							Standard Methods for TCLP Analysis / Testing Equivalent methods can be used if approved by ZDHC					
		A Offsite Incineration at >1000°C	C Building Products Processed at >1000°C	D Landfill with Limited Control Measures	E Offsite Incineration and Building Products Processed at <1000°C	F Landfill with No Control Measures	G Land Application							
		Leachate result (TCLP) in mg/L							Max Total Metals limit (mg/kg)	Description of Lab Method	International/ Europe	USA	China	India
Arsenic	10		5	2.75	0.5	0.5	0.5	75						
Cadmium	3		1	0.58	0.15	0.15	0.15	85	Leachate Extraction: Toxicity Leachate Extraction Procedure Preparation: Acid Digestion EPA 3051A Analysis: ICP/OES, ICP/MS or EPA 200.8	ISO 11885 ISO 17294-2	Leachate Extraction: EPA 1311 Analysis: USEPA 200.7 USEPA 200.8 USEPA 6010c USEPA 6020a			
Total Chromium	100		15	10	5	5	5	3000						
Lead	10	Report Only if Required to Test	5	2.75	0.5	0.5	0.5	840						
Antimony	12		15	7.8	0.6	0.6	0.6							
Barium	700		100	67.5	35	35	35	Sample and Report Only						
Cobalt	1600		80	80	80	80	80							

^a Digested and analysed for total metals.

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Table 4B: Sludge Parameters (continued)

STEP 2: Evaluate if the Total Metals sampled and tested in Step 1, exceed the Total Metals Threshold Values (mg/kg) given in this column. If so proceed with Leachate testing.

STEP 3: If Total Metals Threshold Values (mg/kg) given in this column are not exceeded, any disposal pathway for your sludge tested is acceptable.

STEP 2: Leachate limits must be met if Total Metal Threshold Values (mg/kg) are exceeded.															
Parameters	Total Metals and Anions Threshold Values (mg/kg) ^a	Disposal Pathways							G Land Application	Standard Methods for TCLP Analysis / Testing Equivalent methods can be used if approved by ZDHC					
		A Offsite Incineration at >1000°C	B Landfill with Significant Control Measures	C Building Products Processed at >1000°C	D Landfill with Limited Control Measures	E Offsite Incineration and Building Products Processed at <1000°C	F Landfill with No Control Measures	Leachate result (TCLP) in mg/L		Max Total Metals limit (mg/kg)	Description of Lab Method	International/ Europe	USA	China	India
Copper	200			25	17.5	10	10	10	4300	Leachate Extraction: Toxicity Leachate Extraction Procedure Preparation: Acid Digestion EPA 3051A Analysis: ICP/OES, ICP/MS or EPA 200.8	ISO 11885 ISO 17294-2	Leachate Extraction: EPA 1311 Analysis: USEPA 200.7 USEPA 200.8 USEPA 6010c USEPA 6020a			
Nickel	70			20	11.75	3.5	3.5	3.5	420						
Selenium	10			1	0.75	0.5	0.5	0.5	100						
Silver	100	Report Only if Required to Test		5	5	5	5	5	Sample and Report Only						
Zinc	1000			250	150	50	50	50	7500						
Chromium (VI)	50			5	3.75	2.5	2.5	2.5	50	Preparation: Alkaline digestion EPA 3051A Analysis: Colourimetric UV/VIS, Colourimetric IC or EPA 200.8	ISO 18412	Preparation: USEPA 3060a Analysis: USEPA 7196 or USEPA 7199			

^a Digested and analysed for total metals.

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Table 4B: Sludge Parameters (continued)

STEP 2: Evaluate if the Total Metals sampled and tested in Step 1, exceed the Total Metals Threshold Values (mg/kg) given in this column. If so proceed with Leachate testing.

STEP 3: If Total Metals Threshold Values (mg/kg) given in this column are not exceeded, any disposal pathway for your sludge tested is acceptable.

STEP 2: Leachate limits must be met if Total Metal Threshold Values (mg/kg) are exceeded.														
Parameters	Total Metals and Anions Threshold Values (mg/kg) ^a	Disposal Pathways							Standard Methods for TCLP Analysis / Testing Equivalent methods can be used if approved by ZDHC					
		A Offsite Incineration at >1000°C	B Landfill with Significant Control Measures	C Building Products Processed at >1000°C	D Landfill with Limited Control Measures	E Offsite Incineration and Building Products Processed at <1000°C	F Landfill with No Control Measures	G Land Application						
		Leachate result (TCLP) in mg/L							Max Total Metals limit (mg/kg)	Description of Lab Method	International/ Europe	USA	China	India
Mercury	1	Report Only if Required to Test	0.2	0.125	0.05	0.05	0.05	57	Preparation: Dissolution, acid digestion EPA 3051A Analysis: CVAA, ICP MS or EPA 200.8	ISO 12846 or ISO 17852	Preparation: EPA 7471b, or EPA 3051a Analysis: EPA 7471b, or 6020b			

^a Digested and analysed for total metals.

Table 4C: Sludge Parameters (continued)

Corresponding Conventional and Organic ZDHC MRSL limits for specific Disposal Pathways for Textile and Leather.						
Parameters	A Offsite Incineration at >1000°C	C Building Products Processed at >1000°C	D Landfill with Limited Control Measures	E Offsite Incineration and Building Products Processed at <1000°C	F Landfill with No Control Measures	G Land Application
	B Landfill with Significant Control Measures	Test Results				
pH		5 - 11 s.u	5 - 11 s.u	5 - 11 s.u	6.5 - 9 s.u.	6.5 - 9 s.u.
% Solids	Sample and Report Only	Sample and Report Only	Sample and Report Only	Sample and Report Only	Sample and Report Only	Sample and Report Only
Fecal Coliform					<1,000 (MPN/g)	
Paint Filter Test			Pass Paint Filter Test	Pass Paint Filter Test	Sample and Report Only	
Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs): including all isomers			< 0.4 mg/kg			
Polycyclic Aromatic Hydrocarbons (PAHs)			< 0.2 mg/kg			
Chlorotoluenes (only)						

7. ZDHC Wastewater Candidate List, Table 5

Parameter	Intention for Restrictions
ZDHC MRSL V2.0 candidate list	<p>The following chemicals, that are on the ZDHC MRSL V2.0 candidate list, are likely to be added to the main ZDHC MRSL list in future updates and are therefore likely to be added to the Wastewater Guidelines in future updates. It is advisable to check chemical inputs and wastewater for their presence and avoid their use where possible.</p> <p>Aniline C.I. Basic Green 4 Leuco Base Trixylyl phosphate Tri-o-cresyl phosphate Trimethyl phosphate All PFCs / PFAS</p> <p>Other chemicals on the ZDHC MRSL V2.0 candidate list are also likely to be added to the main ZDHC MRSL list in future updates but, at the time of publication of this document, it is less certain that they will require mandatory testing in wastewater.</p>
Microfibres	<p>Natural and synthetic textile fibres can fragment during wet processing and finishing and then enter the aquatic environment. Once size distribution studies are completed, and a reliable test method is developed, it is intended to introduce a requirement for microfibres/fibre fragment discharge to be measured and reported before introducing a limit.</p>
Water Consumption	<p>Over-abstraction and over-use of water should be avoided to preserve freshwater supplies. Additionally, reducing water consumption tends to result in a reduction of energy and chemical consumption. WW Guideline limits must be met by controlling chemical inputs and appropriate remediation without dilution. In the future, ZDHC may require reports of total water usage before introducing sector-specific water use targets.</p>
Effluent Toxicity	<p>The WW Guidelines consider many different chemicals and conventional parameters, but the list is not exhaustive. To reduce the risk of chemicals that are not listed causing problems, ZDHC may introduce a check for effluent toxicity to provide extra reassurance.</p>
Smart, Intelligent Testing	<p>WW Guidelines requires that all ZDHC MRSL, Conventional (inc. anions), and metals are tested twice per year. In the future, ZDHC intends to use reliable test data and past facility performance information to create a framework where an intelligent testing programme targets risks and eliminates test redundancy. This may include an intelligent testing programme based on factors including ZDHC MRSL conformance of chemical inputs (InCheck), performance test history (ClearStream) and product and process-specific risks to improve efficiency and ease of roll-out of the ZDHC Roadmap to Zero Programme.</p>

8. Wastewater Discharge Types and Sample Locations

Figure 2a: Schematic illustration of the Sample Locations for a Direct Discharge Supplier. **Sampling locations:** Untreated Wastewater, Effluent, Sludge.

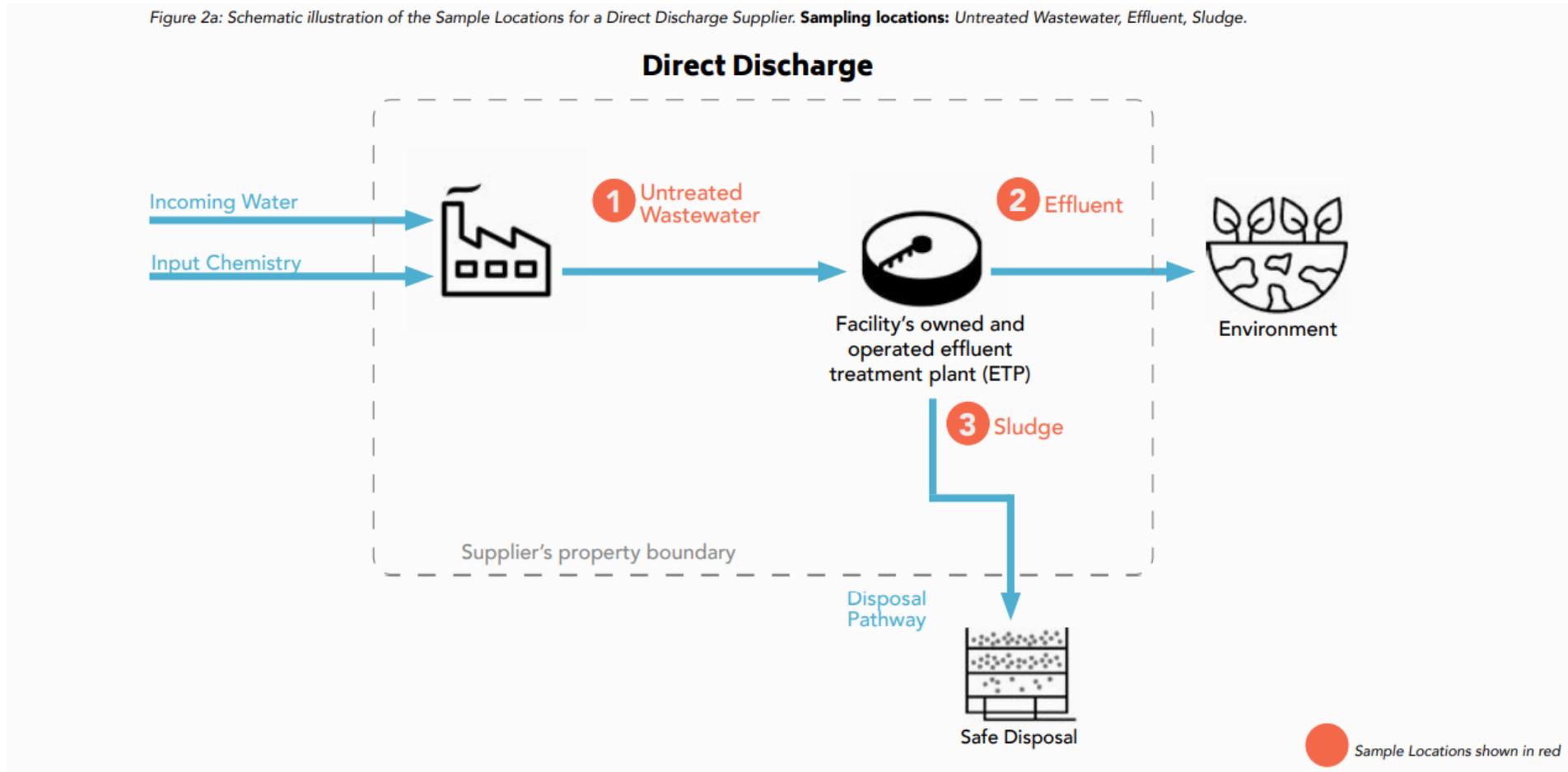


Figure 2b: Schematic illustration of the Sample Locations for an Indirect Discharge with pretreatment Supplier. **Sampling locations:** Untreated Wastewater, Effluent, Sludge.

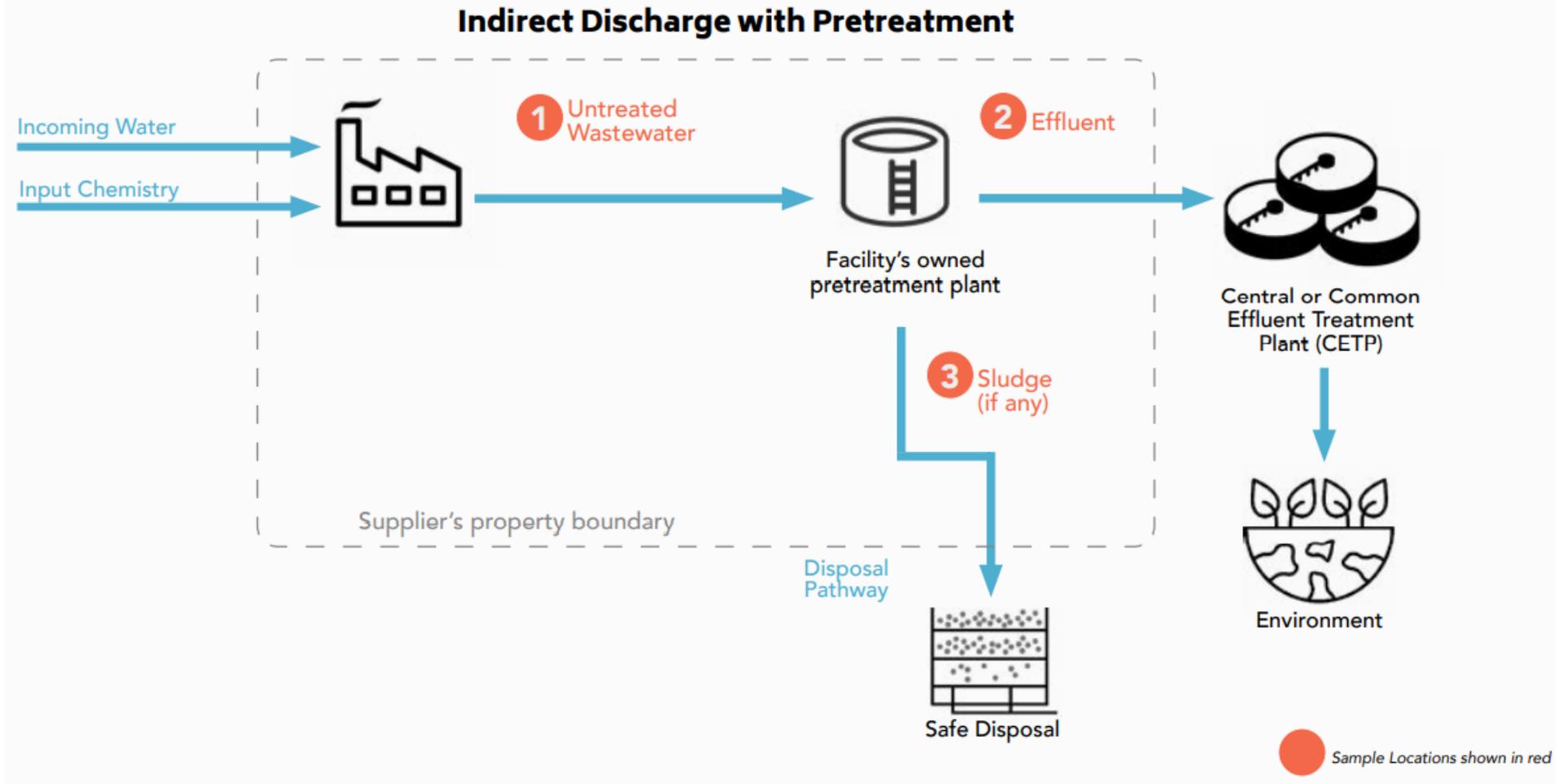


Figure 2c: Schematic illustration of the Sample Locations for an Indirect Discharge without pretreatment Supplier. **Sampling locations:** Untreated Wastewater.

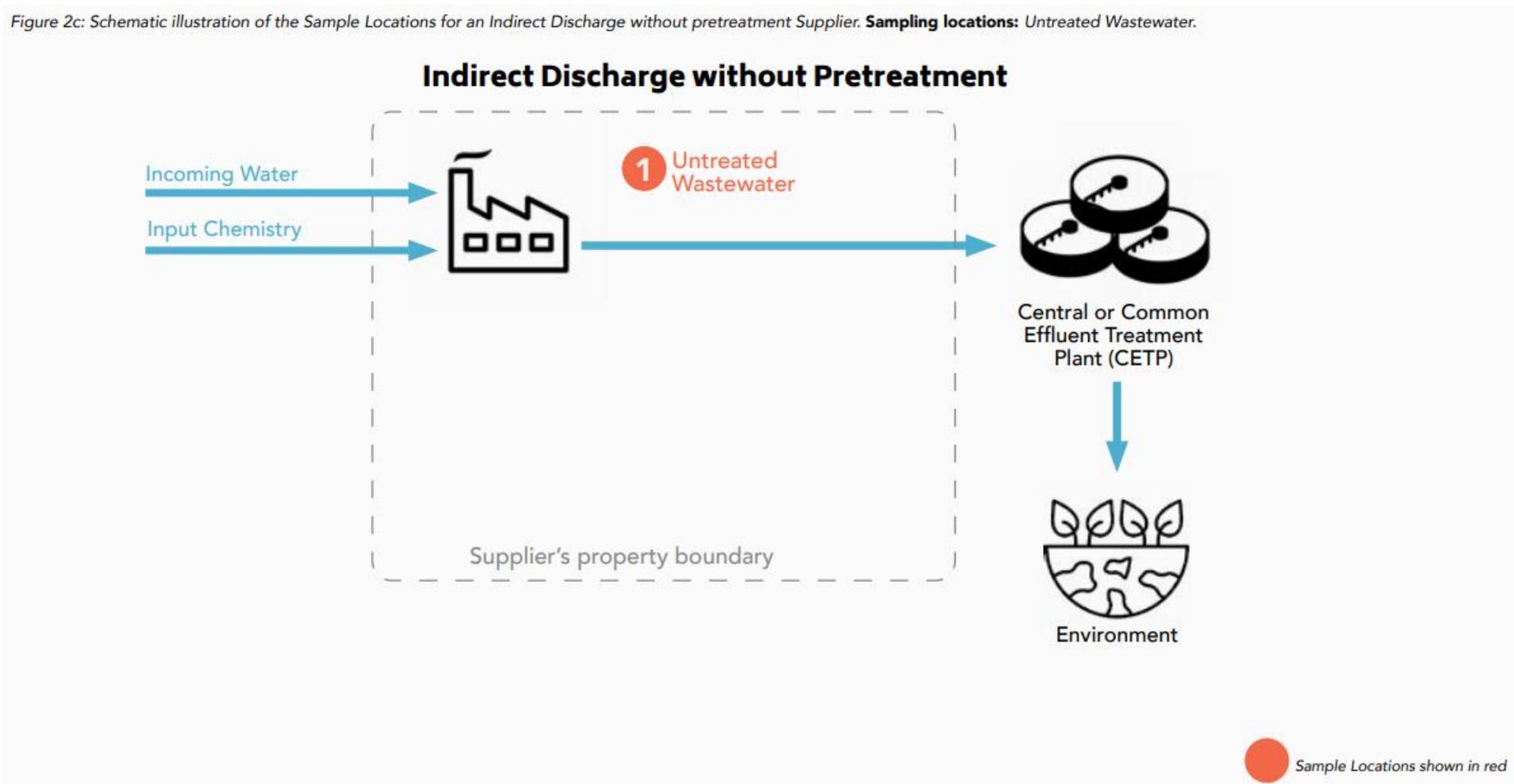
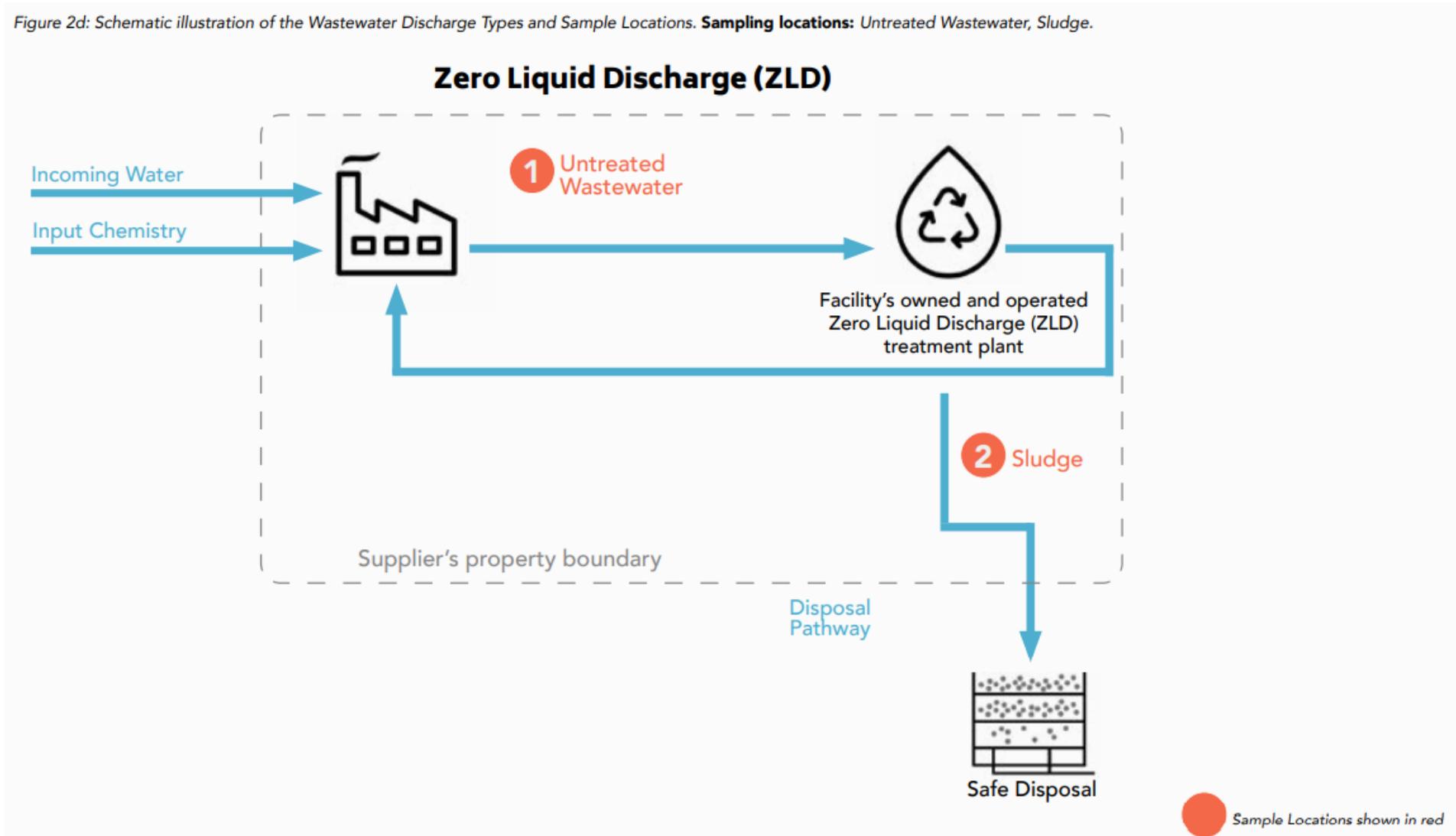


Figure 2d: Schematic illustration of the Wastewater Discharge Types and Sample Locations. **Sampling locations:** Untreated Wastewater, Sludge.



9. What and Where to Sample and Test as Part of ZDHC Wastewater Guidelines?

Table 7

Suppliers that generate on average, equal to, or more than 15m ³ of industrial wastewater per day				
Test parameters and sample locations/ discharge types	ZDHC MRSL ⁷	ZDHC Heavy Metals	ZDHC Conventional and Anions	ZDHC Sludge
	Sample untreated wastewater and test Tables 1A-1T parameters	Sample effluent and test Table 2 parameters	Sample effluent and test Table 3 parameters	Sample sludge and test Table 4 parameters
Direct	Sample and test	Sample treated effluent and test	Sample and test	Sample and test against the chosen ZDHC sludge disposal pathway in accordance with the ZDHC Sludge Guideline
Indirect with pretreatment	Sample and test	Sample pre-treated effluent and only test ⁸ the following: Arsenic, Cadmium, Chromium (VI), Lead, Mercury	No sample or testing required	Sample and test against the chosen ZDHC sludge disposal pathway in accordance with the ZDHC Sludge Guideline
Indirect without pretreatment	Sample and test ⁹	Sample and only test ¹⁰ the following: Arsenic, Cadmium, Chromium (VI), Lead, Mercury	No sample or testing required	Not applicable, no sample or testing required
ZLD	Sample and test	No sample or testing required	No sample or testing required	Sample and test against the chosen ZDHC sludge disposal pathway in accordance with the ZDHC Sludge Guideline

⁶ From any wet processing and/or from any operation such as rinsing screens, tools or equipment wash. This includes but is not limited to sizing, desizing, pretreatment, dyeing, printing (including digital printing), finishing, laundry, non-woven manufacturing using hydro entanglement, etc.

⁷ Excluding Heavy Metals.

⁸ RCA/ CAP in the event of a detection.

⁹ Composite sample is must.

¹⁰ Composite sample is must. RCA/ CAP in the event of a detection.

Table 8

Suppliers that generate on average, less than 15m ³ of industrial wastewater per day				
Test parameters and sample locations/ discharge types	ZDHC MRSL ¹¹	ZDHC Heavy Metals	ZDHC Conventional and Anions	ZDHC Sludge
	Sample untreated wastewater and test Tables 1A-1T parameters	Sample effluent and test Table 2 parameters	Sample effluent and test Table 3 parameters	Sample sludge and test Table 4 parameters
Direct	No sample or testing required	Sample and test	Sample and test	No sample or testing required
Indirect with pretreatment	No sample or testing required	No sample or testing required	No sample or testing required	No sample or testing required
Indirect without pretreatment	No sample or testing required	No sample or testing required	No sample or testing required	No sample or testing required
ZLD	No sample or testing required	No sample or testing required	No sample or testing required	No sample or testing required

¹¹ Excluding Heavy Metals.