



**Sustainable Leather Foundation
Standard for Effluent and Water Quality**

Reference: FSE11.1

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Accredited by: XXX

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EFFLUENT AND WATER OUTPUT QUALITY STANDARD AND BENCHMARK

Summary: The SLF water output quality standard provides the context, audit of water quality, and provides the facility under audit the methodology to analyse and report their water quality to an interested party ensuring the reporting of water output quality, and such that the environmental impact and comparisons of the facilities' use can be compared to global levels and to other facilities of similar size and type.



1. Scope

This Standard defines the final effluent pollutant levels when releasing effluent to final water bodies (e.g., lakes and rivers). Buljan and Král (2019) helps to set benchmarks for the release of pollutants into natural bodies these include metals, salinity, oxygen demand, fats/oils/grease, solid content, colour, pH, nitrogen, and sulfide – some of these have been incorporated as benchmarks in this Standard.

The Scope of this audit includes all facilities in the value chain that treats the facility water output till it is released into the environment (marine, river, lake, land irrigation, or evaporation release). It is the responsibility of the facility (that generates the water pollution), primarily, but also the third parties to be held accountable for the final values against which the benchmarks will be applied. If the third parties are not meeting the benchmarks, then the generating facility should be making alternative arrangements to deal with their pollution.

The method and definition of water output quality for facilities in the leather value chain is included in this Standard. The facilities in the value chain include all facilities from the farm to the end-of-life of the leather.

The Standard on water output quality includes all outputs of substances by means of travel by water out of the facilities (including their sub-contractors, and waste handling/treatment vendors) into the surrounding environment. The water output quality in question is only related to the Scope of the SLF audit (or mapped certification) that is being audited. The Scope of the Water Output Standard does not include indirect water quality emissions that are related to the preparation of inputs - that are then used on the site (included within the Scope of the audit).

This Standard does acknowledge that there are other restricted substances in facility effluents, but the evidence for the proposed limits set by industry bodies is not clear. Future updates of this Standard will contain restricted substance benchmarks. SLF acknowledges that there are sub-sets of the parameters listed, but the environmental impact of those sub-sets is captured by the benchmarks given in Table 1 and it was felt it was not necessary to get more granular detail and thus will prevent testing fatigue and testing cost.

2. Normative references

The following referenced documents are useful in the understanding of this document and are provided for further guidance. In the case of dispute these references form the core of the evidence in support of the Standard and Benchmarks used here:

Buljan, J. and Král, I. (2019) The framework for sustainable leather manufacture. (2 ed.) United Nations Industry Development Organisation (UNIDO), Vienna, Austria¹.

Buljan, J. and Král, I. (2011) Introduction to treatment of tannery effluents. United Nations Industry Development Organisation (UNIDO), Vienna, Austria.²

¹ <https://leatherpanel.org/content/framework-sustainable-leather-manufacture-second-edition>

² https://leatherpanel.org/sites/default/files/publications-attachments/introduction_to_treatment_of_tannery_effluents.pdf



3. Terms and definitions

Ammoniacal nitrogen (NH₃-N) – ammonia or ammonium ions are a subset of the total nitrogen measured in water outputs to detect levels of the ammoniacal content. Ammoniacal nitrogen is toxic to fish so the levels in (mg/L or ppm) is essential. A low total nitrogen content can still pose problems for fish if the ammoniacal content forms most of the nitrogen content.

COD – Chemical oxygen demand is the mass of oxygen consumed in a chemical reaction that is usually expressed to signify how much oxygen would be demanded from a solution by a pollutant. COD is expressed in mg O₂/L and a higher number signifies a pollutant will demand a lot of oxygen from a water body.

Colour - The term “colour” is used here to mean true colour, that is, the colour of water from which turbidity has been removed. The term “apparent colour” includes not only colour due to substances in solution, but also that due to suspended matter. Apparent colour is determined on the original sample without filtration or centrifugation. The American Dye Manufacturers’ Institute (ADMI) colour determination is a recognised method to measure effluent colour using Adams Nickerson (ANLab) colour difference of the samples compared to a platinum-cobalt colour standard.

ETP – Effluent treatment plant (ETP), a wastewater processing facility that can lower the polluting ability of the outgoing effluent to the benchmark limits, listed in Table 1. The ETP will convert the pollutants into solid sludge/powder (covered by the SLF Standard XX), to atmospheric gas (released to the environment), or biomass.

Facility – the facility being audited against this Standard. If the facility pipes their water outputs to a third parties for treatment, then the benchmarks found in this Standard will be used to judge the final effluent quality of those third parties that is being released to the environment.

Sulfide, S²⁻ - sulfide is an anion formed from the deliberate addition of sulfide salts to a process, or from the reduction (by chemical or microbial activity) of the oxidised forms of sulfur found in effluents.

Total Dissolved Solid – total dissolved solids are the solids determined by gravimetry (drying a known volume of sample out and then weighing) which indicates soluble organic and inorganic chemistry. The salinity of the sample is included in the inorganic soluble fraction.

Total Nitrogen – total nitrogen (TN) includes all forms of nitrogen (N) that are present in the water output (including organic and inorganic sources of nitrogen). The test involves hot digesting the sample in concentrated acid and a catalyst to drive off any carbon and sulfur - leaving ammonium salts. The ammonium salts are converted to ammonia then condensed into an acid trap which is then titrated to determine N quantity.

4. Principle

The effluent parameter tested, must be linked to a Water Output Risk Assessment or a manufacturer restricted substance list (MRSL) that identifies that there is (or is not) a need for water pollution measurement.

The facility effluent parameters (or their contracted third-party facility) are monitored, and the levels obtained will result in the output being classified as A, B, C, or D. The principle of water quality assessment is to measure



the water pollutants that are released by the facility (by mostly fixed-point measurement, e.g., effluent pipe) and to provide the facility with data that helps minimise the contribution that the facility makes to those levels. The due diligence of the facility being audited is to do estimates (through calculations) and confirm them with measurements that show that the facility is not responsible for the pollutant discharge into the environment. It is the requirement of this standard that the facility shows continuous improvement in the water quality of the facility and that a strategy is in place to improve low environmental performance, with pollutant levels falling in C and D bands.

The facility water quality benchmark levels laid out in this Standard appear in four bands A, B, C, and D. The B-Banding correspond (in part) onto the Buljan and Král (2019) and includes an additional three SLF bands, see Table 1. The limit given in the B-band column, see Table 1, is the maximum level that the effluent can have to be awarded a B-band.

A-Banding is a level considered above the levels given in Buljan and Král (2019) that demonstrate outstanding effort (possibly non-detectable levels). A-Banding is automatically awarded to facilities that do not have any processes that generate the parameters listed or whose MRSL and risk assessments can show that the effluent parameter listed is not directly produced by the facility. The limit given in the A-band column, see Table 1, is the maximum level that the effluent can have to be awarded an A-band.

C-Banding shows a level below the levels given in Buljan and Král (2019) which indicates, transparently, that the facility is below the Buljan and Král (2019) levels and that work is underway to improve this. If a stricter level than those given in C-Banding is required by law (then the regulatory limit will supersede the C-Banding limit). The limit given in the C-band column, see Table 1, is the maximum level that the effluent can have to be awarded a C-band.

D-Banding shows that the effluent parameter has not been measured at the time of the audit or is exempt from monitoring.

The frequency of measuring effluent parameters is an important decision, with the optimum laying somewhere between too frequent and not frequent enough.

Minimisation and mitigation to lower/remove pollutants before they can enter the environment and continuous improvement of the effluent parameters from the facility is considered minimum standard practice and the decision-making and monitoring of the facility must demonstrate this practice.

5. Procedure and benchmark

- 5.1 The volume of water leaving the generating facility must be measured.
- 5.2 If using third parties to treat the generating facilities effluent, the levels of pollutants from one facility to the other facility should be measured and known.
- 5.3 Effluent parameters associated with the facility must be identified from Table 1 using the MRSL, the Water Output Risk Assessment, and will be marked off on the report sheet, see Annex A. Exclusions should be fully explained.

Table 1. Water emission benchmarks for facilities (adapted from Buljan and Král, 2019).

Substance	Limit			
pH	5-9			
Temperature	No more than 15°C above the receiving water temperature			
	A	B	C	D
Chemical Oxygen Demand, COD (ppm)	40	300	500	NM
Total Nitrogen, TKN (ppm)	5	50	100	NM
Ammoniacal Nitrogen, NH ₃ -N (ppm)	0.5	30	50	NM
Total Chromium (ppm)	0.05	1.2	2	NM
- Chromium VI (ppm)	0.001	0.01	0.02	NM
Sulfide, S ²⁻ (ppm)	0.1	3	5	NM
Oil and Grease (ppm)	0.5	50	100	NM
Suspended Solids (ppm)	5	50	100	NM
Total Dissolved Solids (ppm)	500	1000	2000	NM
Colour (ADMI)	50	175	300	NM

NM = not measured yet

- 5.4 The number of times the effluent parameters are measured must be decided (recorded in a decision log) and reviewed (yearly).
- 5.5 Effluent parameters must be monitored at least quarterly, and the auditor will need a thorough explanation why the facility frequency of measurement was decided.
- 5.6 The facility will monitor (at the frequency decided in Clause 5.4, 5.5 and 5.6), at the predetermined fixed points - these will be recorded on Annex A.
- 5.7 The levels for each effluent parameter are diagnosed according to the scheme outlined below (and Table 1).
- 5.8 The banding should be recorded on the SLF Standard Water Output Annual Report (given in Annex B).
- 5.9 The facility will monitor and track (including visibly) the annual performance of the effluent treatment plant.
- 5.10 A maintenance plan for the effluent generating facility's ETP or for the third party ETPs for ensuring optimal performance of those plants.
- 5.11 The continuous improvement in lowering effluent parameters will be monitored by annual review and necessary improvements planned for.

6. Calculation of water outputs

- 6.1 Effluent parameters associated with the facility, that are marked off as laid out in Clause 5.3, must be compared, and rated using Table 1.
- 6.2 Effluent parameters that are recorded (at a frequency decided by management) using Annex A and the levels transferred to Annex B to show yearly performance.
- 6.3 A test result that exceeds the maximum level permitted in the C-Banding constitutes an incident and should be recorded, as such, in Annex A.
- 6.4 A report explaining the incidents and their root cause should be generated for each incident, which should be reviewed by management, and decisions needed to prevent future incidents should be logged against each incident.
- 6.5 The Standard expects that the decisions to mitigate incidents should result in progress.



7. Diagnostic parameters

- 7.1 Effluent parameter levels determined by Clause 6, that a facility is required to monitor in whole or in part, in the manner specified by the Principle/Procedure (outlined above), will be published by their banding and measured annual average.
- 7.2
- 7.3 The publication will allow full transparency and focussed environmental objectives that can drive continuous improvement.
- 7.4 Effluent parameters associated with the facility that have been excluded from Annex A must be fully justified.
- 7.5 The number of incidents calculated from Clause 6.3 must be recorded on Annex B for each.
- 7.6 The mitigation decision making outlined in Clause 6.5 should show tangible continuous improvement, specifically that the frequency of incidents is declining, not increasing.

8. Report

The annual test report for Water Output is the latest digital or printed report that shows the effluent parameters calculated (see Clause 6). The report, Annex B, should include:

1. A reference to this Sustainable Leather Foundation Standard (i.e., FSE11.1: 2021)
2. Effluent parameters identified from Table 1, which were identified as relevant for the facility will be marked off on Annex A with justification for any exclusions being recorded in a decision log.
3. The levels of each effluent parameter that has been recorded (using Annex A) and averaged for the whole of the year, see Annex B.
4. The Water outputs and how they compare to the SLF benchmark should appear on the webpage dashboard and the digital device application content.

Annex A

Facility name:

Date:

Relevant? (Tick if Y)	Effluent Parameter	Measured Levels	Incident (Y/N)?
<input type="checkbox"/>	pH		
<input type="checkbox"/>	Temperature		
<input type="checkbox"/>	TKN		
<input type="checkbox"/>	NH3-N		
<input type="checkbox"/>	Total chromium		
<input type="checkbox"/>	- chromium VI		
<input type="checkbox"/>	Sulfide		
<input type="checkbox"/>	Oils and grease		
<input type="checkbox"/>	Total suspended solids		
<input type="checkbox"/>	Total dissolved solids		
<input type="checkbox"/>	Colour		



Annex B – Sustainable Leather Foundation Water Output Annual Report (FSE11.1)

Facility name:

Year:

Relevant? (Tick if Y)	Effluent Parameter	Annual level (Banding)	Number of incidents
<input type="checkbox"/>	pH		
<input type="checkbox"/>	Temperature		
<input type="checkbox"/>	TKN		
<input type="checkbox"/>	NH3-N		
<input type="checkbox"/>	Total chromium		
<input type="checkbox"/>	- chromium VI		
<input type="checkbox"/>	Sulfide		
<input type="checkbox"/>	Oils and grease		
<input type="checkbox"/>	Total suspended solids		
<input type="checkbox"/>	Total dissolved solids		
<input type="checkbox"/>	Colour		
What was the volume of effluent leaving the facility?			
			m³
	Was the treatment of the effluent contracted to a third party?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Were the exclusions of substances in Annex A justified?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Was a decision log (or similar) seen that justifies testing frequency of all water output substances?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Was the effluent parameter testing frequency adequate?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Were incidents fully explained through reports?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Were there any signs, visually, that suggest water treatment did not support the measured values?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Was there a maintenance plan for the ETP that mitigate water outputs?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Was there evidence the ETP was working?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Was there any indication that continuous improvement of water quality was taking place in the facility?	<input type="checkbox"/> YES	<input type="checkbox"/> NO
	Can the SLF element be earned or not?	<input type="checkbox"/> YES	<input type="checkbox"/> NO

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