

Lostock Sustainable Energy Plant Ltd

Lostock Sustainable Energy Plant

H1 Assessment to support Form C6

1 H1 assessment – Process effluent to sewer

During normal operations, process effluents will be re-used within the ash quench process and will not be discharged to sewer. However, during maintenance activities, such as the boiler being drained, or in the event that excess process effluents are generated which cannot be re-used within the process, it is proposed to discharge these to sewer in accordance with a Trade Effluent Consent.

An H1 assessment has been undertaken for the discharge of excess process effluents to sewer from the Facility. The values and substances used in the assessment have been derived from representative data for a comparable Energy from Waste plant. We have applied a conservative assumption that chromium III and IV are released at the monitored concentration value for total chromium.

Sewage treatment reduction factors (STRF) have been applied to the concentrations associated with the release of the effluents in accordance with Appendix B of EA guidance document H1 Annex D. It has been assumed that the process effluent discharged to sewer will be treated in the nearby Northwich Wastewater Treatment Works before being discharged to the River Weaver.

The monitoring data also included for the following substances which have not been included within the H1 assessment as no Environmental Quality Standards (EQS) are available for these substances:

- Chemical Oxygen Demand (COD);
- oils and grease;
- suspended solids; and
- phosphate.

During normal operation, the Facility will not generate process effluents and will be a net consumer of water. Excess process effluents are only likely to be generated (and discharged) during periods of shutdown, maintenance and emptying of the boiler. Therefore, long-term impacts are not considered to be applicable to the proposed arrangements for the discharge of process effluent from the Facility. Nevertheless, the long-term impacts have been included to allow for a conservative assessment.

The assessment assumes continuous discharge of process effluent from the Facility at the maximum allowable flow rate. This results in a highly conservative assessment, as process effluents will not be discharged continuously from the Facility and are more likely to be discharged in 'batches' as required.

1.1 Test 1

Test 1 of the assessment determines whether the concentration of the substance in the discharge exceeds 10% of the EQS. The test is designed to quickly screen out substances that cannot cause more than 10 percent deterioration in the watercourse, even if it receives no dilution.

The results of Test 1 of the H1 assessment (for discharges to rivers) are presented in Table 1.

Table 1: H1 assessment results - Test 1

Substance	Annual average EQS			Short-term (MAC) EQS		
	Release concentration (µg/l)	EQS (µg/l)	Release <100% EQS?	Release concentration (µg/l)	MAC (µg/l)	Release <100% EQS?
Ammonia	3,210	200	Fail	3,210	-	N/A
Chromium III	4.2	4.7	Fail	4.2	32	Fail
Chromium VI	4.2	3.4	Fail	4.2	-	N/A
Copper	5.4	1	Fail	5.4	-	N/A
Cyanide	6.4	1	Fail	6.4	5	Fail
Iron	1,400	1,000	Fail	1,400	-	N/A
Nickel	11.9	4	Fail	11.9	34	Fail
Silver	0.8	0.05	Fail	0.8	0.1	Fail
Sulphate	34,800	400000	Pass	34,800	-	N/A
Zinc	24.7	10.9	Fail	24.7	-	N/A

Note: Concentrations include STRF

As can be seen from the results above, all pollutants fail Test 1 with the exception of sulphate. Therefore, these pollutants have been carried over onto the next stage of assessment.

1.2 Test 2

Test 2 determines whether the process contribution (PC) exceeds 4% of the EQS and takes into account the dilution available in the receiving watercourse. PC is the concentration of a discharged substance in the receiving water after dilution.

The PC is calculated as follows:

$$PC = \frac{(EFR \times RC)}{(ERF + RFR)}$$

where:

- PC = Process Contribution (µg/l);
- EFR = Effluent Flow Rate (m3/s);
- RC = Release Concentration of the pollutant in the effluent (µg/l); and
- RFR = Q95 River Flow Rate (m3/s).

Data on river flow rates was obtained from the National River Flow Archive (NRFA) for the Weaver at Ashbrook monitoring station.

The results of Test 2 of the H1 assessment are presented in Table 2.

Table 2: H1 assessment results – Test 2

Substance	Annual average EQS				Short-term (MAC) EQS			
	EQS (µg/l)	PC (µg/l)	% PC of EQS	<4%?	MAC (µg/l)	PC (µg/l)	% PC of MAC	<4%?
Ammonia	200	3.57	1.79	Pass	-	-	-	N/A
Chromium III	4.7	0.0047	0.10	Pass	32	0.0047	0.015	Pass
Chromium VI	3.4	0.0047	0.14	Pass	-	-	-	N/A
Copper	1	0.0060	0.60	Pass	-	-	-	N/A
Cyanide	1	0.0071	0.71	Pass	5	0.0071	0.14	Pass
Iron	1,000	1.56	0.16	Pass	-	-	-	N/A
Nickel	4	0.013	0.33	Pass	34	0.013	0.039	Pass
Silver	0.05	0.00090	1.78	Pass	0.1	0.00090	0.89	Pass
Zinc	10.9	0.028	0.25	Pass	-	-	-	N/A

As can be seen the results above, for all pollutants the PC is less than 4% of the EQS/MAC, and the substances can be screened out as insignificant in accordance with the H1 guidance.