Environmental Screening Statement – Chemical Dosing within WTS20 Treatment System

1. Introduction

This screening statement assesses the potential environmental impact associated with the use of coagulant, flocculant and pH correction chemicals within the WTS20 treatment system prior to discharge to Talacre Brook.

The chemicals proposed for use are:

- Ferric Chloride Solution (40%) – coagulant
- BRENNTAMER L120 polymer – flocculant
- Caustic Solution (30% Sodium Hydroxide) – pH correction

All substances are widely used in industrial and municipal water treatment applications.

2. Treatment Process Context

The proposed system comprises:

- Controlled chemical dosing
- Flocculation chamber
- Settlement tank
- Two-stage GAC treatment (lead–lag configuration)

Coagulant and flocculant are injected upstream of settlement, with pH adjustment controlled via in-line monitoring.

The process is designed so that:

- Coagulant binds suspended solids
- Polymer aids floc formation
- Solids are removed via settlement
- Clarified water passes through dual GAC vessels prior to discharge

This multi-barrier treatment system provides solids removal and adsorption polishing prior to discharge.

3. Hazard and Ecotoxicity Screening

3.1 Ferric Chloride (40%)

Ferric chloride is classified as corrosive and may present aquatic toxicity at elevated concentrations.

Within the treatment process:

- Dosing is flow-paced and controlled
- Ferric chloride rapidly hydrolyses in water
- Iron precipitates as ferric hydroxide and is removed in the settlement stage
- The majority of iron is removed with settled solids

No free ferric chloride is expected to remain in the final effluent.

3.2 Polymer (BRENNTAMER L120)

The selected polymer is not classified as dangerous under GB CLP regulations and does not meet criteria for PBT or vPvB substances.

Polymer dosing rates in flocculation systems are typically low (mg/L range). The polymer binds to suspended solids and is removed with sludge during settlement.

Residual concentrations in clarified effluent are expected to be negligible and significantly below ecotoxicological concern thresholds.

3.3 Caustic Soda (30% Sodium Hydroxide)

Sodium hydroxide is corrosive and may affect aquatic organisms through pH shift at elevated concentrations.

Within the treatment system:

- Dosing is automated and controlled via inline pH monitoring
- Effluent discharge pH will be maintained within permit compliance limits

- No free caustic is discharged

Environmental risk is therefore controlled through pH management and compliance monitoring.

4. Predicted Environmental Risk at Discharge

Based on:

- Controlled and flow-paced dosing
- Removal of coagulated solids via settlement
- Final polishing through dual GAC vessels
- Continuous pH monitoring
- Routine effluent sampling

Residual concentrations of treatment chemicals at the final discharge point are expected to be negligible and below ecotoxicological concern thresholds.

The system represents standard and widely accepted water treatment practice for suspended solids and contaminant removal prior to discharge.

There is no anticipated adverse impact on:

- Talacre Brook ecological receptors
- Water Framework Directive status
- Downstream water quality objectives

5. Conclusion

The proposed use of ferric chloride, polymer and caustic soda within the WTS20 system has been screened against available hazard and ecotoxicity data.

Given:

- Low dosing rates
- Removal of bound material via settlement
- Final polishing through dual GAC vessels
- Controlled effluent pH
- Defined monitoring regime

Residual concentrations at discharge are not expected to present an environmental risk. This treatment configuration aligns with established industrial water treatment practice and does not materially alter the environmental risk profile of the permitted discharge.