

Appendix 14C.6

Comparison of Toxic Gas Impact Distance

1. This appendix presents the comparison of toxic gas impact distance calculated by SAFETI *micro* with the assessment results of a previous hazard assessment study for local water treatment works.

Comparison of Toxic Gas Dispersion Distance modelled by SAFETI *micro* with Previous Hazard Assessment Study

2. In order to compare the hazard distance calculated by SAFETI *micro* with the assessment results in previous chlorine hazard assessment study for Au Tau Water Treatment Works¹, the event of 10-minute chlorine release in a rate of 1.4kg/s with 2D and 2F weather class was modelled by SAFETI *micro*. **Table 1** presents the comparison of modelling results.

Table 1 Distance to Locations Receiving Fatality Probability

Study	Weather Class	Distance to Location receiving Fatality Probability of		
		90%	50%	3%
Au Tau WTW Study (1.4kg/s release)	2D	135m	165m	265m
	2F	130m	180m	330m
Current Study (1.4kg/s release) – modelled by SAFETI <i>micro</i>	2D	120m	170m	300m
	2F	200m	400m	880m

3. From the above results, it can be observed that the modelling results of the Au Tau Water Treatment Works (WTW) hazard assessment study (using Computational Fluid Dynamics modelling) and the modelling results by SAFETI *micro* are comparable under weather class 2D. For weather class 2F, the modelling results of SAFETI *micro* were found to be more conservative than the Au Tau WTW risk assessment study.

¹ ERM (2001). Reassessment of Chlorine Hazard for Eight Existing Water Treatment Works – Au Tau Water Treatment Works.