EXECUTIVE SUMMARY

Benzyl Alcohol – Oral Risk Assessment CAS # 100-51-6			
PARAMETER	**LEVEL**	**UNITS**	**CALCULATED:**
NOAEL (no-observed-adverse-effect level)	143	mg/kg-day	From a 2-year bioassay in mice.
Oral RfD (oral reference dose)	0.5	mg/kg-day	From a 2-year bioassay in mice.
TAC (total allowable concentration)	3	mg/L	For a 70 kg adult drinking 2 L/day, with a 20% source contribution for water
SPAC (single product allowable concentration)	0.3	mg/L	Based on 10 sources of benzyl alcohol in drinking water
STEL (short term exposure level)	10	mg/L	For a 10 kg child drinking 1 L/day

KEY STUDY	NTP. 1989. National Toxicology Program Toxicology and Carcinogenesis Studies of Benzyl Alcohol (CAS No. 100-51-6) in F344/N Rats and B6C3F1 Mice (Gavage Studies). NTP Technical Report 343. National Institutes of Health Publication No. 89-2599.
CRITICAL EFFECT	The chronic study did not identify any statistically significant toxic responses to benzyl alcohol administration in either rats or mice to serve as the critical effect. At higher dose levels than were used in the chronic study, lethargy and progressively more severe neurotoxic responses with increasing dose were observed.
UNCERTAINTY FACTORS	• 10x for interspecies extrapolation, as there are insufficient data to establish a data-derived uncertainty factor • 10x for intraspecies extrapolation, as there are insufficient data to establish a data-derived uncertainty factor • 1x for duration of exposure, as a lifetime exposure study was used as the key study • 1x for LOAEL to NOAEL extrapolation, as a NOAEL was used • 3x for database deficiencies, as there are no two-generation reproduction or standard developmental toxicity studies The total uncertainty factor is, therefore, 300x.
TOXICITY SUMMARY	Studies in rats and mice dosed by gavage with benzyl alcohol at levels up to 2,000 mg/kg-day resulted in progressive lethargy, sedation, and death. No associated histopathology was seen in these animals. There was no evidence of any cumulative toxic effect of benzyl alcohol exposure based on studies in rats and mice of 16 days to 2 years duration. Benzyl alcohol was not mutagenic in standard *in vitro* tests, and there was no evidence of cancer in rats or in mice after two years of exposure. Benzyl alcohol is rapidly absorbed and metabolized to benzoic acid in humans. With the exception of rare, mild sensitization reactions, a 4.5 mg/kg-day intravenous dose appears to be without adverse effect in adults. Medical use of benzyl alcohol as a preservative in flushing solutions for intravascular catheters and injectable medications resulted in metabolic acidosis, gasping respiration, and some deaths in low birth weight newborns. The problem was recognized and the use of benzyl alcohol as a preservative was severely limited in fluids used for these patients.
CONCLUSIONS	Benzyl alcohol is a relatively nontoxic compound in adults and children. Care must be taken not to give newborns, especially those of birth weight ≤ 2,500 g, an inadvertent parenteral dose that exceeds their immature metabolizing capabilities. The TAC, SPAC, and STEL levels for oral benzyl alcohol exposure derived in this assessment are considered protective of human health.