

**REFINED EXPOSURE ASSESSMENT FOR INGESTION OF
TAPWATER CONTAMINATED WITH HEXAVALENT CHROMIUM:
CONSIDERATION OF EXOGENOUS AND ENDOGENOUS
REDUCING AGENTS**

**BRENT D. KERGER,* RICHARD O. RICHTER,* STEPHANIE M. CHUTE,*
DAVID G. DODGE,* SUSAN K. OVERMAN,* JAMES LIANG,† BRENT L. FINLEY,‡
AND DENNIS J. PAUSTENBACH‡**

*McLaren/Hart-ChemRisk
Irvine, California

†MBT Environmental Laboratories
Rancho Cordova, California

‡McLaren/Hart-ChemRisk
Alameda, California

Laboratory studies were conducted to determine how rapidly and completely chromium (VI) [Cr(VI)] is reduced upon contact with common beverages mixed with tapwater. Studies were performed for five common beverages (coffee, tea, orange juice, Kool Aid®, and powdered lemonade) spiked with either 10 or 50 mg Cr(VI)/l. The concentrations of Cr(VI) were measured at several time intervals for up to four hours. It was demonstrated that each of these beverages had the capacity to reduce a concentration of ≥ 8 mg Cr(VI)/l within a 15-minute time frame, and that continued monitoring of the beverages revealed greater reduction of the Cr(VI). These findings are consistent with the observation that many foods and beverages, as well as endogenous body fluids such as saliva and gastric juices, are capable of reducing substantial quantities of Cr(VI) to Cr(III). Our exposure assessment shows that the estimated high-end ingested dose of Cr(VI) from tapwater at both 1 and 5 mg Cr(VI)/l is generally two to three orders of magnitude below doses shown to have no adverse health effect in