

## GRADIENT HEALTH RISK ASSESSMENT SUMMARY

[The following is an excerpt from “Corrales Environmental Health Evaluation Community Process summary Report,” prepared by the New Mexico environment Department, June, 2004, pp. 18-19. Available at <http://www.nmenv.state.nm.us/aqb/projects/Corrales/index.html> ]

The Gradient Health Risk Assessment (HRA) used all of the numeric modeling and monitoring data provided by NMED (Table 1 of this document, sets 5-9) to evaluate chronic and acute health risks. The HRA followed EPA guidelines in selection of screening values.

Gradient evaluated seven acute risk scenarios, summarized in Gradient Table 5.8. In each case, Gradient used the maximum 1-hour and/or 24-hour average that was recorded to calculate a hazard quotient (HQ) for that substance. No individual compounds created a HQ greater than one. Generally, if exposures for a given chemical are at or below the acute inhalation exposure level (i.e., HQ less than one), then that chemical is not considered to pose a significant risk of adverse health effects. This means that short-term air concentrations representative of worst-case exposures do not exceed acute inhalation exposure criteria.

To estimate the risks of acute health effects due to combined sub-threshold exposures to multiple chemicals, the HQ for individual chemicals was added to obtain an overall acute hazard index representing the combined exposure. USEPA recommends this additive approach as a conservative technique for addressing the potential consequences of simultaneous exposure to multiple chemicals because data are not currently available to determine if interactive effects (i.e., synergism, antagonism) occur from the combined exposure to the chemicals of concern. Although USEPA specifies that only hazard quotients for chemicals that act on a similar target organ or system be added together, all hazard quotients were conservatively added. This is a health-protective approach, where the summed hazard index likely overestimates potential health impacts since it sums hazard quotients for different chemicals that are based on maximum concentrations that occurred at different times and different places. For the evaluated acute risk scenarios, only one summed hazard index exceeded unity. A summed hazard index of 1.7 was obtained for the acute risk scenario using maximum 1-hour average concentrations obtained from the TRC OP-FTIR monitoring event where the monitor was located in the NW corner of the Intel campus with a southerly sample path.

Gradient assessed the chronic health affects using modeling estimates only for annual average concentrations. Approved chronic toxicity factors were not available for 17 of the 27 modeled compounds, so the report appears to indicate that only 10 were analyzed. Gradient subsequently calculated the chronic risk for all 27 compounds, using Texas Effects Screening Levels (ESLs) where other screening values were not available. The chronic HI with this methodology remains less than one (0.047).

NMED followed the Gradient protocol to look at chronic risk using the 41 chemicals

analyzed in Rio Rancho and Bernalillo during the 1-year Urban Toxic study. From 46 samples, the highest 24-hour concentration for each compound was presumed to continue for a full year. No individual compound exceeded a health quotient of one. The combined synergistic hazard index was 0.46 at Rio Rancho and 2.35 at Bernalillo.

The health risk assessment is limited by the small amount of fixed monitoring site data used to represent potential personal exposures; data are not available to describe the short-term exposures of each individual even during the limited monitoring events, let alone other time periods.

In conclusion, this risk assessment did not find evidence that any of the measured or modeled chemicals are associated with increased acute or chronic health risks. Gradient qualified this conclusion, however, by pointing out that there are uncertainties associated with the available monitoring and modeling data.