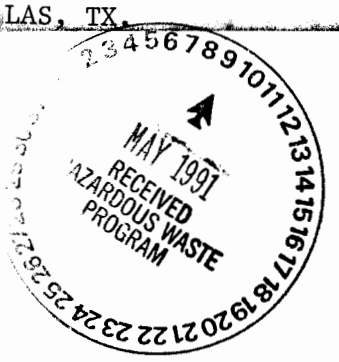
U.S. EPA - REGION 6 LAS, TX.

1445 ROSS AVENUE

MAY 3 1991



Colonel Ira Hester, USAF
Commander
833rd Combat Support Group
Holloman Air Force Base, New Mexico 88330

Re: TOC in wells downgradient of the sewage treatment lagoons

Dear Colonel Hester:

During our January 31, 1991, meeting, EPA provided evidence to Holloman Air Force Base (HAFB) of a statistically significant increase in Total Organic Carbon (TOC) in monitoring wells downgradient of the sewage treatment lagoons. Representatives of HAFB requested that EPA document this determination, and discuss their reasons for rejecting the first round of TOC data.

Organic carbon in ground water occurs dominantly as dissolved organic carbon (DOC), and ranges in concentration from 0.2 to 15 mg/L with a median concentration of 0.7 mg/L (Thurman, 1985a). The majority of all ground water has less than 2 mg/L DOC (Barcelona, 1984). In semi-tropical regions where organic-rich surface waters recharge ground waters, and in coal-rich regions, DOC may be as high as 5-15 mg/L (Thurman, 1985b; Feder and Lee, 1981).

Total organic carbon (TOC) is equal to the sum of DOC and particulate organic matter (POC). Values for TOC in excess of natural levels of DOC therefore reflect excessive POC.

The first monthly ground water sampling report had levels of TOC greatly in excess of natural DOC for monitoring wells 1, 2, 3, 4, 5, 7, and 8. Reported values ranged from 19 to 51 mg/L TOC. For the same samples, turbidity varied between 18 and 112 NTU, whereas maximum acceptable turbidity is 5 NTU.

EPA's CME team obtained split samples for monitoring wells 1, 5, and 7 during the first monthly event. The results for TOC were <1, 4, and 3 mg/L, respectively. These values correspond closely to results from subsequent sampling events, and are geochemically reasonable. In contrast, Holloman reported 19, 31, and 28 mg/L,

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Bruce Swanton, NMED

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Therefore, EPA has concluded that Holloman's first monthly results for TOC cannot be used to compute background. EPA rejects all the TOC data for that event, as it is not possible to differentiate between "possibly good" data and bad data. In place of the value for upgradient well MW-1, Holloman may substitute EPA's result (enclosed). Holloman may alternately use the second, third, and fourth monthly events, and the first semi-annual event to compute background for MW-1. Background should then be compared with results from downgradient wells from the first semi-annual event.

According to our statistical analysis, there is a significant increase in TOC between upgradient well MW-1 and downgradient wells. Therefore, Holloman shall submit a groundwater quality assessment plan within fifteen days of receipt of this letter, as specified in the compliance agreement.

Finally, examination of the potentiometric data provided by HAFB indicates that well S-2 is not exclusively upgradient of the lagoon system. This well cannot be used as an upgradient well for statistical comparisons. HAFB should note this fact in the appropriate ground water monitoring document and act accordingly in all statistical evaluations.

References: Barcelona, M.J., 1984, Groundwater, v.22, pp.18-24.
Feder, G.L. and Lee, R.W., 1981, USGS Open-File Report, 81-696.
Thurman, E.M., 1985a, Organic Geochemistry of Natural Waters. Boston: M.N. Publishers.
Thurman, E.M., 1985b, in Aiken et al. (eds), Humic Substances. New York: John Wiley and Sons.

If you have any questions, please have your staff contact Dr. Ellen Graber of my staff at (214) 655-6790.

Sincerely yours,

Allyn M. Davis
Director
Hazardous Waste Management Division (6H)

Enclosure