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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: A Toxicological Evaluation of the 5-15-87 Laboratory Report Concerning Volatiles in Homewells near the Cry Site

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In order to establish the criteria by which the hazards presented by these contaminants are measured it is important to consider that this water has probably been contaminated for many years. Although a variety of criteria for drinking water exist (health advisories, drinking water exposure levels, maximum contaminant levels, unit risk levels, potency indices, referenced doses, and others), none actually cover this particular situation. To further confuse this situation, many of these criteria assume that the only exposure to these volatile substances is from the consumption of contaminated water. Recent investigations have revealed that far more impact is elicited from the incidental contamination of household atmospheres from domestic water contaminants during showering, clothes laundering, dishwasher operations, and other domestic functions that utilize the household water.

Many of the volatile contaminants reported in the domestic wells are probable human carcinogens and are at levels higher than 10^{-6} level limits recommended by the Agency but are lower than health advisories concerning non-concinogenic health effects. Other volatiles are currently not considered to be carcinogens by the Agency and are present at levels below short-term health advisories, but higher than longer-term health advisory levels.

THE STRAUBE HOMEWELL

The Straube homewell contains a level of 1,1-dichloroethene (1,1-DCE) that is lower than any health advisory, but this substance is a Group C carcinogen (limited evidence of carcinogenicity in animals) and elicits a 3.5 E-02 lifetime cancer risk according to current Agency criteria.

The level of 1,1,1-trichloroethane (1,1,1-TCA) in this well is almost identical to the lifetime health advisory concerning non-carcinogenic impacts) that estimates a 20 o/o exposure from drinking water (200 ug/1). This substance is not currently considered to be a probable or suspectent human or animal carcinogen by the Agency.

Individually, the concentrations of trichloroethene and tetrachloroethene are calculated to cause a 3.1 E-07 and 5.8 E-07 cancer risk respectively. These substances are class B2 carcinogens indicating that they are probable human carcinogens and when these risks are added they approximate the risk limit recommended by the Agency.

The foregoing information indicates that it is inadvisable to consume this water for an extended interval of time. Take note that the calculations and risks presented have not considered total household exposures to thes volatile substances, but only threats from drinking water impacts. Actual impacts are likely to be many times those given above.

Hoffman/Heimback Homewell

The contaminant of significant concern in this well is the 9 ug/l of trichloroethene (TCE). This level of TCE presents a drinking water threat of 2.8 E-06. Again it is important to remember that this substance will contaminate the household atmosphere and that this contaminant has probably been in this water for several years.

The Di Cindio Homewell

Total impacts from suspected and probable human carcinogens are calculated to provoke a lifetime concer risk of approximately 7.5 E-04. These substances include 1,1-DCE, TCE, and PCE.

The level of 1,1,1 - TAC approximates the adjusted health advisory criteria of 200 ug/1.

This water is not safe to drink over an extended interval of months or years as it constitutes both an unacceptable carcinogenic and non-carcinogenic health risk. Only drinking water impacts were calculated.

The Greenley Homewell

Contaminants in this well are calculated to invoke a carcinogenic risk of approximately 1.5 E-03. This figure includes the risks from 1,1 -DCE, TCE and PCE which are suspected (1,1-DCE) and probable (TCE and PCE) human carcinogens. These risk calculations were limited to the impact from drinking water only and do not include the atmospheric impacts previously described.

Non-carcinogenic toxic health effects appear to be possible from the level of 1,1,1 - TCA (366 ug/l) reported in this well water. This level exceeds the adjusted long-term health advisory of 200 ug/l.

The Garber Sr. Homewell

Total carcinogenic risk impacts from drinking this water are calculated to be about 8.1 E-05 for 1,1-DCE, TCE, and PCE.

Non-carcinogenic toxic impacts are calculated to be far below any Agency criteria in this regard.

The carcinogenic threat from the consumption of this water exceeds Agency criteria for public water supplies.

The Reigner Homewell

The only contaminant in this water that warrants concern is the 0.30 ug/l of 1,1-DCE which is calculated to provoke about a 5.0 E-06 risk from the consumption alone. As previously stated, this substance, as any volatile substance, is likely to contaminate the breathing spaces of this residence and enhance the risk of contracting cancer.

Conclusion

It is noted that several of these wells are presently utilizing some type of treatment. None of the water assessed in this report should be used over an extended time interval without an effective system that treats all waters used indoors. Considering that the consumers of these waters appear to have been consuming these contaminants for a number of years it is strongly recommended that a treatment regimen be instituted without undue delay on waters not already treated.