MICHIGAN DEPARTMENT OF NATURAL RESOURCES 0 0 0 0 0 3 5

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INTEROFFICE COMMUNICATION

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Chris

SUBJECT: Comments on RSSC's Evaluation of Proposed Plan and Recommended Modifications for the Rasmussen Site

I have reviewed the Rasmussen Site Steering Committee's (RSSC) Evaluation of the Proposed Plan and Recommended Modifications for the Rasmussen site. My comments pertain to Section 3.0 entitled Groundwater Remedy Comments. I will refer my comments to the subsections as presented in RSSC's document.

3.3.1. Calculation of Cleanup Criteria

3.3.1.1. Acetone, 2-butanone, 1,2-dichloroethene, ethylbenzene, 4-methyl-2-pentanone, toluene, 1,1,1-trichloroethane and xylenes.

Based on the May/June, 1990 and October, 1990 sampling conducted by the committee, RSSC wants to delete the following chemicals from the list of indicator chemicals because they were detected at concentrations below Type B Cleanup Criteria: acetone, 2-butanone, 1,2-dichloroethene, 4-methyl-2-pentanone and 1,1,1-trichloroethane. They propose deleting 2-butanone because it was not detected during either sampling trip.

In the proposed plan, the highest concentration in which 2-butanone was detected in groundwater is 74,000 ppb. The fact that this chemical has been detected in valid samples during previous sampling trips at concentrations exceeding the Type B criterion indicates that it should not be eliminated from the list of indicator chemicals.

The maximum concentrations reported in the proposed plan for the remaining chemicals addressed in this section exceed Type B Criteria. RSSC did not present any argument as to why the data as presented in the proposed plan should be ignored or eliminated. If Type B Criteria are exceeded anywhere on site at any time, those chemicals should be included in the indicator chemical list unless they can be shown to be lab or field contaminants or the data are determined to be invalid. I recommend that these chemicals remain on the list of indicator chemicals.

3.3.1.2. Benzyl alcohol

The Type B Criterion for benzyl alcohol was incorrectly reported as 9 ppb. The correct Type B cleanup number is 10 ppm (10,000 ppb) based on data from a National Toxicology Program bioassay (1989). Due to the fact that the reported concentrations of benzyl alcohol do not exceed the Type B Criterion, it should be removed from the list of indicator chemicals.

3.3.1.3. Bis(2-ethylhexyl)phthalate
Although the risk associated with the maximum concentration of bis(2-ethylhexyl)phthalate (DEHP) is within the EPA's acceptable range, it exceeds MDNR's acceptable risk limit of 1E-6. Although DEHP is a common laboratory contaminant, EPA and MDNR recommend eliminating common laboratory contaminants only if the concentrations in the sample do not exceed ten times the maximum amount detected in any blank. If this can be demonstrated, DEHP could be deleted from the list of indicator chemicals. Until then, it should remain on the list.

3.3.1.4. Chlorobenzene
The data from the paper by Amoore and Hautala (1983) was chosen to establish aesthetics criteria because it is a good quality study. The threshold odor concentration (T.O.C.) of 100 ppb reported in Verschueren (1983) is based on two German articles that are not available for review. EPA itself has relied on Amoore and Hautala (1983) for establishing Secondary Maximum Contaminant Levels. The cleanup level for chlorobenzene remains 50 ppb.

3.3.1.5. 2-Chlorophenol
2-Chlorophenol should only be deleted if it's detection in previous samples can be refuted. Please refer to previous discussion pertaining to 2-butanone.

The selection of 0.1 ppb as the aesthetics criterion is based on the data in Verschueren. These data are reported as an odor threshold of 0.18 ppb and a taste threshold ranging from 0.1 to 6.0 ppb. Since the odor threshold is reported at 0.18 ppb, a concentration of 0.1 ppb should protect against both adverse taste and odor effects. An acceptable method detection limit (MDL) for 2-chlorophenol is 5 ppb. Since the aesthetics criterion is less than the MDL, the MDL becomes the cleanup goal. The cleanup level for 2-chlorophenol should be reported as 5 ppb. The final Type B criterion for 2-chlorophenol is 5 ppb. However, since the aesthetics criterion is significantly less than the MDL, an attempt to evaluate the aesthetics of the remediated groundwater should be made.

3.3.1.6. 1,1-Dichloroethene
According to the Proposed Plan, 1,1-dichloroethene (1,1-DCE) has been detected in groundwater at a maximum concentration of 590 ppb. It can only be deleted from the list of indicator chemicals if this data can be refuted. Please see previous discussion.

MDNR is currently reviewing the carcinogenicity data for 1,1-DCE to determine if it should be regulated as a carcinogen. Since the Department has historically regulated 1,1-DCE as a carcinogen, we will continue to do so until the toxicological review is completed. The Type B criterion for 1,1-DCE remains 1.0 ppb.

3.3.1.7. 2,4-Dimethylphenol
MDNR has recently updated their Type B criterion for 2,4-dimethylphenol.

An oral RfD became available in IRIS as of 11/1/90. The associated Type B groundwater criterion is 100 ppb. Since the health-based value is lower than the aesthetics criteria of 400-500 ppb, 100 ppb is the final Type B cleanup number. This chemical can be deleted from the list of indicator chemicals, because the maximum concentration detected at the Rasmussen site is 27 ppb.

3.3.1.8. Isophorone

Isophorone was detected in groundwater at a maximum concentration of 440 ppb. Isophorone cannot be eliminated from the list of indicator chemicals unless these data can be refuted. (Please see previous discussion). This concentration is associated with a level of carcinogenic risk which is unacceptable to MDNR.

3.3.1.9. 2-Methylphenol and 4-Methylphenol

The aesthetics data for 2-methylphenol and 4-methylphenol have been reevaluated. Verschueren (1983) reports the following aesthetics data for 2-methylphenol in water:

odor threshold (tentative):		average:	0.65 mg/l	
		range:	0.016-4.1 mg/l	(294)(97)
T.O.C. in water:	0.09 ppm			
	0.65 ppm			(326)
T.O.C. in water:	0.26 ppm			(325)
Odor threshold:	detection:	1.4 mg/l		(998)
Taste threshold conc.:		0.003 mg/l		(998)

Reference 998 is a German article unavailable for review. Our original decision to use this article for development of the aesthetics criterion was inappropriate. We are currently using reference 325 entitled "Odor thresholds of mixed organic chemicals" by A. A. Rosen et al. (1962) to develop the criterion. The threshold value developed by Baker (Ref. 294) is a tentative value and the data reported by Stahl (Ref. 326) is a compilation of data and includes the data of Baker. The study by Rosen (1962) is a well-conducted study. Threshold odor concentrations for several compounds were generated using a panel of 11 to 16 judges taken from the same pool of 20 people. The geometric mean is reported as the threshold odor concentration (T.O.C.). The Type B criterion for 2-methylphenol is ~~400 ppb~~ 300 GC.

The only data reported for 4-methylphenol is a taste threshold concentration of 0.002 mg/l and a odor theshold (detection) of 0.2 mg/l from the previously mentioned German article. Since inadequate aesthetics data exists for this chemical, we will rely on the HLSC as the Type B criterion. However, since adverse aesthetics are associated with the phenolic compounds, an attempt to evaluate the aesthetics of 400 ppb 4-methylphenol is recommended. Since the maximum reported concentration of 4-methylphenol is 280 ppb, it can be deleted from the list of indicator chemicals.

As a summary, the Type B criterion for 2-methylphenol is 300 ppb (260 rounded to 1 significant figure) and 4-methylphenol should be removed from the list of indicator chemicals.

3.3.1.10. Methylene chloride
In evaluating sample data for common laboratory contaminants, EPA recommends including them as site contaminants only if the sample concentrations exceed 10 times the concentrations detected in the lab blanks. If this criterion is not met for any of the groundwater data, methylene chloride can be deleted as an indicator chemical. Until this can be demonstrated, methylene chloride should remain on the list.

3.3.1.11. Benzene and Vinyl Chloride
This section refutes Type B criteria for benzene and vinyl chloride in favor of Type C criteria based on technical limitations imposed by analytical chemistry, remedial technologies and cost effectiveness. George Jackson has recently published final method detection limits (MDL) which includes a MDL of 1.0 ppb for vinyl chloride; the previously reported MDL is 0.5 ppb. An acceptable detection limit of 0.18 ppb was reported in the Proposed Plan. The various detection limits and the confusion surrounding this issue warrant a final policy decision on this matter by management. Further comments on this section should be made by staff with expertise in analytical chemistry and remediation technology.

3.3.1.12. Tetrachloroethylene
The maximum concentration of tetrachloroethylene was incorrectly reported as 2.0 ppb in the proposed plan. The concentrations detected do not exceed the Type B criterion, so tetrachloroethylene should be deleted from the list of indicator chemicals.

3.3.1.13. Trichloroethylene
MDNR does not accept the general application of Drinking Water Standards for carcinogens as standards for groundwater cleanup. We believe it is inappropriate to use standards established for municipal water systems when generating cleanup criteria. The development of drinking water standards incorporates factors that are not applicable to remediation of environmentally contaminated sites. For example, MCLs are based on available treatment technology which is feasible for application to municipal water supplies. The feasibility of treatment for groundwater cleanups may be different, and the economics of that treatment are very different from the economics of treatment for a public water supply. MCLs are also based on practical limits of laboratory technology required to monitor thousands of water supplies across the country. Limits of analytical technology for analyses to measure the effectiveness of a groundwater cleanup are different and can be significantly lower. This allows for control of contaminants at levels that present significantly less risk to the public health. In addition, the analysis of risk associated with MCLs must take into account certain public health concerns which are not relevant in the context of groundwater cleanup.

For example, the risks associated with the chemical by-products of chlorination must be balanced by the benefits that chlorination brings to society by reducing the number of disease-causing bacteria. The Type B criterion of 3 ppb for trichloroethylene is associated with an increased cancer risk of 1E-6 which the Department considers an acceptable level of risk and which serves as our basis for regulating carcinogens. The Type B groundwater criterion for trichloroethylene remains 3 ppb.

3.3.1.14. Lead

Attached is further rationale for developing a Type B criterion of 5 ppb for lead. The basis for this criterion is not specifically inhalation exposure, but rather a blood lead level produced by a variety of exposures. The Accepted Daily Intake (ADI) developed several years ago by EPA is out of date and inappropriate to use. EPA states in IRIS: "By comparison to most other environmental toxicants, the degree of uncertainty about the health effects of lead is quite low. It appears that some of these effects, particularly changes in the levels of certain blood enzymes and in aspects of children's neurobehavioral development, may occur at blood lead levels so low as to be essentially without a threshold." Since development of the ADI, lead has also been classified as a probable human carcinogen. As a result, I think it is appropriate to use an approach that takes these factors into account and yields a more conservative estimate than the ADI developed several years ago.

3.3.1.15. Cadmium

Analysis of inorganics in groundwater is currently recommended to be conducted using analysis for dissolved metals. RSSC is recommending deleting cadmium from the list of indicator chemicals based on their recently analysis for both dissolved and total metals. I recommend maintaining cadmium as an indicator chemical until it can be clearly demonstrated that all concentrations of dissolved cadmium on site do not exceed the HLSC of 4 ppb.

In conclusion, a summary of my comments on Section 3.3.1 follows. I concur with RSSC on the elimination of four chemicals from the list of indicator chemicals: benzyl alcohol, 2,4-dimethylphenol, 4-methylphenol and tetrachloroethylene. If demonstrated to be laboratory contaminants, bis(2-ethylhexyl)phthalate and methylene chloride may also be deleted. However, in my opinion, adequate justification has not been provided for the removal of any additional chemicals from the list of indicator chemicals.

Contact me at 30160 if I can provide any additional information.

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