



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
JACKSON DISTRICT OFFICE



STEVEN E. CHESTER
DIRECTOR

March 2, 2004

VIA E-MAIL & US MAIL

Mr. Farsad Fotouhi
Environmental Manager
Pall Life Sciences, Inc.
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Mr. Michael L. Caldwell
Fink, Zausmer & Kaufman
31700 Middlebelt Road,
Suite 150
Farmington Hills, MI 48334

Dear Sirs:

SUBJECT: Gelman Sciences, Inc. (GSI) Remedial Action
Work Plan for Testing of *In-Situ* Oxidation dated February 17, 2004

We have reviewed the above referenced submittal, which was submitted to replace an earlier version of the work plan, dated December 22, 2003. Some revisions to the proposed work plan are required.

We have discussed the possible use of roto sonic drilling and intensive gamma logging. If possible, we would like two of the borings to be done using roto sonic drilling. These borings should also be gamma logged. If equipment is readily available which will fit into a one-inch diameter well, we would like the six deepest observation wells (OW) to be gamma logged. While neither of these requests is required to implement or analyze the proposed work plan, we do believe it would provide information useful for guiding future decisions. Alternatively, if it is not feasible to implement these requests at this time, the injection well should be gamma logged, at a minimum. If roto sonic drilling is not used, we will be requesting this drilling method to be used in a few of the future borings.

A representative sample of the aquifer material should be collected during drilling to determine the natural oxidant demand (NOD), compared to the predicted NOD, to better address the feasibility of long-term application of this technology at this facility.

The water that will be used in the hydrogen peroxide solution should be analyzed for the major cations and anions listed in Table 1, alkalinity and specific conductance.

It is our understanding that the injection will take place over a period of three weeks, with actual injections being done Monday through Friday.

A non-reactive tracer, preferably a compound not found in the groundwater, should be added to the hydrogen peroxide solution to help determine if any reduction of 1,4-dioxane concentrations is due to dilution or oxidation. Pall Life Sciences (PLS) should provide the Department of Environmental Quality (DEQ) with the information regarding the proposed tracer and quantity to be used for our approval prior to implementation.

An additional sampling event, using the first row of OWs (B-B') should be added on the third day of the test for the tracer, 1,4-dioxane, and ferrous iron.

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Dependent on the results of the last sampling event, an additional round of sampling may be required. PLS should provide all available sample results to the DEQ within five days of the collection of the last scheduled sampling event.

Static water levels should be collected from all observation wells during all sampling events.

It is our understanding that the observation wells will be vented to release any build up of gas in the wells. We recommend that field observations be made to determine if there is significant venting of gas.

Procedures for the introduction of hydrogen peroxide indicate the possible need to adjust the timing of the daily dose and the use of compressed air to pressurize the injection well. Detailed field notes must be taken to document the exact procedures used, and this information should be included in the final report on the test.

Table 1 indicates that temperatures will be taken weekly for all observation wells. This frequency should be increased to five days per week. We understand that the temperature of the injection well will be monitored periodically during the addition of the hydrogen peroxide solution and that appropriate adjustment of the dose will be made to avoid excessive heating.

Due to Pall Life Sciences' (PLS) intention to rely on *in-situ* oxidation for mass reduction, if the testing is successful, it is critical that this test be performed and analyzed in a way that adequately evaluates the amount of mass reduction that can be obtained with a specific volume of hydrogen peroxide at a given concentration. This information will provide the basis for evaluating the feasibility of using this method on a large-scale basis to attain an adequate level of mass reduction.

Initiation of this test is dependent on agreement by PLS to the additional clarifications and monitoring itemized above. Please provide us with your written agreement to implement the work plan as revised by these comments, and your implementation schedule, prior to initiating the work plan.

Sincerely,

Sybil Kolon
Environmental Quality Analyst
Gelman Sciences Project Coordinator
Remediation and Redevelopment Division
517-780-7937

SK/KL

cc: Ms. Mary Ann Bartlett, Pall Corp.
Mr. Robert Reichel, DAG
Mr. Mitchell Adelman, DEQ/GSI File
Mr. Leonard Lipinski, DEQ