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GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
JACKSON DISTRICT OFFICE



DAN WYANT  
DIRECTOR

September 5, 2012

VIA E-MAIL and U.S. MAIL

Mr. Farsad Fotouhi  
Corporate Vice President  
Environmental Engineering  
Pall Life Sciences, Inc.  
600 South Wagner Road  
Ann Arbor, Michigan 48103-9019

Mr. Michael L. Caldwell  
Zausmer, Kaufman, August & Caldwell, P.C.  
31700 Middlebelt Road, Suite 150  
Farmington Hills, Michigan 48334-2301

Dear Mr. Fotouhi and Mr. Caldwell:

SUBJECT: Gelman Sciences, Inc. Remedial Action  
Little Lake Area Evaluation of Reduction in Batch Purge Frequency  
August 1, 2012

The Department of Environmental Quality (DEQ) has completed its review of the above referenced report (Report). The DEQ has identified several deficiencies and concerns with the Report, as itemized below.

1. The table on page 3, Ann Arbor Cleaning Supply Well While Purging, has a note below it that states the samples were collected mid-way through purging; however, that does not appear to be the case in all instances. During a meeting with Pall Life Sciences (PLS) on August 14, 2012, Mr. Fotouhi indicated that purging does not begin before 8:00 a.m. According to PLS Sample Analysis Reports previously submitted to the DEQ, the samples from the Ann Arbor Cleaning Supply (A2CS) well on March 1, 2012 and June 7, 2012, were collected at 8:00 a.m. and 8:05 a.m., respectively. Therefore, these two samples could not have been collected mid-way through the purging and appear to have been collected before purging began. Any conclusions drawn regarding the effects of purging on 1,4-dioxane concentrations must be reconsidered because two of the five results cited are not consistent with the note below the table. The data should be presented to include the time of sample collection relative to the entire purging event.
2. The report failed to cite the second sample collected on March 1, 2012, at 12:05 p.m., presumably mid-way through the day's purging. That result was 98 parts per billion (ppb). It is unclear why PLS would not have used the second sample from that date to reflect 1,4-dioxane concentration after purging had commenced.
3. Item 2 on page 7 states that the concentration of 1,4-dioxane in the water purged was approximately 80 ppb. If this was based on the data cited above, it is likely to be underestimated by about 20 percent. The basis for this estimate should be provided and revised if needed.

4. The Report claims there have been no significant changes in Little Lake Area (LLA) compliance monitoring wells (CMWs) and therefore, the reduced frequency has not affected compliance with the non-expansion objective. The Report does not provide any information about how long it would take for the reduced purging to show an effect, if there were to be one. The DEQ does not have enough information to determine whether PLS's conclusion can be relied upon to predict the long-term effects of the reduced purging frequency.
5. The Report cites a rebound in water levels in the LLA that it attributes to a reduction of purging in the Western Area. Two graphs are provided that include the water level data from MW-53i. No other water level data or graphs are provided. A complete report, at a minimum, should include graphs of water level data from all monitoring wells in the LLA, and any other monitoring wells that are considered relevant to the evaluation.
6. The first paragraph on page 6 provides two possible explanations for the increase in 1,4-dioxane in the A2CS well and MW-53i during non-purge sampling: 1) the reduced batch purging frequency or 2) the site-wide rise in water levels. PLS believes this increase is due to increasing water levels, which has been observed before. While this may be the case, it is not possible to draw such a conclusion since there were two known variables that could be affecting the observed increase in 1,4-dioxane concentrations. Continuation of the reduced purging frequency, in combination with increased concentrations during non-purge events, could potentially result in expansion of the plume. A return to monthly purging would allow PLS to better evaluate whether the increase is associated with increasing water levels or decreased purge frequency. Regardless of the cause of the increase in 1,4-dioxane during non-purging conditions, there is a possibility that these concentrations will continue to increase.

In summary, the Report is not adequate to support PLS's request for a further reduction in purge rates, nor is it adequate to support continued quarterly batch purging.

Section V.C.2 of the Consent Judgment provides for the following response activities in the Little Lake Area System: "Defendant shall continue its batch purging program from the extraction well located on the Ann Arbor Cleaning Supply property pursuant to MDNRE-approved plans unless some other form of active remediation *is approved* by the MDNRE. Defendant may resubmit a proposal to *temporarily reduce* the frequency of the batch purging of this well so that the effects of batch purging can be evaluated." (Emphasis added.) Consistent with the Consent Judgment, the DEQ's approval of the reduction in frequency of batch purging was conditioned upon PLS resuming monthly purging after one year. This condition was based in part on a need to allow adequate time for the DEQ to evaluate the data from the reduced purging. It was also intended to evaluate how the system would respond to a return to monthly purging. Because the DEQ could not predict the results of the decreased purge frequency, the DEQ was not in a position, nor was the DEQ requested by PLS, to approve a continuation of quarterly batch purging after the proposed one-year test was concluded.

PLS's November 3, 2010, proposal (Proposal) for the reduced batch purging included the following language:

If after a year from the frequency adjustment there is an indication of increasing 1,4-dioxane concentrations at either well that can be correlated to the frequency change, and 1,4-dioxane concentrations in one of the wells is above 85 ug/L, PLS will either return to a monthly frequency, or propose an alternate frequency (less than quarterly) and commit to additional monitoring. Alternatively, if after a year, there is an indication

that there are decreasing 1,4-dioxane concentrations at either well that can be correlated to the frequency change, PLS will likely propose a further reduction in the batch purging frequency.

The possible scenarios outlined in PLS's Proposal did not occur or have not been proven. Although there was an increase in 1,4-dioxane in the A2CS well, PLS did not correlate it to the frequency change, due to PLS's belief that it could be from the increasing site-wide water levels. In any case, PLS indicated that it would propose an alternate frequency to the DEQ. The Report, dated August 1, 2012, was submitted two months after the fourth quarterly purging event was completed. It was the DEQ's expectation that PLS would return to monthly purging until PLS proposed and received approval for, an alternate purge frequency.

Based on the information provided in the Report, including increasing concentrations of 1,4-dioxane during non-purging events, the DEQ stands by its position that a return to monthly purging is warranted.

PLS apparently continues to believe that the source of the 1,4-dioxane in the LLA is Little Lake and the Honey Creek tributary, as stated by Mr. James Brode at our August 14 meeting. PLS has stated in the past that 1,4-dioxane previously used by PLS had reached the surface water and serves as a continuing source of groundwater contamination, even though PLS ceased using 1,4-dioxane in 1986. The DEQ has serious doubts about this assessment and is concerned that the decrease in purging from the Western Area could result in additional migration from the Western Area toward the LLA. For many years, PLS has asserted that this area would meet the criterion for 1,4-dioxane within a specific period of time, yet none of those predictions have been met. PLS now concludes, based on incomplete information, that the reduced purging frequency will not affect its ability to meet the non-expansion objective of the Consent Judgment.

In the five months prior to beginning quarterly batch purging (Jan-May 2011), samples were collected from the A2CS well on the same day as purging, between 11:20 a.m. and 1:10 p.m. The results ranged from 93 to 107 ppb. Based on information provided by Mr. Fotouhi, it appears these samples were collected after purging commenced. There appears to be a direct correlation between purging and an increase in 1,4-dioxane concentrations in the A2CS well that continues to this day. The DEQ believes this data supports the need to take a conservative approach to further reductions in purging.

PLS admittedly has disregarded the DEQ's condition to return to monthly purging because the non-expansion objective is being met, despite the fact that the Consent Judgment requires purging according to the DEQ-approved plans (unless PLS can obtain restrictions on affected properties), in addition to meeting the non-expansion objective. The DEQ acknowledges that there is no evidence of expansion at this time, but is not able to form an opinion about whether that will continue to be the case under quarterly purging, based on the information in the Report. PLS should return to monthly purging and continue with the currently approved monitoring plan until it is able to address the concerns addressed in this letter and the DEQ is able to make a final determination. This will assist PLS in determining whether the increasing concentrations were a result of the reduction in purging frequency or if it is related to the site-wide rise in water levels.

Please provide a revised report based on these comments, including all additional relevant data that has been collected, by October 26, 2012.

Mr. Farsad Fotouhi  
Mr. Michael L. Caldwell

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September 5, 2012

Should you require further information, please contact me at 517-780-7937;  
[kolons@michigan.gov](mailto:kolons@michigan.gov); or the DEQ Jackson District Office, 301 East Louis Glick Highway,  
Jackson, Michigan 49201.

Sincerely,

Sybil Kolon  
Senior Environmental Quality Analyst  
Gelman Sciences Project Coordinator  
Remediation Division

SK/ja

cc: Ms. Celeste Gill, Department of Attorney General  
Mr. Mitchell Adelman, DEQ/Gelman File  
Mr. James Coger, DEQ