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Ms. Sybil Kolon
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Remediation and Redevelopment Division
Jackson District Office
301 E. Louis Glick Highway
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Re: Pall Life Sciences' Response to June 23, 2008 Correspondence

Dear Ms. Kolon:

I am writing in response to the correspondence dated June 23, 2008 that Pall Life Sciences ("PLS") received from the Michigan Department of Environmental Quality ("MDEQ") regarding a variety of issues (the "MDEQ Letter"). PLS is providing a technical response under separate cover.

Valley Report and AE-3 Analysis.

The MDEQ states that it is unable to determine if PLS is in compliance with Section V.A.1(a) of the Consent Judgment, which requires PLS to intercept the leading edge of groundwater contamination in the Evergreen Subdivision Area. PLS rejects the implication that the MDEQ's recently developed inability (or unwillingness) to make this judgment is the result of PLS' failure to demonstrate that it has achieved the Consent Judgment objective. For almost two decades, PLS and the MDEQ have agreed that PLS should make this demonstration using two complementary sets of data: (a) capture zone analyses and modeling that provide a conservative depiction of what the extent of the capture zone should be given the purge rates then in effect; and (b) actual field data (both groundwater quality and hydraulic head

measurements) that are used to confirm the predicted capture zone. The field data are obtained from a network of wells that PLS and the MDEQ have jointly selected. The MDEQ's approval of this network of data points is documented in its approval of PLS' performance monitoring plans. The inability of MDEQ to now reach a conclusion appears to be more of a function of different technical reviewers with varying levels of expertise and different conceptions of data needs rather than some deficiency in PLS' performance.

The capture zone analyses PLS has submitted to the MDEQ, including the most recent analysis dated April 29, 2008, have consistently shown that the extraction scenarios and purge rates then in effect were sufficient to achieve the Consent Judgment objective. The data from the *MDEQ-approved* network of performance monitoring wells have demonstrated and continue to demonstrate that the Evergreen System extraction wells are intercepting the leading edge of the groundwater contamination. There are no data from these wells that even suggest that the groundwater contamination has migrated beyond the capture zone of the Evergreen System extraction wells. Therefore, based on the criteria established by the MDEQ, PLS has met its legal requirement under the Consent Judgment and any suggestion to the contrary is without legal or technical basis.

PLS is surprised and concerned by the MDEQ's refusal to honor its previous approval of PLS' current performance monitoring plan and the data from certain wells included in that plan. The MDEQ's recently-developed dissatisfaction with the existing dataset flies in the face of its previous approval of this very dataset and the effort expended by both the MDEQ and PLS technical staff to develop an acceptable performance monitoring plan. The location, depth, and configuration of each well and the sufficiency of these data points were thoroughly discussed, debated, and ultimately agreed upon by the MDEQ and PLS. The current performance monitoring plan reflects the knowledge and experience the MDEQ and PLS have gained over the last twenty years. While PLS welcomes the perspective of the newly-assigned MDEQ technical staff, it is inappropriate – and PLS believes without legal effect – for the MDEQ to contradict and undermine its previous approvals, especially in the absence of any significant new data that justify such a dramatic about face.

PLS, of course, recognizes that this is a dynamic system and that new and different data can justify new and different conclusions. PLS has always been open to discussing, and in the past has often agreed with, the MDEQ's specific requests for additional data points. Monitoring wells MW-92, MW-110, and MW-113 were all installed in response to specific MDEQ requests, which were supported by sound technical justification. In each case, the additional data from the new monitoring well confirmed PLS' compliance with the Consent Judgment. In this instance, however, rather than offer discrete suggestions for supplementing the previously-approved dataset, the MDEQ appears to have concluded that none of the approved data points can be relied upon. This is an unwarranted conclusion that even Mr. Mandle's technical memorandum does not support.

PLS believes that Mr. Mandle's memorandum represents a good faith review of the Evergreen System data. However, none of the concerns he raises justifies the MDEQ's conclusion that the data from the approved network of wells are no longer sufficient to enable

MDEQ to evaluate PLS' compliance with the Consent Judgment.¹ The vast majority of his concerns relate to questions regarding the ability of the LB wells to capture the entire width of the plume. The MDEQ Letter's discussion of the data from MW-BE-1, 456 Clarendon and 593 Allison is also limited to this issue. While questions regarding the extent of the LB capture zone are germane to the question of whether PLS can discontinue the operation of AE-3, they are not germane to determining PLS' compliance with the Consent Judgment. Whether 1,4-dioxane is migrating past the LB wells is irrelevant so long as AE-3 continues to capture the groundwater contamination in that area. The only discussion directly relevant to PLS' compliance with the Consent Judgment is Mr. Mandle's analysis regarding the data from MW-92, MW-110 and MW-101. However, as discussed in PLS' technical response, Mr. Mandle's interpretation of the data from these wells is incorrect and does not support the conclusion that the Evergreen System extraction wells have failed to capture the Evergreen plume.

Nor does Mr. Cogger's conjecture regarding an alternative source for the deeper contamination in the Dupont Circle area support his apparent conclusion that the previous MDEQ-approved delineation should be discounted. Although never clearly stated, Mr. Cogger seems to be asserting that 1,4-dioxane from the area of TW-11 flows directly toward the Dupont Circle area and that the existing well network is not sufficient to delineate the extent of the plume if it is migrating in this direction. As discussed in PLS' technical response to Mr. Cogger's memorandum, this new theory regarding the source of the Dupont Circle contamination is contradicted by groundwater flow direction data west of Wagner Road and the absence of 1,4-dioxane in the relevant portion of the aquifer at MW-118 (which is located directly between TW-11 and the Dupont Circle area). The MDEQ's basis for dismissing the parties' longstanding belief that the source of the Dupont Circle contamination is the area east of MW-30d is flawed, as further discussed in PLS' technical response.

Based on the above discussion and for the reasons set forth in greater detail in PLS' technical response, PLS does not believe that there is either a legal or technical basis for the MDEQ's request for a work plan for gathering additional data to demonstrate PLS' compliance with the Consent Judgment.² The existing, previously-approved dataset is sufficient to confirm

¹ Nor does the availability of new drilling and sampling techniques render previously agreed upon data points useless. The MDEQ's current emphasis on vertical aquifer sampling ("VAS") is the most recent of example of MDEQ's tendency to emphasize expensive technology over sound professional judgment. Certainly this technology can yield useful information in appropriate situations, and PLS has routinely employed it despite its cost. But the recent availability of this technology does not mean that the previous decisions made by the MDEQ and PLS regarding well locations and well depths were baseless or that the data from these data points is meaningless. Evaluation of what weight to give data from a particular well requires evaluation of a number of factors, including aquifer thickness, location of the well screen, the specific geology in that area, etc. These factors were all considered by PLS and MDEQ technical staff before any data point was deemed valuable enough to be included in the approved performance monitoring plan. PLS realizes that it is difficult for the recently-assigned MDEQ staff to recreate this analysis, but the MDEQ cannot simply avoid this exercise by jettisoning any data point that was established without the benefit of VAS.

² Nor do the MDEQ's concerns regarding the 1,4-dioxane detected at MW-100 support the assertion that PLS has failed to capture the leading edge of contamination in the Evergreen Subdivision area. As discussed in PLS' technical response to Mr. Cogger's memorandum, the data from 373 Pinewood rules out any meaningful migration of 1,4-dioxane from the MW-100 area into the Evergreen Subdivision area.

PLS' compliance with the Consent Judgment objectives. As always, PLS is receptive to any specific suggestions the MDEQ may have regarding additional monitoring wells to supplement the existing data set, provided that the request is supported by a reasonable technical rationale. It is unhelpful for MDEQ to amplify the disagreements over alleged data gaps to the point where the entire Evergreen System program is dismissed as unusable. PLS sees no basis for the MDEQ's request to essentially start over in this regard.

Mr. Mandle's analysis does support the MDEQ's conclusion that there is not enough data to resolve the questions identified in the Dispute Resolution Stipulation. PLS reached the same conclusion in its April 2008 Valley Drive Report. The question is whether it makes sense to continue this investigation. For the reasons PLS has already discussed with the MDEQ, PLS believes it would be a waste of resources to continue to investigate these issues, which are largely academic as long as PLS is able to operate AE-3. PLS hopes to meet with the MDEQ to discuss possible alternatives to this scenario because PLS continues to believe that purging from the Allison Street location is not a reliable long-term option.

Dupont Report

PLS also strongly disagrees with the MDEQ's assertion that PLS has failed to define the vertical and horizontal extent of the 1,4-dioxane in the Dupont Circle area. PLS has delineated the extent of the Evergreen plume in this area pursuant to MDEQ-approved work plans over the last two decades. The MDEQ's new theory regarding the origin of the contamination in the Dupont Circle area does not render the MDEQ-approved delineation a nullity. The MDEQ's current speculation that this contamination originated in the area of TW-11 is contradicted by the groundwater flow direction data west of Wagner Road, which the MDEQ misconstrues. As set forth in PLS' technical response to Mr. Cogger's memorandum, groundwater in this area flows to the east, not northeast toward the Dupont Circle area. The MDEQ's theory is also ruled out by the data from MW-118, which was installed to delineate the northern extent of the Unit E contamination crossing Wagner Road (no groundwater contamination was identified in the lower, Unit E, portion of the aquifer). This well lies directly between TW-11 and the Dupont Circle area and it is implausible that groundwater contamination could be traveling directly between these two points without it showing up at MW-118 at significant concentrations.

PLS has presented more than enough data (both groundwater quality and flow direction data) to reasonably exclude the possibility that Unit E contamination is flowing directly from the area of TW-11 to the Dupont Circle area. As discussed in the attached technical response, the MDEQ's attempt to rule out the area east of MW-30d as the source of the Dupont Circle contamination is based on a flawed analysis of the data from this area. PLS continues to believe that this area is the likely source of the contamination. Regardless of the source, however, there are no data to suggest that the vertical and horizontal extent of the contamination in the Dupont Circle area has not been fully delineated and that it is not being captured by the Evergreen System extraction wells.

Wagner Road Area

As set forth below, PLS does not believe that there is a legal basis for the MDEQ's demands for additional response activity in this part of the site. This does not mean, however, that PLS is opposed to discussing with the MDEQ the issue of whether the legal requirements for part of the site should be modified to better reflect the parties' current understanding of the conditions at Wagner Road. PLS has recently suggested just such a meeting, and PLS does not want the following discussion of PLS' position with regard to its current legal obligations to obscure its willingness to address these broader issues.

Having said that, PLS is constrained to respond to the MDEQ's demands for additional response activity under the current legal framework. Specifically, the MDEQ has demanded that PLS: (a) define the extent of all of the groundwater contamination in the Wagner Road area, regardless of what aquifer it is in; and (b) capture all of the groundwater contamination at Wagner Road regardless of what aquifer it is in or provide a demonstration that it is not feasible to do so. These demands are based on two faulty premises: (a) that PLS is not capturing the groundwater contamination within the Unit E aquifer; and (b) that PLS is required to address the groundwater contamination in the D₂ aquifer at this location.

As the MDEQ is well aware, PLS' only obligation (albeit conditional) to capture ground water contamination at Wagner Road is limited to the contamination contained in the Unit E aquifer. As set forth in its March 2007 Performance Review and as confirmed by subsequent investigation and data, PLS is accomplishing that objective.

The MDEQ's October 31, 2007 response to PLS' March 2007 Performance Review claimed that PLS had failed to show that its extraction from TW-18 was capturing both the southern and northern edges of the plume. Its conclusion with regard to the southern edge was based on data from MW-105d, which the MDEQ felt showed that the TW-18 capture zone did not extend this far south. PLS disagrees with this interpretation and believes the field data support the conclusion that the capture zone extends in this direction even farther than the conservative analytical capture zone calculations would predict because of the thinning of the aquifer in this area. Perhaps more importantly, the source of the groundwater contamination present at MW-105d has already been removed by previous extraction from TW-12, where levels have been reduced below 85 ppb. In its October 31, 2007 response, the MDEQ agreed with PLS' suggestion that concentrations in MW-105d be monitored to determine if a decreasing trend is established. (*See Coger 10/31/07 Interoffice Communication.*)³ Recent data from this well continue to confirm that the source for this contamination has already been cut off by PLS' prior extraction:

³ In its October 31, 2007 response, the MDEQ determined that continued monitoring in this area was protective of public health because the contamination in this area is within the Prohibition Zone.

<u>Date</u>	<u>Result (ppb)</u>
8/03/06	1,104
10/12/06	1,035
1/12/07	980
4/11/07	872
7/13/07	932
10/04/07	854
1/08/08	755
4/14/08	719

Continued monitoring in this area appears to be the appropriate response with regard to the MW-105d area.

In its October 31, 2007 response, the MDEQ asserted that PLS could not demonstrate that the operation of TW-18 was capturing the northern edge of the Unit E plume because PLS had not defined the extent of contamination in that area. PLS addressed this concern by installing MW-118, which was vertically sampled to bedrock. No groundwater contamination was discovered in the Unit E aquifer at this location.⁴ Having defined the northern extent of the Unit E groundwater contamination, it is now clear from PLS' capture zone analysis that the TW-18 capture zone will capture the northern edge of this plume.

Based on the above discussion, and as detailed in PLS' March 2007 Performance Review, PLS believes that it is satisfying the objectives of the Court's Unit E Order. The fact that it is not easy to immediately demonstrate the desired capture with field data should come as no surprise. PLS has consistently pointed out that demonstrating the effectiveness of a mid-plume capture with field data would be very difficult under the best of circumstances. The additional challenges presented by the presence of extensive wetlands and lakes just east of Wagner Road make this challenge even more daunting. The predicted and unavoidable difficulty and delay in acquiring unequivocal field data demonstrating capture is not a basis for concluding that PLS has not met the objective.

Nor does the absence of a geological separation of the D₂ and Unit E aquifers in the MW-94 area support the MDEQ's attempt to compel PLS to capture the groundwater contamination present in both aquifers. PLS understands that the MDEQ would like PLS to capture all of the groundwater contamination crossing Wagner Road, but there is no legal requirement for PLS to do so nor any measurable environmental benefit to be gained.

It also seems obvious to PLS that it would not be feasible to capture all of the groundwater contamination migrating past Wagner Road, even if that was the mutually desired objective. PLS cannot simply turn off onsite wells and transfer that purge volume to Wagner

⁴ PLS did, however, install a monitoring well at this location in the shallower D₂ portion of the aquifer where groundwater contamination was discovered. Because the boring was initially installed to define the extent of the Unit E contamination, this well was incorrectly classified as a Unit E well in PLS' database. The aquifer designation will be corrected, and this well will be identified as a D₂ well in future versions of the database.

Road and expect to achieve capture. Any reduction of purging west of Wagner Road will, after an equalization period, simply increase by that same amount the volume of water that must be extracted from Wagner Road. This is a matter of basic hydraulics. Thus, unless the MDEQ thinks that the 50 to 100 gpm of potentially available capacity will be sufficient to capture the entire D₂ plume, PLS suggests that the parties pursue more realistic alternatives.

Maple Road Performance Monitoring

As set forth in previous correspondences, PLS has consistently and repeatedly argued that the existing network of monitoring wells in Veteran's Park is sufficient to monitor whether PLS is preventing groundwater contamination in excess of 2,800 ppb from migrating past Maple Road. The MDEQ, however, insisted that PLS install three wells immediately east of Maple Road, in the already crowded Veteran's Park. The sole purpose of these wells would be to confirm PLS' compliance with the Unit E objective. Especially troubling was that the MDEQ continued to insist on a well directly upgradient from the existing MW-84 location, even though the MDEQ could not identify any technical reason why the MW-84 wells could not serve as an acceptable compliance point. The MDEQ argued that as a legal matter, the MW-84 location is 500 feet further away from Maple Road than the MDEQ's preferred location.

Despite ample technical support for its position, PLS decided to comply with the MDEQ's demands in order to avoid a costly legal battle. PLS has already installed MW-115 and MW-116 at the locations demanded by MDEQ. Unfortunately, PLS encountered drilling refusal both times it attempted to install the well between MW-84 and Maple Road due to the presence of underground boulders. Having made two costly attempts to install this unnecessary well, PLS renewed its suggestion that MW-84 be used to monitor PLS' compliance. The MDEQ rejected this suggestion and, as set forth in the MDEQ Letter, continues to demand that PLS install this well, despite the unfavorable geology in this area.

PLS is not willing to waste its time and financial and technical resources in yet another attempt to install a well that serves no useful purpose. The MDEQ will simply have to accept the MW-84 location as the third performance monitoring well or convince the Court that having a well 500 feet closer to Maple Road is important. PLS believes that the 500 feet difference between the two locations is irrelevant given the fact that the next closest surface water receptor (the Huron River) is approximately 9,500 feet further downgradient.

Operational Decisions

PLS has responded to this request on several occasions, but will restate its position again. PLS routinely provides the MDEQ with all the raw data the Consent Judgment requires PLS to provide and considerably more information on day-to-day activities. Even though not required to do so, PLS also shares its work product by producing many of the spreadsheets and databases it has developed to manage and manipulate the raw data PLS is required to provide. PLS realizes that the data management challenges associated with this site are considerable and believes that assisting the MDEQ in this way is appropriate because it facilitates the MDEQ's ability to fulfill the oversight role assigned to it by the Consent Judgment. PLS, however, is not required to share

its thought processes or to document the basis for its operational decision-making. PLS is not inclined to do so because under the Consent Judgment, PLS -- not the MDEQ -- is responsible for these remedial decisions. Involving the MDEQ in PLS' operational decision-making will only slow down the cleanup and reduce PLS' ability to respond to changing conditions. PLS also respectfully suggests that further involvement of the MDEQ in operational decisions has not historically delivered any significant benefit to either party in terms of "approvals" of planned courses of action. As evidenced by the MDEQ Letter, past agreements by the MDEQ on operational decisions apparently carry little or no weight, whether it be the decision to install nested wells at certain locations or to move the LB extraction further north. Moreover, leaving operational decisions to PLS removes MDEQ from having to make judgments about the adequacy of proposed actions in the face of constant internal and external criticism that there is never enough information to back up operational decisions made at the site.

As the MDEQ acknowledges, neither the Consent Judgment nor any of the related court orders require PLS to summarize the basis and rationale of its operational decision-making. Indeed, the Court took just the opposite position when it approved and adopted PLS' 5-Year Plan. The 5-Year Plan allows PLS to implement changes in purge well locations and purge rates and to make changes to the remedial system with notice to, but without the need to secure approval of, the MDEQ. This change freed PLS to take responsibility for the cleanup and allowed the MDEQ to focus on its assigned oversight role. Under this court-mandated process, if the MDEQ believes that PLS' decision-making is hurting the cleanup, its remedy is to petition the Court. PLS thinks all would agree that the cleanup has benefited from this change, and PLS is not willing to return to the prior process that nearly brought the cleanup to a standstill.

PLS understands that the MDEQ does not believe that requiring PLS to share this information will bring about this undesirable result. PLS, however, is quite confident that the cleanup will suffer if it is required to justify each and every operational decision it makes. From PLS' perspective, providing the requested information is tantamount to inviting not only the MDEQ but also third parties who have their own agenda into PLS' decision-making process. This is not acceptable to PLS, nor do we think to the Court.

This is not to say that PLS does not acknowledge the importance of MDEQ's oversight role in this cleanup. As evidenced by the MDEQ Letter, PLS has provided the information the MDEQ needs to fulfill its role in the cleanup. Mr. Mandle, with the assistance of the EPA software, has apparently generated various graphs and spreadsheets he has used to evaluate the data from PLS' purge wells. While PLS questions the MDEQ's characterization of this exercise as "complex data analysis" -- PLS has employed similar or more sophisticated analyses for many years -- PLS is certainly willing to consider any specific suggestions the MDEQ develops as a result of these analyses. If PLS refuses to adopt the MDEQ's suggested changes to its groundwater extraction system, the MDEQ is free to seek the Court's intervention.

Well Identification Report

PLS is in receipt of the MDEQ's recent correspondence regarding this issue and will respond to the specific issues raised in that letter. In general, however, it is PLS' position that

the May 2005 Order Prohibiting Groundwater Use (the "PZ Order") required PLS to submit a work plan setting forth the steps it would take to determine if there were any private drinking water wells located within the Prohibition Zone and, upon approval of that work plan, carry out the identified tasks. PLS complied with each of these requirements, as the MDEQ previously acknowledged in its initial response to PLS' Well Identification Report. The PZ Order does not require PLS to comply with subsequently developed guidance documents, especially ones that are not even relevant to this Site.

PLS has already gone well beyond what could have been reasonably expected of it in this regard and has presented a thorough analysis of the parcels included in the Prohibition Zone along with its rationale for its conclusion that the requirements of the PZ Order have been met. PLS is willing to discuss the MDEQ's belatedly raised objections to the previously approved work product, but is not inclined to perform any additional work in this regard.

Notice of Migration

PLS has not yet received any correspondence from the Attorney General's office on this topic, so PLS will only respond briefly. As PLS has explained in previous meetings with the MDEQ, neither the Consent Judgment nor the Part 201 Administrative Rules require PLS to provide individual notices of migration to each property owner in the vicinity of the Unit E groundwater contamination. PLS believes its legal argument in this regard is strong. Perhaps more importantly, however, individual migration notices would not serve any useful purpose in this situation. PLS continues to be perplexed as to why the MDEQ would insist that PLS provide such notices.

In appropriate circumstances, migration notices can serve an important function. They provide information to property owners regarding the nature of contamination that may have migrated onto their properties, which allows the property owner to take whatever steps are necessary to avoid unacceptable exposures to the contamination. In this situation, however, such knowledge would not benefit the property owner in any way. The only possible "unacceptable exposure" to the groundwater would occur if someone drank it. Here, however, the groundwater contamination is many feet below ground, there are no water wells in use in the affected area, and the PZ Order, which has already been published, makes it illegal to drink the groundwater. Therefore, there is no possibility that there will be any unacceptable exposures to the groundwater contamination and no additional measures individual property owners can or should take. In these fairly unique circumstances, the notice of migration would serve no useful purpose, and PLS is perplexed as to why the MDEQ continues to suggest that the parties dedicate limited resources to this issue.

PLS remains willing to discuss possible alternatives to individual migration notices.

Conclusion

PLS agrees with the MDEQ's statement that PLS' compliance must be evaluated based on the legal requirements currently in effect. PLS believes that any concerns in that regard will be put to rest by an objective review of the information and analysis presented in PLS' responses to the MDEQ's technical memoranda. PLS is committed to working with the MDEQ to resolve any remaining disagreements amicably.

PLS also agrees with the MDEQ's previously expressed observation that a fresh review of the existing legal framework in light of the parties' current understanding of the nature and extent of the contamination would be in the interests of both parties and the public. PLS renews its request for a meeting with the MDEQ to discuss these issues further.

Very truly yours,

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