

**Comments on “Supplemental Peoria County Staff Report for  
Peoria Disposal Company Application for Local Siting Approval”**

dated April 3, 2006

Comments by

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*These comments were developed and made available for the purpose of improving the quality of science and engineering used in public policy development for environmental quality management.*

On April 3, 2006, the Peoria County staff issued a Supplemental Report “For Peoria Disposal Company Application for Local Siting Approval” in which the staff attempted to justify their recommendation that the Peoria Disposal Company (PDC) be allowed to continue to operate its hazardous wastes landfill. Based on the comments, the County Staff has limited understanding of key technical issues that the County Board needs to be provided on the near term and long term impacts of the continued operation of the PDC hazardous waste landfill. The staff comments were in several instances highly superficial and ignored what is well known in the environmental quality management field concerning the potential impacts of a hazardous waste landfill that is improperly sited, monitored, and most importantly is inadequately funded for the infinite period of time that the wastes in the landfill will be a threat to public health, groundwater resources and the environment.

Based on the Peoria County Board staff (Staff) that prepared the April 3, 2006 comments, this staff has very limited understanding of chemical issues that must be considered in making reliable recommendations to the County Board upon which the Board can review the application for continued operations of the PDC hazardous waste landfill. Some of the significant technical errors that the County Board staff made in review of my report are summarized below.

In the comments presented below I have copied the section of my comments that the Staff has chosen to comment on in regular type followed by the Staff response in italic.

On page 8 the Staff quoted my report and stated,

"The proposed hazardous waste landfill expansion application fails to discuss the fact that many of the waste components that are proposed to be deposited in the landfill expansion will be a threat to the public health, groundwater resource quality and the environment forever." (Lee, Comments, p.5) *There is no requirement for PDC to discuss this as the existing permits, operation and design, as well as present laws and regulations, allow*

*them to accept these wastes in a landfill designed that meets the existing technology requirements by USEPA and IEPA. The County cannot impose conditions upon approval or make a decision on the application which is inconsistent with applicable laws and regulations. However, the County may impose special conditions consistent with their siting ordinance, including perpetual care. This will be addressed in Criterion 5.”*

As discussed in my comments, counties in various parts of the US understand the deficiencies in current US EPA and state landfilling regulations and as a result are taking action to impose more stringent landfilling requirements than that required at the federal and state level. The Flawed Technology review discusses the significant well known deficiencies in current federal and state landfilling regulations in protecting the public and the environment from the hazards of landfilled wastes. The Peoria County Board has the obligation to consider the potential impacts of the proposed landfill expansion to the current and future generations that wish to live in the Peoria area.

On page 9, the Staff quoted my report and stated,  
"These areas are likely releasing hazardous chemicals to the atmosphere which are trespassing onto adjacent properties." (Lee, Comments, p.14) *Lee presents no proof of his claims, and there is no evidence or data in the record which would tend to support Lee's accusation. Due to the characteristics of the major waste disposed of at PDC, which are primarily inorganic wastes consisting of metals not prone to vapor phase transport, County Staff does not consider these remarks as particularly credible. Furthermore, daily cover is required and dust control also is required by PDC's operating permit to prevent particulate emissions.”*

This response is an example of the superficiality of the County Boards Staff approach in addressing technical issues. I provided the County Board with a discussion of what is well understood in the technical literature that both municipal and hazardous waste landfills release hazardous gases to the atmosphere that are a threat to the health of those near the landfill. PDC has reported highly volatile chemicals in its leachate such as vinyl chloride. Vinyl chloride is a known human carcinogen that is commonly present in landfill gaseous emissions. Those who understand chemistry know that if this chemical is found in leachate it is also likely present in landfill gaseous emissions. I also discussed the fact that the types of chemicals monitored in leachate and landfill gas by PDC represent a very small part of the 6 million chemicals that are in commerce today and that could be present in industrial hazardous wastes. I specifically discussed in the Flawed Technology review (see pages 36 and 37) that was provided to the County, the work of C. Daughton of the US EPA on the gross inadequacies of the current hazardous chemical monitoring programs that are being allowed by state regulatory agencies.

With regard to the Staff's statement, *“Due to the characteristics of the major waste disposed of at PDC, which are primarily inorganic wastes consisting of metals not prone to vapor phase transport,”* this is more of the inadequate information that the Staff is providing the Board. It appears that the Staff does not recognize that the PDC reports of leachate characteristics show the presence of several solvents and solvent degradation products. Examination of the chemical characteristics of the leachate shows that the PDC

waste stream contains sufficient solvents to cause the leachate to be a significant threat to airborne releases and to cause significant groundwater pollution by solvents. As discussed in my comments on the PDC application for expansion and in Flawed Technology and as is well known in the landfill pollution of groundwaters by landfill leachate, solvents of the type found in PDC leachate can rapidly penetrate through HDPE plastic sheeting liners (without holes) by permeation in a few days. These solvents are rapidly transported in groundwater aquifer systems without sorption on the aquifer solids. Further, many of these solvents are regulated as carcinogens in domestic water supplies.

The Staff statement that "*County Staff does not consider these remarks as particularly credible.*" is an example of the superficial approach that the Staff has followed in reviewing the comments received. It is common sense that if a landfill has gaseous emissions that are not adequately or not treated at all such as for the PDC landfill, and it is well understood that there are a large number of chemicals in the gaseous emissions from a landfill, that there will be unmonitored unregulated chemicals in the air borne emissions that are a threat to the health of those who reside and/or use properties near the landfill.

On page 9 the Staff quoted my report and stated,

"The inadequate buffer lands lead to a situation where airborne releases of regulated and currently unregulated hazardous chemicals, through of-gases and volatilization, have limited opportunity for dispersion on PDC property before trespass onto adjacent properties." (Lee, Comments, p.4) *No evidence is provided to support this claim, and none is found in the record.*

Again, the staff has demonstrated their limited technical competence in reliably addressing basic technical issues in providing comments. It did not occur to me that in order for a statement to be considered credible I would have to put the differential equations into the record that govern dispersion of gaseous releases from a source such as a landfill. It is common sense that the amount of dispersion of hazardous chemicals from a source such as a landfill depends on the distance from the point of release from the source. As I pointed out the PDC landfill was allowed to be developed without adequate bufferlands between the landfilled wastes and adjacent properties with the result that the users of those properties are exposed to a much more concentrated airborne mixture of chemicals than would occur if the landfill had been properly sited with adequate buffer lands.

On page 12 the Staff quoted from my report and stated,

"Since PDC proposes to only maintain the superficial aspects of the cover for the minimum post closure period of 30 years, there will be need for someone to maintain the cover after that period, after PDC attempts to walk off and leave the responsibility for continuing monitoring, maintenance and eventual remediation for someone else to pick up. Will this be the responsibility of the County? If not, who will provide the funds to accomplish this?" (Lee, Comments, p.1 1) *This comment simply highlights the need for the Perpetual Care Fund.*

As I discussed in my comments, the perpetual care fund will need to be adequate to periodically replace the low permeability layer of the cover. Did the County staff include funds to replace the plastic sheeting in the cover during the infinite period of time that the wastes in the PDC landfill will be a threat to generate leachate when contacted by water? This funding will be needed forever not just the 100 years assumed by the Staff.

On page 12 the Staff quoted from my report and stated,  
"The construction and operation of a leak detectable cover on the landfill... provides a means to determine when the plastic sheeting layer in the cover will no longer prevent moisture from penetrating through it and thereby generating leachate." (Lee, Comments, p.21) *Dr. Lee does not provide a design of such a cover system.*

This is another of the superficial comments provided by the staff in responding to comments in the deficiencies in the PDC application. It is not the responsibility of a reviewer of a proposed landfill or landfill expansion to **design** the landfill for the applicant. In my comments I provided references to leak detectable cover design.

On page 13, the Staff stated, "  
*Given the importance of cap permeability, although the design of the cap, according to testimony by PDC, meets the RCRA standards, staff would suggest an additional layer of geonet to further ensure quick drainage off the top of the low permeability layer, and a 2 foot thick recompacted clay low permeability layer underneath the geomembrane as added insurance that further minimize infiltration into the waste.*"

Again the Staff has failed to provide reliable information to the Board on the ability of the original and their proposed redesign of the cover to prevent water from penetrating into the landfill for as long as the wastes in the landfill will be a threat - forever. As discussed in my comments with additional discussion in Flawed Technology, the key to keeping the waste dry and thereby preventing leachate generation that can lead to groundwater pollution is the plastic sheeting in the cover. This layer will deteriorate over time due to free radical attack and allow any water that penetrates through the soil layer above it to pass into the soil layer below the plastic sheeting. As I discussed the soil layer will develop desiccation cracks that can allow large amounts of water that passes through the plastic sheeting to enter the wastes and generate leachate. The Staff approach will not stop leachate generation for as long as the wastes in the landfill will be a threat to generate leachate.

On page 13, the Staff quoted from my report and stated,  
"Daniel has not discussed the fact that the key element in preventing water from passing through the cover is the plastic sheeting layer in the cover. This plastic sheeting layer will degrade, likely at a faster rate than the bottom liner plastic sheeting, because of the greater exposure conditions that lead to free radical formation." (Lee, Comments, p.24) *Dr. Daniel agrees that eventually the HDPE material will lose strength, but has a differing estimate of the timeframe, but further highlights the need for care of the facility after closure. The perpetual care fund will ensure cap maintenance and integrity.*

The Staff's statement, "*The perpetual care fund will ensure cap maintenance and integrity.*" is another of the Staff's highly superficial statements that is designed to mislead the Board on technical issues. At best the perpetual care fund will provide for adequate funding for landfill maintenance including landfill cover maintenance for a very small part of the time that the wastes in the PDC landfill will be a threat. When these funds are exhausted then either the landfill cap will not be maintained or the County or some other entity will have to provide the very large amount of funds needed to maintain the landfill cover integrity.

On page 13, the Staff stated,

*"USEPA generally concludes that leachate generation from a properly capped facility should be minimized in 8 to 10 years following capping. So the amount of leachate should be minimized well within the 30-year post-closure period if the cap operates as expected."*

This is another of the highly misleading- inadequate statements made by the Staff. First no reference is given to the source of the US EPA statement. It should have been provided. Does it apply to the total period of time that the wastes in the landfill will be a threat or just to a short period of time compared to the time that postclosure care funding will be needed after the cover is installed on the landfill? This issue was discussed in detail in the Flawed Technology review and in my comments on the eventual problems with the PDC landfill cover. As discussed, if a landfill cover plastic sheeting layer is properly installed it can prevent water from penetrating into the landfill. However over time the plastic sheeting will deteriorate and the soil layer in the cover will not prevent water from entering the wastes that will generate leachate. As discussed in the Flawed Technology review the California Integrated Waste Management Board (see pages 39-40) has reviewed this situation and has independently determined that the period of low leachate generation (dormant phase) will be followed by renewed leachate generation as the plastic sheeting in the cover deteriorates and allows water to enter the wastes. It is highly misleading and deceptive for the Board Staff to suggest that the initial lowering of leachate generation rate will persist through the period of time that the wastes in the PDC landfill will be a threat to generate leachate when contacted by water.

On page 13 the Staff stated,

*"However, the Perpetual Care Fund provides for the continued inspection of the system after the post-closure care period, and further provides for the extraction of any leachate that might be generated sometime in the future."*

The Staff has persisted with providing the County Board with highly misleading information on what can be accomplished by the so-called perpetual care fund.

On page 3 paragraph 2 the Staff stated,

*"County Staff continues to believe that a cautious approach to expansion of the landfill coupled with the establishment of a perpetual care fund to address maintenance, care and monitoring of the site well beyond the regulatory post-closure care period is not only*

*prudent, but is the approach which provides the most protection for the citizens of the County.”*

On page 4 last paragraph the County Staff stated,

*“Using these figures it is estimated the fund would have approximately \$20,983,794 when it is projected PDC will have concluded its post-closure care period in the year 2054. That amount is estimated to provide sufficient funds to cover the cost of maintaining and monitoring the site for at least 100 years.”*

The County Board should require that its Staff provide a detailed cost accounting of what they considered in concluding that proposed \$20,983,794 post closure fund would be adequate to meet all plausible worst case failure situations need for funding for “at least 100 years.” This analysis should include a detailed listing of the costs of postclosure monitoring, maintenance and remediation that could occur during this period. This analysis should be made public so that an independent assessment could be made of its potential reliability.

Those who understand the chemical processes that will take place in the PDC landfill know that the wastes in this landfill will be a threat **forever**. There is no chemical, biological or physical process that will render the hazardous wastes in the PDC landfill a non threat to produce leachate that can pollute the groundwaters in the vicinity of the PDC landfill. The Staff should explain who will provide the postclosure funds for the PDC landfill for as long as the wastes in the landfill will be a threat. Without this analysis the Staff conclusions on the adequacy of the proposed postclosure funding is at best superficial.

On page 13-14 the Staff quoted my report and stated,

*“When leachate is detected in the leak detection system between the primary and secondary liner systems, it is known that the liner system has failed and that it is only a matter of time until the secondary liner system will fail if it has not already done so.” (Lee, Comments, p.10) According to PDC testimony, the primary liner performed as predicted in “de minimus” levels that USEPA approved according to their consultant’s predictions for the specific liner designs. The data from PDC on leachate flow from the primary to the secondary system shows that it is reduced by over ten-fold or greater into the secondary system. The mere fact that leachate is being collected in the secondary system does not mean the primary system has failed. In fact, USEPA has built into the regulations that leachate is collected as soon as it is detected in both primary and secondary systems and removes head (i.e., the potential for fluid to migrate into the liner) from the liners.”*

Again more of the misleading statements made by the Staff that is designed to mislead the Board. The facts are that the US EPA allowing small amounts of leachate to be collected in the secondary system. This situation is a reflection of the basic flawed technology of trying to use plastic sheeting to prevent leachate from failure to be collected in the landfill leachate collection even when the liner system is new. The initial liner failure to prevent leachate from occurring the secondary liner system is a failure to

be able to construct a liner system without holes. It is also an undisputable fact that over time the primary and secondary liner system will deteriorate and ultimately fail to prevent groundwater pollution by landfill leachate. This is the issue that the Staff should have informed the Board rather than the misleading technically invalid pro-landfill development statements that occur through the Staff Supplemental Report.

On page 14, the Staff quoted from my report and stated,

"A composite liner system can be effective in collecting leachate that penetrates both the primary and the secondary liner systems." (Lee, Comments, p.10) *In the Illinois EPA's report to the Legislature (A Study of the Merit and Effectiveness of Alternative Liner Systems, January 2003), Joyce Munie and Dr. Daniel state that there are no known releases to groundwater from a Subtitle D composite lined landfill anywhere in the US to their knowledge.*

This is another example of the superficial approach by the Staff to addressing comments, I provided a detailed discussion of why the Daniel statement of no know evidence of groundwater pollution by a double composite lined landfill provides no reliable information on the ultimate failure of plastic sheeting and compacted clay liners to prevent groundwater for as long as the wastes in the landfill will be a threat to produce landfill leachate. As is obvious to those who understand this situation, its is too early to see groundwater pollution from plastic sheeting lined landfills since they have only been used a few years. Further the unreliable groundwater monitoring approach with monitoring wells spaced hundreds of feet apart would not have been expected to see groundwater pollution at this time. It is only a matter of time until widespread groundwater pollution will be found by plastic sheeting and clay lined landfills. The Staff should have informed the Board about this situation.

On page 14, the Staff quoted from my report and stated,

"The inevitable leachate generation that will occur in post-closure year 31 and beyond will eventually lead to leachate transport of hazardous chemicals to the underlying groundwaters." (Lee, Comments, p.24) *"There is no evidence provided by Dr. Lee to show why there would be substantial leachate generation in year 31 while EPA's data shows rapidly declining leachate production with 8-10 years after capping when de minimus levels of leachate are generated. There is no evidence to support that RCRA caps have failed after 30 years either. Maintenance of the cap will ensure that perpetual care will not allow leachate to be generated at levels that are a risk to the environment."*

As discussed in my comments, the year 31 failure is an indication of the eventual failure of the liner system when there is inadequate postclosure funding to address the failure. Again as discussed above the 8-10 year statement does not apply to the infinite period of time that the wastes in the PDC landfill will be a threat to generate leachate when water passes through the plastic sheeting layer in the landfill cover.

With respect to, *"There is no evidence to support that RCRA caps have failed after 30 years either."* It is apparent that the Staff does not understand that RCRA caps have not

been in existence for 30 years, therefore how could a RCRA cap have failed in over 30 years.

The statement by the Staff, *“Maintenance of the cap will ensure that perpetual care will not allow leachate to be generated at levels that are a risk to the environment.”* is more of Staffs attempts to mislead the Board into believing the basic principles of chemistry and physics will not apply to the eventual failure of the PDC landfill thin plastic sheeting and compacted clay based containment systems. As discussed in my comments, who will be responsible for seeing that the necessary postclosure activities such as,

- “Monitoring the groundwater monitoring wells,
- Removing leachate from the leachate collection sumps,
- Repairing the cover when there is erosion of it, and the plastic sheeting liner in the cover when it deteriorates and thereby fails to prevent moisture from entering the landfill that generates leachate,
- Cleaning out the leachate collection system associated with plugging of this system,
- Monitoring the composition and magnitude of releases of gas from the landfill gas vents,
- Performing groundwater remediation when the pollution of groundwater by landfill leachate is discovered in a monitoring well or more likely in an offsite production well,
- Replacing the domestic water supply sources for nearby property owners/users when the groundwaters that they are using for domestic water supply are polluted by landfill leachate, and
- Funding the liability for lawsuits that will result from developing and permitting a landfill that will obviously pollute groundwater during the time that the wastes in the landfill will be a threat.

will be adequately implemented until the postclosure funding becomes exhausted? It is very unlikely that PDC will do this, will it be the responsibility of the County? What liability will the County assume in providing for postclosure care of the PDC landfill during the infinite postclosure period. These are issues that the Staff should have been discussing rather than promoting an expansion of the PDC landfill that will only make the total magnitude of the massive legacy that the PDC landfill will represent to the people in the Peoria area.

On page 15, the Staff quoted from my report and stated,

*“Dr. Daniel said (paraphrased) that of the studies he has seen, the antioxidants in the liner will degrade in 300 to 500 years, then the HDPE slowly starts to lose strength and deteriorate (Pg. 110. Feb 22 Transc.).”*

The Staff citing of Daniel statement without discussing the information on potential unreliability of this estimate is more of the biased presentation of information by the Staff. To only present the as support for PDC landfill expansion consultants for PDC without discussing the conclusions of others on the reliability of this estimated is biased presentation of information to the Board. As I discussed in my comments and in Flawed Technology, the 300 to 500 years service life of HDPE liners in a landfill is not based on

the work of Daniels but on the limited scope studies of Koerner. As discussed in Flawed Technology Koerner estimates are based on an extreme extrapolation of a few years of laboratory studies to hundreds of years in a landfill environment. As I indicated while neither Daniel or Koerner have expertise in physical chemistry, I have extensive formal education in this topic and taught environmental chemistry to graduate students for 30 years at several major universities. It is well known that the extrapolation of the limited scope studies on the degradation of HDPE by Koerner using the Arrhenius equation is highly speculative. As I have reported, at this time expected service life of HDPE plastic sheeting as a landfill liner is not known. What is known for certain is that the liner systems in the PDC hazardous waste landfill will eventually fail while the wastes in the landfill will still be a threat to generate leachate that can pollute groundwater with hazardous chemicals that are a threat to the health of those who use the groundwater as a domestic water supply.

With regard to the Staff's quoting from my report and statement, "Over time the integrity of the plastic sheeting liners will deteriorate to the point where they are no longer effective in preventing leachate from passing through them into the underlying groundwater system." (Lee, Comments, p.7) *Although the latest information by USEPA ("Assessment and Recommendations for Improvement for the Performance of Waste Containment Systems, USEPA, December 2002) shows that a HDPE liner could last up to 1000 years, the references by Dr. Lee cite conditions different from those presented at PDC landfill. The cases Dr. Lee cites for liner failure are mostly from solvents (of which are not at levels in leachate to cause a liner interaction) and oxidation, which his references state could happen in a lagoon exposed to air (the lagoon at PDC will be removed). Very little or no oxidation is expected to occur in buried liners (due to anaerobic conditions), and based upon the evidence in the record, there is no reason to expect interactions between leachate and the HDPE liners or the compacted clay which would cause more rapid degradation of the multiple, redundant liner system.*

This statement by the Staff demonstrates again the limited understanding of the chemistry, and physics of the PDC landfill system and its nearby groundwater hydrology. Contrary to the statement that my discussion of HDPE liner deterioration is due to **solvents**, my discussion of HDPE degradation is due to free radical attack. The statement by the Staff that the environment of the landfill is anaerobic is unreliable. The groundwater system of the area of the landfill is unsaturated and therefore contains air. If it were anaerobic as the Staff assert, the groundwater of the area would not be useable as a domestic water supply. The Staff have again in their attempt to justify supporting the expansion of this landfill have presented distorted information on my findings on the issue of HDPE and compacted clay liner failure.

On the top of page 15, the Staff stated, "He (Daniel) goes on to say the compacted clay will still be in tact and actually be less permeable due to the continued weight and compression. He believes that even if liquids go through the clay, the liquid will also "tend to drive the permeability down", making it more difficult to pass through.

The Staff in including the Daniel statement ignores the work that was reported in the Flawed Technology review where in 1984, the State of California adopted a clay liner as a landfill liner for MSW landfills. As reported California as part of its SWAT investigations of landfills conducted in the early 1990s found that the clay lined landfills were also polluting groundwaters as were the unlined landfills. Contrary to Daniels comments clay liners can allow rapid pollution of groundwater by landfill leachate.

On page 16, the Staff stated,

*“Staff tends to give more weight to Dr. Daniel’s testimony that HDPE liners will start weakening from 300 to 500 years in the future. At that point in time, leachate quantity and quality should be reduced to “de minimus” levels. There is a finite amount of pollutants that would leach from wastes within the landfill that at some future point in time, there would be no release of hazardous pollutants of any kind at this site. Also the perpetual care fund would manage the cap and ensure that leachate is no longer generated.*

The Staff have again demonstrated a lack of understanding of key issues. The Daniel 300 to 500 years is based on a highly speculative approach for estimating service life of HDPE plastic sheeting liners. Further the leachate generation rate in 300 to 500 years should the liners function this long would not be *de minimus*. Just the opposite will be the case, the postclosure funds will have been exhausted long before this time and it is highly likely that there will be no maintenance of the low permeability plastic sheet in the cover. The Staff needs to explain how the perpetual care fund that is only supposed to be available for 100 years is supposed to provide funds for postclosure care forever.

On page 16 the Staff quoted from my report and stated,

*"I concluded that HDPE-based plastic sheeting liners were the most stable and least likely to be affected by chemicals in municipal solid waste and hazardous waste." (Lee, Comments, p.22) Today’s liner formulations are much improved since Dr. Lee was involved in working for a liner company and are even more resistant to degradation.*

With this statement the Staff is trying to convince the Board that my work on landfill liner degradation stopped in the 1980s. Even a cursory review of my peer reviewed publications over the past 20 years shows that the Staff have presented a highly distorted assessment of my approach to providing reliable information to those interested in protecting groundwater quality from landfilled wastes for as long as the wastes in the landfill will be a threat.

On page 17, the Staff quoted from my report and stated,

*"The bottom line issue with respect to clay liners is that they are not impermeable, and that, in time, leachate can pass through them, leading to the pollution of groundwaters underlying the landfill." (Lee, Comments, p.23) The groundwater under the site may be subject to pollution only if there is sufficient quantity of leachate and high concentration of pollutants that can overcome the natural barriers to groundwater transport. PDC is constructed over a natural clay aquitard (that inhibits the flow of liquids) that protects the underlying aquifer. There are interactions in the compacted clay liner and clayey*

*natural till that will adsorb metals and organics, and diffuse leachate. Furthermore, if ever released, any contaminants in the leachate would be expected to further dilute and disperse once in the aquifer. The perpetual care fund will ensure that leachate is not of sufficient quantity to overcome the engineered and natural barriers that underlay PDC landfill.”*

This statement is more propaganda by the Staff in support of the expanded PDC landfill that presents a distorted picture of the course of events that will occur at the PDC landfill. There is no question that sufficient quantities of leachate will be produced in the PDC landfill that will penetrate the liner and eventually pollute the groundwaters underlying and near the landfill. The so-called natural clay aquitard will not prevent this pollution from occurring. The statements about the pollutants being adsorbed on the till applies to only some of the pollutants in the leachate. There are pollutants in the leachate that will not be adsorbed by the till. The perpetual care fund is grossly inadequate to provide the funds that will need to be devoted to adequate monitoring and maintenance and eventual groundwater system remediation that will occur at this landfill.

On page 18, the Staff quoted from my report and stated,  
"This (soil) complexity makes monitoring leakage through the landfill liner system difficult to conduct reliably." (Lee, Comments, p.12) *Staff believes this conclusion may conflict with Mr. Norris' testimony. If, as Mr. Norris claims, liquids percolate through the substrate underlying the site very quickly, any leakage would presumably migrate quickly into the groundwater and would be relatively easy to detect.”*

This statement is another reflection of the Staff's lack of understanding of key issues in polluted groundwater transport and its detection. There is no contradiction between Norris and myself. There can readily be rapid transport of leachate polluted groundwater that is not detected by the highly inadequate PDC groundwater monitoring system. As discussed in my comments and in the literature (see Flawed Technology for references) each monitoring well can capture (sample) only a short distance into the aquifer. With monitoring wells spaced hundreds of feet apart as occurs at the PDC site, leachate polluted groundwater can pass between the wells and not be seen by the monitoring wells.

Page 18, the Staff quoted from my report and stated,  
"PDC has not adequately characterized the underlying hydrogeology with respect to predicting when such pollution could be expected." (Lee, Comments, p.15) *Dr. Lee does not present any specific recommendations for what additional investigations are needed or criticism of the existing hydrogeologic work other than a general criticism.*

Again the Staff as part of its mission to support the development of the proposed landfill expansion asserts that a reviewer of a landfill expansion application must provide detailed comments on how to properly characterize a complex aquifer system. This is the responsibility of the landfill applicant not a reviewer.

Page 19 the Staff stated,

*“Furthermore, the perpetual care fund provides the community with the assurance that there will be an adequate monitoring program well into the future to determine if or when areas of the landfill, including inactive sections of the old landfill are causing any problems.”*

If it is the same County staff that will be responsible for developing an adequate monitoring program as the Staff that prepared the comments then there is great concern the County will in fact develop an adequate monitoring program. As discussed above the limited period of time that the perpetual care fund will have funds compared to the time that the wastes will be a threat makes any statement about how this fund will provide assurance that there will be adequate monitoring highly questionable.

Page 19, the Staff quoted from my report and stated,

*"It is my experience that landfills can pollute groundwaters several miles from the waste deposition area." (Lee, Comments, p.26) No specific case studies are cited or literature cited to show this, and there is certainly nothing in the record which would suggest that this landfill has that potential.*

On the contrary, my comments provided several references of instances where landfill leachate has polluted groundwaters at a distance of over a mile from the landfill. This can also occur at the PDC landfill.

Page 26, the Staff quoted from my report and stated,

*"The landfill is located too close to a major residential area. Dr. Fred Lee states that several miles of buffer lands should be located between such a landfill and adjacent property owners. (SC, p. 4) Neither Illinois nor federal regulations require such large buffer zones. The landfill is buffered by properties owned by PDC, and varies in length and width. The minimum distance from the landfill to the PDC property line is estimated at over 300 feet.*

The fact that neither the federal or state regulations require an adequate buffer lands between where wastes are deposited and adjacent properties does not mean that such distances are not needed to dissipate releases from the landfill on the landfill owner property. As discussed in the Flawed Technology review, failing to provide adequate buffer lands leads to justified NIMBY since landfills are well known to be adverse to adjacent and nearby property owners/users.

## **Overall**

Based on the Staff comments, the Peoria County Staff that prepared this Supplemental Report obviously had marching orders to do what is necessary to support the expansion of the PDC landfill. Those who made the decision to follow this approach are making a significant mistake that will do further damage to the health, groundwater resources and interests of the people in Peoria. This landfill should not be expanded but should be closed and PDC should be required to begin to establish a reliable program to adequately monitor the various landfill cells to detect initial pollution of groundwater. It is highly inappropriate to tie continued operation of this landfill to getting PDC to begin an

aggressive program of monitoring and remediation of the existing landfill. This can be accomplished with allowing continued operation of the landfill.