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April 28, 2008

Via Hand-Delivery

U.S. Environmental Protection Agency
Clerk of the Board
Environmental Appeals Board
1341 G. Street NW, Suite 600
Washington, D.C. 20005

In Re: Beeland Group, LLC, Beeland Disposal Well #1, UIC Permit Number MI-099-11-0001
UIC Appeals Nos. 08-01, 08-02, 08-03

Dear Clerk:

Enclosed please find Petitioners Star Township, Antrim County, and Friends of the Jordan River's Reply to Intervenor/Respondent Beeland Group LLC's Response to Petition No. 08-02 and Certificate of Service.

Thank you for your attention to this matter.

Very truly yours,

TOPP LAW PLC

Susan Hlywa Topp

SHT/mc
Enclosures
cc w/encl.: Stuart P. Hersch
Charles H. Koop
Roger W. Patrick
Susan E. Brice & Gregory L. Berlowitz
Joseph E. Quandt & Gina A. Gozzer
Allen & Trisha Feize

BEFORE THE ENVIRONMENTAL APPEALS BOARD UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, D.C.

In re:	)	
	)	
Beeland Group, LLC	)	UIC Appeal Nos. 08-01, 08-02, 08-03
	)	
UIC Permit No. MI-009-1I-0001	)	
	)	

PETITIONERS STAR TOWNSHIP, ANTRIM COUNTY, AND FRIENDS OF THE JORDAN RIVER'S REPLY TO INTERVENOR/RESPONDENT BEELAND GROUP LLC'S RESPONSE TO PETITION NO. 08-02

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Petitioners Star Township, Antrim County, and Friends of the Jordan River, by and through their attorneys, Susan Hlywa Topp of Topp Law PLC and Charles H. Koop, Prosecuting Attorney for Antrim County, replies to Intervenor/Respondent Beeland Group, LLC's ("Beeland") response to Petition 08-02. Respondent identifies that there appear to be two Petitions for Review filed by Friends of the Jordan River, Petition 08-02 and Petition 08-03. For clarification, Petition 08-02 is brought on behalf of Friends of the Jordan River Watershed, Inc. (a/k/a Friends of the Jordan River). It is our understanding that Petition 08-03 is brought by Dr. John Richter in his individual capacity.

ARGUMENT

Respondent alleges three general arguments against the Petition: (1) the Petitioners may not challenge deficiencies in a Permittee's application; (2) the petition fails to cite public comments made during the public comment period; and (3) the petition fails to identify the Region's erroneous findings of fact or conclusion of law, or alternatively identify a policy or exercise of discretion warranting review, in response to those comments. Respondent's objections to the Petition are not supported by either law or the record, therefore, Respondent's request for summary dismissal must be denied.

I. *Petitioner May Challenge Deficiencies in the Permittee's Application*

Respondent contends that the Board may not grant review of a challenge based on deficiencies in a Permittee's application. In support, Respondent cites *In Re Envotech, L.P.*, 6 E.A.D. 260,283-285 (EAB 1996). *Envotech,* however, supports Petitioners' position that an application may be challenged.

In *Envotech,* the petitioners claimed that the Region's geological assessment and maps attached to their application were inadequate. The EAB, rather than outright dismissing the claims, carefully considered whether the petitioners had submitted sufficient evidence to demonstrate that the Region's decision was clearly erroneous. Although the EAB concluded they had not, it also implicitly recognized such a claim could be reviewed, if the petitioners had presented proper support.

Hence, Respondent's assertion that the permit application is an improper basis for review is simply incorrect. Further, part of the EPA decision making process in issuing a UIC permit includes the EPA's review of the application itself.

Moreover, the Petition is not "solely" based on the Application for Permit, but on the Permit itself and the Response to Public Comment. Since the Permit was issued without supporting data in the application or the record to support the EPA's finding of fact, or conclusions of law, or response to public comment, as set forth in each of Petitioners enumerated arguments, the Permit is not protective of the drinking water.

Also, it's is apparent that Regional UIC personnel, i.e. the permit writer, does not understand the installation of the UIC well is part of an ongoing CERCLA removal action, that action is only partly underway, and final remedies for all areas under investigation have not been selected. Knowledge of the well's role in the CERCLA process likely would have impacted proposed permit conditions, including proposed term of permit and sampling requirements.

II. ***The Issues Identified in the Petition Were Raised During the Public Comment Period***

Respondents repeatedly argue that Petitioner has failed to cite specific comments for each issue in the Petition. Although the issues were raised in the public comment period, Petitioners

were not able to include all the citations to the public record in their Petition for the reason that the Administrative Record on file at the Library Repository and on the EPA website was incomplete. The Transcript of the Public Hearing and the Written Public Comments were excluded and only recently received by Petitioner through a Freedom of Information Request filed with the Michigan Department of Environmental Quality.

Petitioners have provided the reasons supporting review, demonstrated that the issues were raised during the public comment period, and that the Permit was based on erroneous findings or conclusions of law, or is an exercise of discretion or important policy consideration warranting review. Also, Petitioners have standing to challenge and may petition for review any condition of the final permit since they submitted comments on the draft permit. 40 C.F.R. § 124.19(a).

Numerous comments were submitted during the comment period which addressed the issues raised in the Petition. A number of comments addressed the lack of data concerning the Bell Shale as a confining layer, including but not limited to the following:

- Dick Steele, Star Township Supervisor: Migration concern due to the porous nature of limestone and that the shale is layered. *Transcript June 13, 2007 p* 18 ln 4-11

- Representative Kevin Elsenheimer: Raised the issue of lack of data on the geologic formation and the potential for the injectate to migrate upward into the water table. *Elsenheimer Letter to EPA dated June 20, 2007.*

- Heidi Lang: Groundwater from Alba flows into the Jordan River; contamination caused by increased pressures and the migration potential due to the porous nature of the geology. *Lang Letter to EPA dated July 2, 2007.*

- Dr. Patterson: Raised issues concerning the lack of data to support the conclusion that the Bell Shale will act as a confining layer. *Letters to EPA and MDEQ dated July 21, 2007 & July 27, 2007. Exhibits D & G to Petition;* attached as *Exhibit A.*

- Dr. Patterson: Raised issues concerning the lack of data on the characterization of the injection zone including the effective porosity and method of determination; vertical and horizontal permeability of the injection zone and the methods used to determine permeability; horizontal and vertical variations in permeability expected in the area of influence; the occurrence and extent o natural fractures and or solution features within the area of influence. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached as *Exhibit A.*

- Dr. James McClurg in his Letter to EPA attaching Antrim Shale Position Paper. *Exhibit H to Petition*

Other comments addressed the issues of whether there was sufficient data considered regarding the quality and effect of the injectate, existing reservoir conditions, as well as the lack of data regarding the injectate's environmental consequences and potential adverse effects. Issues identified in Section V.A.2 a-r of the Petition *(Petition, pp 12-13)* were all raised during the public comment period, including but not limited to the following:

- Dr. Patterson: Raised all the issues in her letters. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached as *Exhibit A.*

- Dr. Patterson raised issues concerning the lack of data on the characterization of the injection zone including the effective porosity and method of determination; vertical and horizontal permeability of the injection zone and the methods used to determine permeability; horizontal and vertical variations in

permeability expected in the area of influence; the occurrence and extent o natural fractures and or solution features within the area of influence. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached as *Exhibit A.*

- Dr. Patterson: Raised issues concerning the inadequacies of the critical pressure calculation and the use of single values for parameters whose values are unknown rather than assuming probable ranges for those values as well as other errors in the critical pressure calculation. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached as *Exhibit A.*

- Dr. Patterson: Raised issues concerning the lack of data pertaining to specific gravity of the injection-zone fluid and the pre-injection zone pressure at the base of the Dundee. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached hereto as *Exhibit A.*

- Dr. Patterson: Raised issues concerning the lack of data to support the conclusion that the injection well will have no cone of influence. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached as *Exhibit A.*

- Jennifer McKay: Raised the concern over the characteristics of the Injected Fluids. No true representative sample of what will be injected into the well unless EPA requires sufficient sampling prior to injection to insure waste is meets non hazardous criteria. *Tip of the Mitt Letter dated June 13, 2007.*

- Jennifer McKay: Raised concerns that the Grand Traverse Waste Treatment plant had to discontinue accepting the leachate because testing by the plant confirmed that the contaminants in the leachate were exceeding acceptable criteria.

Different cement kiln dust piles at Bay Harbor produce different leachate. *Tip of the Mitt Letter dated June 13, 2007.*

- Jennifer McKay: No true representative sample of what will be injected into the well unless EPA requires sufficient sampling prior to injection to insure waste is meets non hazardous criteria. *Tip of the Mitt Letter dated June 13, 2007.*

- Dr. Warren Wood: Accidents in unloading leachate at site or leakage of the injection well system can occur. The leachate is corrosive so special corrosion resistant material is needed for storage tanks and injection well piping. At least three groundwater monitoring wells should be required downstream of the injection site. Tracer tests should be run to check for vertical fractures. Mixing models should also be run to check for mineral precipitation when the native and waste fluids are mixed. Written comment submitted during public comment period, Attached as *Exhibit B.*

- Scott Brown, Star Township Treasurer: There is a concern about the differential in the formation pressures. *Transcript June 13, 2007 p* 16 ln 21-24.

- JoAnne Bier Beeman Letter to EPA. *(Included in Exhibit D to Petition)*

- Star Township's Written Comments. *Letter from Susan Topp to EPA dated July 23, 2007. (Exhibit B to Petition)*

Comments were also submitted identifying the issues pertaining to classification and characterization of the waste and effects, including by not limited to the following:

- Dr. Patterson. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached hereto as *Exhibit A.*

- County Commissioner Chris Christensen: Heavy metals and alkalis left in the leachate. *Transcript June 13, 2007 p* 20 lines 12-18.

- Jennifer McKay, Tip of the Mitt Watershed Council: Malfunction concerns as the leachate comes from CERCLA site and is a hazardous substance. *Transcript June 13, 2007,* p 22, ln 17-25

- Jennifer McKay, Tip of the Mitt Watershed Council: Untreated leachate exhibits characteristic of corrosivity and would be hazardous waste under RCRA. *Transcript June 13, 2007,* p 23, ln 1-12

- Jennifer McKay, Tip of the Mitt Watershed Council: Well constructed only for non hazardous waste and injection of untreated leachate could result in malfunctions and cause significant groundwater contamination. *Transcript June 13, 2007,* p 23, ln 13-17

- Jennifer McKay, Tip of the Mitt Watershed Council: Untreated leachate will cause scaling and corrosion causing potential groundwater contamination.. *Transcript June 13, 2007,* p 23, ln 18-25

- Jennifer McKay, Tip of the Mitt Watershed Council: Each cement kiln dust pile possesses unique characteristics and the permit application is based upon minimal samples. *Transcript June 13, 2007,* p 24, ln 3-9

- Peter Vellenga: High levels of metals and mercury present in the leachate, up to 230 times the surface water quality limits. *Transcript June 13, 2007,* p 55, ln 15-22

- Representative Kevin Elsenheimer: Raised the issue of "non- hazardous" classification of "hazardous" waste. *Elsenheimer Letter to EPA dated June 20, 2007.*

- Dr. Patterson: Raised issues concerning the allowance of injecting treated and untreated waste. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached hereto as *Exhibit A.*

- Dr. Patterson: Raised issues pertaining to the failure to address how contaminants migrating to the USDW will be remediated or how consumers of the water will be protected. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached hereto as *Exhibit A.*

- Dr. Patterson: Raised issues identifying the failure to require monitoring for lead in the injection fluid composition even though lead has been identified in the leachate. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached hereto as *Exhibit A.*

- JoAnne Bier Beeman Letter to EPA. *(Included in Exhibit D to Petition)*

- Star Township's Written Comments. *Letter from Susan Topp to EPA dated July 23, 2007. (Exhibit B to Petition)*

Also, comments were raised regarding low-income demographic of the area.

- Cindy Pointe: environmental justice and income disparity between Bay Harbor and Alba. *Transcript June 13, 2007,* p 34, ln 2-18.

- Dr. Patterson in her written comments to the EPA. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached hereto as *Exhibit A.*

- Star Townships Written Comments. *Letter from Susan Topp to EPA dated July 23, 2007. (Exhibit B to Petition)*

The remaining issues identified on the Petition were also raised in the public comment

period, including NEPA, uniqueness of aquifer, and prudent alternatives, including but not limited to the following:

- Keith Martell: Need for environmental assessment under NEPA. *Transcript June 13, 2007,* p 57, ln 17-23
- Keith Martell: Must determine the direction of groundwater flow. *Transcript June 13, 2007,* p 57, ln 24-25
- Keith Martell: Transfer of water from one watershed to another. *Transcript June 13, 2007,* p 58, ln 12-15
- Keith Martell: On site treatment prudent and feasible alternative. *Transcript June 13, 2007,* p 58, ln 16-19
- John Richter: Jordan River designated as a Wild and Scenic River under the Natural Rivers Act and is downstream of the injection site. *Transcript June 13, 2007,* p 59, ln 15-24
- John Richter: Aquifer is unique and is the headwaters of eight rivers that are groundwater driven. *Transcript June 13, 2007,* p 60, ln 3-14.
- Peter Garwood: prudent and reasonable alternatives to the permit. *Transcript June 13, 2007,* p 26, ln 1-10
- Dorothy Francis: prudent and feasible alternative is on site treatment. *Transcript June 13, 2007,* p 28-29
- David Howelman, Antrim County Commissioner: The injection site is a regional recharge area for drinking water. *Transcript June 13, 2007 p* 16 ln 9.
- Scott Brown, Star Township Treasurer: There is a concern about other wells penetrating the area. *Transcript June 13, 2007 p* 16 ln 12-20.

- Star Township's Written Comments. *Letter from Susan Topp to EPA dated July 23, 2007.*

- Dr. Patterson in her written comments to the EPA. *Letters to EPA and MDEQ dated July 21, 2007 and July 27, 2007. Exhibits D and G to Petition;* attached hereto as *Exhibit A.*

- Resolution of the Antrim County Board dated June 14, 2007. *Exhibit C to Petition*

Moreover, the EPA and DEQ were very aware that formations suitable for a UIC exist much closer to Bay Harbor than what Beeland was presenting and that the Alba injection well was not included in the Feasibility Study. *Email correspondence between EPA and DEQ dated September 7, 2007, attached as Exhibit C.* Thus, it is clear that the issues addressed in the Petition were properly preserved during the public comment period.

Additionally, the EPA failed to provide any response at all to a number of the above comments. For instance, nothing addressed Dr. Patterson's comments regarding the lack of data on the Bell Shale's integrity at this location and the characteristics of the sample injectate. The failure of the Region to address these issues in its response justifies a review on the merits.

III. *The Petition Identifies the EPA's Erroneous Findings of Fact and Conclusions of Law, or, Alternatively, Policies Warranting Review*

Petitioners have demonstrated either an erroneous finding of fact or conclusion of law, or alternatively a policy warranting review, for each issue raised in the Petition. The EPA's Response to Comments and determination are erroneous because they are made despite the fact that requisite data is lacking.

Where the EPA's explanation for a permit decision lacks sufficient support in the administrative record, or where the EPA provides only a cursory explanation for a decision that

is not supported by a detailed explanation or clear rational, the EAB will grant review and then remand the permit decision back to the EPA. *In re Beckman Prof. Servs.*, 8 E.A.D. 302, 311 (EAB 1999). EPA's overriding duty under the UIC provisions of the SDWA is to "assure that underground sources of drinking water will not be endangered by any underground injection" *42 USC § 300h.* Endangerment includes a situation in which injection may otherwise adversely affect the public health. *Id.* Allowing the potential for contamination in the accessible environment in amounts that exceed the burdens established by the SDWA is an arbitrary and capricious action by the EPA. *NRDC v EPA, 824 F2d 1258 (1st Cir. 1987)*

1. *Insufficient Data Demonstrating the Bell Shale Will Act as a Confining Layer*

Respondents first attack Petitioner's observation that the EPA made no determination that the Belle Shale was an impermeable confining zone. Respondents' argument is essentially that this case is perfectly analogous to the facts in *Envotech.* However, the petitioners in *Envotech* challenged that the EPA's data was *inadequate* because it was inaccurate. Here, Petitioners challenge the data's *sufficiency* because no evidence was presented to support the Permittee's claim that the Bell Shale will act as a confining layer. Likewise in *In Re: American Soda, LLP,* 9 E.A.D. 280, 296 (EAB 2000), the EAB found that the Region had satisfied the regulation's requirements where it considered the data in the application, the regional data known at the time of the permit application and comments submitted to the Region. In the present case, the EPA considered known regional data and some public comments, but failed to consider any data on whether the Bell Shale at the drilling location would act as a confining layer. To find that the Bell Shale would act as a confining layer was therefore an erroneous factual finding.

This is especially true in light of the EPA's recognition that "contaminants could migrate to the USDW . . . by a pathway connected directly to the injection zone," EPA Response to

Comments, *Geology/Watershed and other technical issues,* Response to Comment 37 at 35-36, and further recognized that *some* contaminates would: "Geological records demonstrate that there are confining layers between these two strata which would prevent significant migration of contaminants from the injection zone to the USDW." *Id.* (emphasis added). No data were presented, however, which lead the EPA to believe the Bell Shale would act as a "confining layer" and would prevent "significant" migration.

In contrast, Petitioners have submitted data addressing the porous and permeable limestone layers in the Bell Shale, the fractures (as opposed to faults) as contained in *Fractured Reservoirs in Carbonate Rocks: The Michigan Basin* by Barnes and Harrison, and the stability of the potentially "brittle" nature of the shale. These are not mere "differences of opinion" or "alternative theories" as Respondent contends; rather, it is the only data on whether the Bell Shale in the drilling area will act as a confining layer. To hold otherwise with no supporting data is unsupported and clearly erroneous.

Further, the technical arguments outlined in the Petition are valid. Petitioner set forth at least ten different Responses to Comments by the EPA that assumed the Dundee Formation/Bell Shale was in fact a confining layer. *Petition, p 9-11.* Since there is no evidence or data to support this assumption, these Responses are erroneous as a result. Petitioner specifically stated why the EPA's Response to the enumerated Comments was erroneous on those issues and to further identify and support the erroneous nature of the Response to Comments, attached Affidavits of Dr. Timm and Dr. McClurg. *Exhibits I and J to Petition.*

EPA states that "Shales have very low permeability and prevent vertical migration of fluid." *EPA Response to Comment, Geology Watershed and Other Technical Issues, Response 36, p 35.* That is **absolutely not true for all shales.** A simple and local case in point is the Antrim Shale above the Dundee. It is highly fractured, porous, and permeable allowing for the

migration of gas and groundwater as is evidenced by the numerous gas well within it. EPA contradicts itself when it then states that "the geology of Michigan is relatively consistent and there should be no significant change in the geology between the injection well and the nearby data wells". *EPA Response to Comment, Geology Watershed and Other Technical Issues, Response 37, p 35.* That statement by itself would mean that the Bell Shale **should be** fractured, porous and permeable as well.

EPA also concludes for a fracture to allow injectate migration, the fracture would have to be 1,250 feet long. *EPA Response to Comment, Geology Watershed and Other Technical Issues, Response 22, p 32 and Background Section at 2.* This is clearly erroneous as no fracture needs to be 1,250 feet long. Any fractured rock is a series of short interconnecting fractures. The record is lacking any evidence that the Bell Shale is an impermeable confining zone.

The Responses to Comments from EPA did not address specific studies and/or monitoring that address the concerns about increased fracturing caused by gas extraction wells and how that might increase waste mobility. Respondent Beeland's argument that Petitioner did not preserve this issue for appeal *(Beeland's Response Brief, p 16)* through the comment "Have geophysical surveys thoroughly ascertained the absence of permeable fracture in the Bell Shale above the injection layer?" does not consider the fact EPA is required to address all pertinent concerns raised during the public comment period, regardless of how the concern or question is worded. Moreover, if the UIC permitting process is truly the functional equivalent of NEPA, that question plus many others, should have been addressed more thoroughly in EPA's response to comments.

Cumulative impacts of decisions/actions are required to be assessed under NEPA (and CERCLA). There are numerous gas extraction and brine injection wells in Antrim County. The questions pertaining to thoroughness of information on the geologic formations are valid

questions from the stand point of "cumulative impacts". Fate and transport of chemicals is a greater unknown in subsurface conditions; this has always been the case and something EPA is aware of. The Reduction of Toxicity, Mobility and Volume through Treatment is one of the nine criteria that must be considered pursuant to the NCP. Underground injection of liquid waste does not satisfy this requirement, even if neutralization of the pH reduces toxicity. Mobility likely will not be reduced if there are significant fractures present in the injection zone and the volume is not decreased. The EPA has also failed to consider long-term effectiveness/ permanence and short-term impacts, which are also part of the nine NCP evaluation criteria.

The preceding, in addition to that set forth in the *Petition,* makes it clear that the following EPA Responses Comments are clearly erroneous:

- *Background Section, p 2;*
- *Issues Related to Bay Harbor, Comment 1, p7*
- *Monitoring and Legal Issues, Comments 8, pp17-18, Comment 15, p19, Comment 18, p20, 25, p22, Comment 31, pp23-24; Comment 38 p26;*
- *Geology/Watershed Issues, Comments 5, 6, 11, 15, 19, 21, 22, 35, 36, 39, and 41.*

2. *Insufficient Data on the Quality, Characterization, and Adverse Effects of the Injectate*

Petitioners set forth eighteen different areas where the data was lacking and the EPA's Responses to Comments was erroneous as a result. *Petition, p 11-12.* Petitioner also set forth the lack of analysis on the effect of the other constituents in the leachate and the failure to properly characterize the waste as hazardous. *Petition, p 15-16.* Petitioner specifically stated why the EPA's Response to Comments was erroneous on those issues and to further identify and support the erroneous nature of the Response to Comments, attached Affidavits of Dr. Timm and

Dr. McClurg. *Exhibits I and J to Petition.* Additionally, the Permit also fails to require sampling of all the necessary constituents and the Permit condition requiring periodic monitoring should be more frequent. Weekly monitoring of injectate for the known constituents in the leachate and quarterly monitoring for the constituents on the priority pollutant list should be required, and possibly even more. Further, four samples of leachate collected during a three-month period are not necessarily representative of long-term leachate characteristics.

The proposed UIC well is part of a CERCLA Removal Action and not a separate/independent permitting activity. As stated previously, Regional UIC personnel do not associate the installation of the UIC well as part of an ongoing CERCLA removal action, that that action is only partly underway, and final remedies for all areas under investigation have not been selected. Knowledge of the well's role in the CERCLA process likely would have impacted proposed permit conditions, including proposed term of permit, monitoring and sampling requirements.

The fact that the composition of the leachate changes from CKD pile to CKD pile for the four piles was identified during the public comment period, yet only four non-representative samples taken over a three month period were used as a basis to characterize the waste stream. Further, although an FS with associated recommended alternatives has been prepared only for the East Park CKD pile, it appears the pursuit of a UIC well with a 10-year operating life precedes a future decision to dispose of leachate from all four CKD piles via underground injection. The CKD piles at the Bay Harbor site were covered with a permeable layer of soil then topped by a golf course. Herbicides, pesticides, and other chemicals typically associated with maintaining the appearance of a golf course are likely being introduced into the leachate mixture. All corresponding constituents on the priority pollutants list should be monitored for in addition to the heavy metals.

During forums held during the CERCLA process, commentors noted disposal of waste materials other than CKD at the Bay Harbor site during its days as a closed cement plant. As remedial activities proceed, these other wastes could be disturbed and release additional constituents into the leachate. This warrants more comprehensive and frequent sampling and monitoring than proposed in the UIC Permit. Currently, both surface water and groundwater come into contact with the CKD piles. The leachate collection system at Bay Harbor is not designed to collect all leachate generated. It is likely the volume of groundwater and surface water is diluting the leachate generated by water moving through the CKD pile. Should conditions change that result in a lower water table, e.g. drought conditions, groundwater extraction wells as part of a remedy or landscape irrigation, the concentration of constituents in the leachate could increase significantly. Again, this warrants more comprehensive and frequent sampling and monitoring than required in the UIC Permit.

Further, with respect to the corrosivity issue, both EPA and Beeland assume a substance is only corrosive if it is "corrosive" pursuant to RCRA definition of hazardous waste. A substance can be corrosive in terms of its ability to damage other material, without exhibiting the RCRA defined characteristic of corrosivity. Many concerns about the effect of the corrosivity of the waste stream on the injection well and formation were identified during the comment period. As stated previously, there is a lack of data on this issue.

The preceding, in addition to that set forth in the *Petition,* makes it clear that the following EPA Responses Comments are clearly erroneous:

- *Background Section, p 2;*
- *Issues Related to Bay Harbor, Comment 1, p7*
- *Monitoring and Legal Issues, Comments 8, pp17-18, Comment 15, p19, Comment 18, p20, 25, p22, Comment 31, pp23-24; Comment 38 p26;*

- *Geology/Watershed Issues, Comments 5, 6, 11, 15, 19, 21, 22, 35, 36, 39, and 41.*

3. Insufficient Data Regarding Environmental Consequences and Adverse Effects

Respondents then misstate Petitioner's position regarding NEPA. Unlike the petitioners in *In Re: American Soda, LLP*, 9 E.A.D. at 291, Petitioner does not allege that the Region should have prepared an environmental impact statement. Rather, Petitioner recognizes that the SDWA permitting process requires an analysis of the environmental consequences of the proposed permit action to satisfy NEPA's environmental consideration requirements. However, if the SDWA's permitting process is not properly followed, it follows that both the SDWA and NEPA are violated.

The EPA listed a number of areas where an applicant must provide sufficient data to demonstrate that the environment will be protected. These included "geological considerations used in the well siting and design, especially information on all USDWs penetrated by the injection well" and "the structural integrity of the well." EPA Response to Comments, *Monitoring and legal issues,* Response to Comment 31 at 23-24. The EPA then concluded that a "technical review" of the application indicated that all EPA requirements were met. But no data was submitted regarding the ability of the Bell Shale to act as a confining layer, the impact of the injectate on the formation and existing reservoir conditions. Additionally, the data submitted on the injection pressure curve and cone of influence is erroneous. Petitioners are not merely "repeating objections made during the comment period," as Respondent contends, but are instead demonstrating that the EPA's "technical review" was clearly erroneous because it was not derived from any factual basis. A decision derived from a "technical review" of no data clearly warrants review.

Further, the proposed UIC well is part of a CERCLA Removal Action and not a separate/independent permitting activity. As stated previously, Regional UIC personnel do not associate the installation of the UIC well with the ongoing CERCLA removal action, which is only partly underway; and final remedies for all areas under investigation have not been selected. Knowledge of the well's role in the CERCLA process likely would have impacted proposed permit conditions, including proposed term of permit and sampling requirements.

EPA refused to respond to comments on the draft UIC permit for a number of concerns raised by stating those issues fell outside the jurisdiction of the UIC program. However, those concerns are not outside of the CERCLA decision process, which is more closely the functional equivalent of NEPA than the SDWA/UIC permitting process. In addition, the EPA Response to Comments quoted by Respondent Beeland on pages 24 and 25 of their Response clearly demonstrates the UIC process is not equivalent to NEPA, which has a much broader scope of items considered, including transportation issues, waste storage prior to injection, noise, dust, air quality, etc. EPA's failure to understand these issues lead them to erroneous and incomplete decisions and responses.

4. *Improper Evaluation of Low-Income Demographics*

With regard to environmental justice considerations under Executive Order 12898, Respondent correctly states that the EPA may conduct a disparate impacts analysis pursuant to its UIC regulatory "omnibus authority" under 40 C.F.R § 14.52(a)(9). The court in *Envotech,* made clear that "when a commenter submits at least a superficially plausible claim that a proposed underground injection well will disproportionally impact the drinking water of a minority or low-income segment of the community in which the well is located, the Region should, as a matter of policy, exercise its discretion under 40 C.F.R § 14.52(a)(9) to include

within its assessment of the proposed well an analysis focusing particularly on the minority or low-income community whose drinking water is alleged to be threatened." *Envotech,* 6 E.A.D. at 282 (emphasis added).

A proper evaluation under *Envotech* would have been in terms of the community's low-income demographics. The EPA's screening evaluation broadly reviewed the community in terms of factors where no plausible claim existed. The resulting conclusion was not relative to the community's low-income population, but diluted with other irrelevant demographics. This was an erroneous conclusion of law, resulting in an erroneous factual finding. Both warrant review by this board.

Further, CERCLA regulations provide some flexibility for onsite disposal/management of remediation waste, particularly for removal actions. (Although the substantive requirements of applicable permitting regulations must be met, EPA has consistently taken the position that the acquisition of permits is not required for onsite remedial actions. *USEPA OSWER Directive 9355.7-03,* dated February 19, 1992) As stated previously, the fact that locations near or in Bay Harbor were available was known to EPA. *See Exhibit C, attached.* Yet Respondent Beeland (a subsidiary of Consumers Energy) chose to pursue off-site management of waste by trucking and injecting the leachate underground. It must be considered whether the well location was selected based on economic demographics. It is likely the affluent Bay Harbor community would loudly and effectively oppose an onsite UIC well or an onsite water treatment plant.

5. Failure to Provide the Public with All Relevant Information

Petitioners have had great difficulty in obtaining the complete administrative record for the UIC permit. The Administrative Record on file at the Library Repository and on the EPA website is incomplete. The Transcript of the Public Hearing and the Written Public Comments

were excluded and only recently received by Petitioner through a Freedom of Information Request filed with the Michigan Department of Environmental Quality. All relevant information would include information regarding the UIC well's relationship to the remedy for the Bay Harbor site, and even components of the Bay Harbor site's Administrative Record.

IV. *The Proposed UIC well is Part of a CERCLA Removal Action and Not a Seperate/Independant Permitting Activity*

It is important to understand that the proposed UIC well is part of a CERCLA Removal action and not a separate/independent permitting activity. EPA and MDEQ responses to comments on the draft UIC permit refuse to address a number of concerns raised by stating those issues are outside the jurisdiction of the UIC program. However, those concerns are not outside of the CERCLA decision process, which is more closely the functional equivalent of NEPA than the SDWA/UIC permitting process. Again, this is evidenced by EPA/MDEQ responses to issues that clearly would be addressed under NEPA (or CERCLA), but were deemed to be outside the scope of the UIC program.

Further, removal actions must be consistent with the final remedial action at a site. Historically, removal actions often become part of a final remedial action. The Bay Harbor site has 4 areas of disposed CKD that are to be addressed under the CERCLA process. The Beeland request for a UIC permit with a 10 year effective life suggests underground injection of wastes is to become part of the final remedy for those areas. However, based on the available administrative record, a Remedial Investigation/Feasibility Study (RI/FS) has been prepared for only 1 of those 4 areas. There does not appear to have been a formal decision made on the recommendations in that FS, nor is there a clear schedule for RI/FS preparation for the remaining 3 areas. *(See Exhibit C, Email between EPA and DEQ)* Therefore, it is premature to determine underground injection of leachate is consistent with final remedial actions.

The EPA's issuance of the Permit was based on erroneous findings of fact and conclusions of law, and demonstrates that the Permit was the result of inappropriate exercise of the EPA's discretion. Further, the Permit and Petition raise important policy considerations which the EAB should, in its discretion, review. Therefore, Respondents request for summary disposition must be denied and the Petition for Review granted.

Respectively submitted,

Topp Law, PLC

Susan Hlywa Topp (P46230)
Attorney for Petitioners, Star Twp.,
Antrim Co. & Friends of the Jordan

Dated: April 28, 2008

2386 Sumatran Way #50
Clearwater, FL 33763
July 21, 2007

William J. L. Bates, Mail Code: WU-16J
Environmental Scientist
US EPA, Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

RE: Beeland Injection Well Permit #MI-009-1I-0001

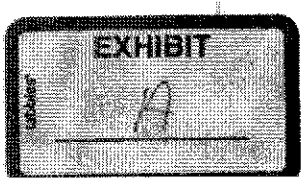
Dear Dr. Bates:

My 27 year old niece, Tara McGraw, lives about 3 miles from the proposed Beeland injection-well site. She lives with her husband, Jim, and their two small children, a five-year-old daughter, Sara, and a four year old son, JT. They do not have much money at this stage of their lives.

They purchased their Alba/Elmira home in July 2006 at 7255 Alba Highway (in Section 20, T30N, R5W--Section 14 is the proposed siting of the Beeland well). They had looked at homes in Kalkasaa, closer to where Jim works, but did not buy there because they were concerned about the water quality. They thought the water would be better in Alba/Elmira. They are not "on the internet," and they did not know about the proposed injection well when they purchased their home, but had they known, they would not have purchased it.

I am familiar with the problem of environmental justice, where wastes tend to be disposed of among poor populations. I am concerned that the location of the Beeland well appears to be an example of that problem. The waste to be transported to and injected into the Beeland well originates from an area of more affluent population, Bay Harbor, about 30 miles away. Relocation of the waste to Tara's neighborhood will increase health risks to Tara's family and to her neighbors and their unborn children through increased air pollution, increased risk of trucking accidents, and increased risks of contamination of their water supply.

Tara's family gets all their water from a well on their property. Their drinking-water aquifer is not protected from ground spills by a low permeability cover. Whatever spills on the ground will eventually migrate into the aquifer. Spills onto the ground surface are likely from trucking accidents, truck leaks, and sloppy unloading of contaminated fluid from the trucks at the injection well site. Horizontal migration of contamination within the aquifer is not restricted by any significant low permeability deposits. Additional to those from the surface, potential contamination sources include the injection well itself and the network of other wells injecting into the same geological strata and penetrating through the aquifer.



It would seem to me safer to dispose of the contamination at its site of origin/generation, Bay Harbor, where the population is more affluent and less vulnerable to injury from contaminated water. Bay Harbor residents are better able to afford water filtration systems and bottled water to protect their children than are the people of Alba or Elmira. Moreover with local disposal, air pollution from the truck transport would be eliminated completely, removing an unnecessary source of atmospheric pollution, and trucking accident risks also would not be an issue.

Trucks transporting the contamination from Bay Harbor to the proposed injection well site will be driving down Alba Highway right past my niece's home. It is my understanding they will be transporting as much as 100,000 gallons per day of contaminated water. My niece's yard is not fenced, and she cannot afford to install a fence. And there is a school bus stop on Alba Highway right in front of her home. This increase in truck traffic will increase the risk of a child's or schoolbus' being struck by a truck or even a truck's sliding on winter ice into Tara's house. And I assume that the trucks transporting the contamination will be releasing diesel exhaust, a known carcinogen and multiple system toxin, into the air Tara and her family breathes.

If the waste water to be injected is truly "non-hazardous," why is it not dumped into Lake Michigan? But if the waste water is too "hazardous" for that, let the owner of the pollution source, CMS, pay the extra money to make it suitable for dumping directly into Lake Michigan. Or let CMS drill an injection well at the pollution site. Why should the people of Tara's neighborhood be forced against their wills, without any compensation, to bear the increased risk of harm to save CMS money? And even perfect justice could not assign a dollar value equivalent to any harm Tara's children might suffer from CMS's Beeland injection well. Hence there is no acceptable compensation.

Dr. Bates, you have been quoted as having said at the June 14th public meeting on the proposed well that in Antrim County there are over 200 injection wells, all approximately 2,000 feet deep. And the EPA website on the Beeland injection well dated May 2007 states, "About 200 wells are currently permitted in Antrim County to inject into this same geologic layer." The EPA website (http://www. epa.gov/safewater/uic/classi.html) reports that in the entire USA there are 366 Class 1 non-hazardous and 163 Class 1 hazardous injection wells. Does Antrim County now contain more than a third of the USA's Class 1 injection wells? The people of Antrim County need to know why the density of injection wells in their county is so high. Is Antrim County serving as a dumping ground for contaminants being trucked in from other more affluent areas across the USA for injection-well disposal under Antrim's drinking-water aquifer?

In view of the extraordinarily high density of injection wells penetrating their drinking water aquifer, what epidemiology studies of the Antrim County population have been done or are now being funded for health effects on the Antrim people, including birth defects?
Why are contaminate injection wells not placed in areas where the population is not dependent on home well water for drinking? Why not locate injection wells in neighborhoods where the drinking water is processed, monitored, and piped into the

homes, rather than where people are dependent on individual wells, not legally protected by the requirements of drinking-water monitoring?

Although they would have attended and have many unanswered questions (as stated in this letter), Tara and Jim were not notified of or aware in advance of the meeting at the Alba School Gym that took place on June 14th concerning the injection well. They learned of the meeting from the TV news after the meeting was over. Their neighbors also were not notified. The few neighbors who attended happened to hear of the meeting by word of mouth. It appears that many interested families in the neighborhood of the injection-well site were not informed of the date and time of the meeting.

Sara attended kindergarten at the Alba School until May 29th. In addition to the token "public" notice in the newspaper that apparently few people would see, why were not notices of the meeting sent home with the children attending the Alba School? That would have been an effective way to notify those most likely to be interested--those with children who are the most vulnerable to pollution damage.

How can Sara and JT be protected from drinking contaminated water in the event of a know contamination incident? Can we assume Tara's family will be informed of the incident by a notification process no more effective than that used to notify them of the June 14th meeting?

Moreover, the EPA website with item, "EPA, MDEQ to hold public meeting and hearing on proposed disposal well," with release date of 6/05/2007, gives incorrect notice of the meeting as June 13th. The meeting actually took place on June 14th.

There should be another public meeting of which the entire population is properly and actually notified. That meeting should be scheduled for a time/date when working people can attend. The meeting place should contain adequate seating for a very large audience as at the June 14th meeting many people (who had already worked for eight hours that Thursday) were not provided seats and had to stand for the entire three hour meeting.

Since approximately 200 injection wells are already injecting into the same strata as the proposed well and since numerous gas wells also penetrate the drinking-water aquifer, the proposed well will increase the risk of injection fluid's entering that aquifer via failure in any of those other wells. Additional injection into the same strata will increase fluid pressure, chances of fracture, and chances of upward migration through new fractures, through existing wells, and through existing fracture zones. Moreover, physically this complex system constitutes a nonlinear dynamical system, where small changes in boundary conditions can cause chaotic results. Adding just one more injection well could significantly alter the stability of the system, leading to contamination of the drinking-water aquifer.

What numerical modeling of fluid flow and fracture migration has been done to gain

insight into this system?

Have geophysical surveys thoroughly ascertained the absence of permeable fractures in the Bell Shale above the injection layer?

What are the chances that leakage is now taking place and migrating into the drinking water aquifer and not being detected?

Are the effects of existing wells being monitored effectively?

Are well owners trusted to monitor their own wells? If CMS allowed release of high pH leachate to enter Lake Michigan for several months in 2004, how can we be assured CMS will not allow similar such problems with the proposed injection well?

How is the drinking water aquifer being monitored for contamination?

What can be done to correct a contamination problem after it has occurred and been detected? And what would be done, and who would pay for it?

Does the EPA have enough money to monitor for environmental violations or to enforce permit requirements?

How will the EPA prevent hazardous fluids from been injected into the "non-hazardous" Beeland well?

Will Beeland or CMS suffer no more than a "slap on the wrist" if found in violation of their permit, and will operating in violation of their permit actually be more cost effective to them than complying?

Did Beeland choose their well site based on its own economic interests (including potential litigation) at the expense of the present and future residents of Antrim County? Public disclosure of all financial matters relative to this well should be required.

Is or was CMS a member of the Chemical Manufacturers Association, which exerted significant effects on the regulations for injection wells to the benefit of the injectors and to the detriment of populations at risk from the injection wells?

What environmental impact studies have been done for Antrim County?

On page 34 of EPA document, "Class 1 Underground Injection Control Program: Study of the Risks Associated with Class 1 Underground Injection Wells," the following statement appears:

"Pumping in an overlying aquifer with failure pathways increases the amount of waste escaping from the injection zone. (It should be noted that, if a USDW were directly over a proposed injection zone, Class I regulations would not allow the well to be

constructed; this makes the addition of the pumping scenario to the model overly conservative.)" [underlining added for emphasis]

Since Tara's neighborhood's USDW (underground source of drinking water) is directly over the proposed injection zone for the Beeland well, why would construction of the Beeland well be allowed or even considered?

I have attached 21 additional comments directed specifically to permit #MI-009-1I-0001.

The health and brains of the children are our greatest economic resource. Protecting them from damage should be our top priority. I have done research in computational modeling of the fluid dynamics of porous media, and I have worked as an exploration geophysicist for Exxon. I know many important questions about the safety of the Beeland well and others cannot be answered to my satisfaction and that the safety of the system cannot be predicted. Denying Beeland this permit would be one step toward protecting the children.

Sincerely,

Patricia Patterson, Ph.D., Geophysics
727 799 5423

Attachment (3 pages):
ADDITIONAL COMMENTS ON PROPOSED UNDERGROUND INJECTION WELL PERMIT MI-009-1I-0001

ADDITIONAL COMMENTS ON PROPOSED UNDERGROUND INJECTION WELL PERMIT MI-009-1I-0001

The permit states as its purpose, to protect the quality of underground sources of drinking water (USDW), but the following provisions or lack of provisions in the permit do not offer protection to the present and future population who rely on private wells in the vicinity of the proposed well for their household drinking water:

1. The permit is supposedly for disposal of non-hazardous waste but it allows for both treated and untreated groundwater and surface waters from the Bay Harbor, Michigan Remediation Project to be injected.

2. The permit states that there are 3 injection and 1 plugged and abandoned wells within 2 miles of the proposed well site. Monitoring requirements of the permit say

nothing about checking the abandoned well for back up into it or monitoring of that well as potential source/route of contamination to the underground sources of drinking water

3. Why is the region of review only within 2 miles of the proposed well site?

4. The permit does not limit the amount of fluid to be transported to the well site or injected into the well. Will there be on site storage if more waste is transported to the well site than can be injected within the pressure constraints? Has Beeland applied for any additional permits related to this injection well?

5. The permit requires that if upward migration of fluids through the confining zone of the well is discovered within the two mile area of review and this migration of fluids causes introduction of any contaminant into an underground source of drinking water, Beeland must immediately cease injection until the situation has been corrected. But the permit does not say how contaminants in the USDW will be corrected or how potentially affected people will be contacted or protected.

6. The permit does not specify any monitoring of the USDW in the vicinity of the well as a reasonable means of detecting contaminants from the injection well.

7. The permit does not specify any requirement of monitoring the wells of the residents living around the injection well. Damage to people, especially children, pregnant women, the ill and elderly, caused by drinking contaminated water is not correctable.

8. The permit states that Beeland has a duty to comply with regulations and to provide information to the EPA, but the permit also states that noncompliance can be allowed by an emergency permit.

9. The permit does not require Beeland to provide any information on the well to the residents living around the injection well, and the permit states that information Beeland submits to the EPA may be claimed as confidential and hence not available to the public. All information should be available to the public.

10. Beeland's duty to mitigate is stated in vague terms that do not protect the population from harm from the well.

11. Beeland's monitoring records need only be retained for 3 years. This is not reasonable for time scales for migration of fluids. Monitoring records should be kept indefinitely for future scientific purposes and modeling. Monitoring records also should be available for the protection of future residents of the area. Surely a record of the history of injection of contaminants into the subsurface strata is something the present and future residents need to know. Among other possible events, future catastrophes could alter substantially the underground fluid dynamic transport processes.

12. Beeland is allowed 24 hours to report noncompliances with the permit that might

endanger health. Report should be immediate, not within 24 hours.

13. If the well is temporarily abandoned and loses mechanical integrity, Beeland has 30 days to repair and retest the well. This is unacceptable for the protection of the USDW as backup from nearby injection wells could be occurring during the 30 day period.

14. Beeland appears to be under the honor system in construction of this well in accord with specifications. How can the local residents determine if Beeland has actually followed the specifications?

15. Every twelfth month Beeland is required to submit a certified statement that no waste streams other than those identified in the permit have been injected. Again it appears the residents have only Beeland's honor as guarantee of their having complied with this aspect of the permit.

16. Beeland need report only monthly their noncompliance with the permit to the EPA. This would seem to increase the chances of continued noncompliance up to 30 days. Again, any noncompliance should be reported immediately.

17. In-situ stress tests rely on Beeland's honor as there is no requirement that they be observed by the EPA or performed by an independent source.

18. The Corrective Action Plan does not state any required notification by Beeland to the residents around the well site.

19. Minimum monitoring of injection fluid composition does not include monitoring for lead, previously identified as a contaminant from the source site.

20. Remote monitoring of the well, with weekly operator inspection and as otherwise permitted during injection periods, subjects the residents and their drinking water to an unacceptable level of risk. A trained operator should be required at the site of the well during injection.

21. The permit provides no protection from potential sabotage or terrorist use of the well site.

2386 Sumatran Way #50
Clearwater, FL 33763
July 27, 2007

Ray Vugrinovich, MDEQ
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Constitution Hall
525 W. Allegan St.
1-South
P.O. Box 30256
Lansing, MI 48909-7756

RE: Mineral Well Permit Application for Beeland Disposal Well No. 1 (January 5, 2007)

Dear Dr. Vugrinovich:

With regard to Beeland's Application, I am concerned about its inaccuracies, poor technical content, and numerous omissions of information required by law as stated in Michigan's DEQ form, "Permit Application Instructions for Disposal, Storage, or Brine Production Wells." As examples of my concerns, I have included below some comments on the Application (organized under eleven topics)

I am also attaching a separate e-mail document of comments I previously submitted in writing to the EPA regarding the Beeland well. Those comments are additional to those of today.

Beeland has failed to properly evaluate the probable impact of its proposed well as required by the application process. It should be assumed that Beeland would be just as careless and non-compliant in its construction and operation of the proposed well. The permit should be denied.

Very truly yours,

Patricia Patterson, Ph.D. Geophysics

EXAMPLE COMMENTS ON APPLICATION

EXISTING FRACTURES AND FAULTS

In its required discussion of existing fractures and faults, Beeland (p.40) states: "There

is no evidence of significant faulting in the immediate vicinity of the Proposed . . . Well . . ." Beeland references a 1992 document for that conclusion, the Hydrogeologic Atlas of Michigan. Beeland further states: "Additionally, Ryder (1996) constructed a structure contour map on the Traverse in Antrim county. This map showed there to be no mappable faults transecting the Traverse at the proposed well location." Beeland also states: "Transmissive fractures are not known to be present in this shale [the Bell Shale]" (p.39). Whereas computational capabilities to analyze large databases have increased tremendously in recent years, Beeland's required maps of the Dundee and Traverse, provided as Figures 16 to 19 of its Application, date from 1974 and 1980 documents.

According to a recent study funded by the Department of Energy, the proposed Beeland well appears to lie between what may be two major fault lines running across Antrim County NW to SE. (J. R. Wood & W. B. Harrison, "Advanced Characterization of Fractured Reservoirs in Carbonate Rocks: The Michigan Basin," Final Report for DOE Award No. DE-AC26-98BC15100, Sept. 2002). Based on their detailed (using 10 foot contour intervals) and comprehensive analysis of existing data from 55,000+ wells, the authors concluded that the Michigan Basin is extensively faulted and fractured, with major hydrocarbon accumulation occurring in small anticlines on the upthrown side of the faults. Their study demonstrates that faulting is more pervasive than previously believed in the location and productivity of oil and gas fields. It indicates that faults extend to higher stratigraphic levels than previously interpreted. They believe fractures occur preferentially in black shales because of their low Poisson's ratio and probable high fluid pressure owing to gas generation.

Thus much faulting is likely present in gas-rich Antrim County, and fractures are more likely to be present in the Bell Shale than previously thought. Beeland claims the Bell Shale, overlying the Dundee Limestone, will be the arrestment interval, preventing migration of its injected fluid upward. Beeland's Application fails to address the results and conclusions of the 2002 study or to reference it. Beeland's latest document referenced is the 1996 atlas.

SURVEY REPORT

The Survey Record (form EQP 7200-2) requires a separate plat or plot plan that locates, identifies, and shows distances to: Surface waters and other environmentally sensitive areas . . ., Floodplains . . ., Wetlands. . ., Natural rivers . . ., Threatened or endangered species, . . . within 1,320 feet of the proposed well, and various man-made objects and water wells type within specified distances from the staked well location. The Survey Record and plat are not at the end of Section A 4 as stated in the Application (p.5) but in Attachment A toward the end of the Application.

The Plot Plan attached to the Survey Report:
- Spans at most 800 feet north, south, east, or west from the well stake, whereas reportable items may lie 2000, 1320, or 600 feet from the staked well location.

• Fails to include a graphic of the map's scale.
• Fails to show objects in proportion to their relative distances that are noted on the map. For example, if the road is 495 feet from the stake, then the Existing Gas Well is around 852 feet from the stake, not 975 feet, as noted.
• Fails to show all the woods that based on its attached photos appear to lie within 1320 feet of the staked well location.
• Fails to show structures alluded to in other parts of the Application as lying within the specified areas.

Beeland seems to base its "survey" on available data rather than actual survey. Beeland states, "Available information indicates that there may be a single fresh water well (No 99-524) within the specified 600 feet radius" (water wells also indicated on form EQP 7500-3), but those wells are not shown on the plot plan, as required. Beeland states, "Available data show there to be two structures and two roads (one public, one private) within the radius" (also indicated on form EQP 7500-3), but these man-made features are not shown on the plot plan, as required. Beeland states, "Location maps showing the general location of groundwater wells are provided in Figures 4 and 6," but Figure 6 shows no groundwater wells, and Figure 4 states as its source two internet addresses. Beeland states, "Based on available data, no public water supply wells of any type have been identified within 2,000 feet of the proposed well location" (p.7). Beeland concludes that "no known hazardous waste treatment storage or disposal facilities are present within the AOR based on available state of Michigan permit information" (p.59). An actual survey, including interviewing residential neighbors, should have looked for and identified the locations of these things so they could be shown on the plot plan, as required if they exist.

Beeland identifies the bald eagle, the Eastern Massasauga rattlesnake, and Pitcher's thistle as threatened or candidate threatened species that "may be present in Antrim County." Beeland fails to show any of these on its plat plan, as required if present. Beeland claims instead, "Field verification by the property owner [i.e., Beeland] has not identified the presence of these within the specified radius of 1,320 feet" (pp.6-7). Beeland fails to define or describe what constituted its "field verification." The photos included with the Application seem to show much woodland that could harbor those species.

BEELAND'S ANALYSES OF WELL'S IMPACT ON USDW

For calculation of Pc, critical pressure (pp. 23-24) to raise brine from top of injection interval to base of the underground source of drinking water (USDW), Beeland's assumed model for analysis is a very simple one-dimensional hydrostatic model. It does not consider dynamic effects, such as resulting from pressure gradients at the drinking water aquifer boundary. And Beeline assumes single values for parameters whose values are unknown, rather than assuming probable ranges for those values. Beeland fails to give units, specific gravity is reported as density, and symbols used are mixed up (gamma for γ).

Beeland refers to its use of 900 feet to depth of base of USDW as "conservatively assigned." The closest well (permit #41955) for which Beeland has attached data [in Attachment C], however, found the base of the glacial drift or USDW to occur at 907 foot depth. That well was drilled about 0.4 miles from the proposed Beeland site.

Two important unknowns in Beeland's model calculation are the specific gravity of the injection-zone fluid (Beeland assumes this is brine) and the pre-injection pressure at the base of the Dundee. If the injection zone contains gas, the specific gravity could be lower than Beeland's assumed 1.05. If the specific gravity were assumed to be 1.0, then, using Beeland's other assumed values, the critical pressure, Pc, would be around 92 psi, rather than 119 psi. Small changes in Beeland's assumed constant fluid gradient of 0.35 psi/ft can also result in significant change in Pc. For example if 0.36 is used instead of 0.35, then, using Beeland's other assumed values, Pc would be 97 psi. With both of these small changes in assumed values, Pc would be 70 psi, rather than 119 psi, and based on its simple model, the likelihood of Beeland's exceeding the lower critical pressure would be greater. So Beeland's computed (p. 24) critical pressure of 119 psi for contamination of the drinking-water aquifer represents a very, very rough guess.

Beeland then attempts to show that 20 years of Bay Harbor contaminant injection into the Dundee reservoir at rate of 200 gallons/minute will not exceed the critical pressure of 119 psi , even in the reservoir at distance within 5 feet of the well. For that analysis, at the bottom of p. 24 Beeland gives a "cookbook" formula for pressure rise, dP, without identifying it or its source, some of the parameters in the formula, or any of the assumptions made in its derivation and necessary for its correct application. Beeland uses the dP formula assumedly to compute the increase in pressure at the base of the Dundee at 5 feet from the point of well penetration after 20 years of injection of 200 gallons/minute of Bay Harbor waste. Beeland computes this value to be 115 psi. Because that is less than its previously computed critical pressure of 119 psi, Beeland concludes the well has no cone of influence.

The parameters that Beeland plugs into the formula (p. 25) seem to be at best very rough guesses, including:

Thickness, h = 100 feet [assumedly of the Dundee injection zone]
Formation volume factor, B = 1.015 feet [not defined or otherwise explained]
Porosity = 0.10 [unknown and pulled out of air]
Permeability, k = 1 Darcy [unknown and estimated as quite high]
Viscosity = 1.05 centipoise @ 72 deg. F [unknown, as well as temperature, with which viscosity varies greatly]
Total compressibility, Ct = 8 x 10-6 psi -1 [unknown]
?, s = ? [unidentified parameter in formula, and we are not told what value Beeland assumes for it]

Beeland gives no justification, explanation, or references for the parameter values it has

assumed other than they "have been assigned based on site-specific information" (p. 24). Beeland did state, however, on page 22: "Information used in the following calculations has been estimated from logs and available neighboring well information summarized in this document." I was unable to find any such information in or summarized in this document. One wonders why Beeland has not referenced any information or test data from the existing injection well that this well is to replace. Could it be that Beeland or CMS has not been doing the required testing for that well?

Some data provided in the Application relates to the Dundee's porosity and is from well (permit 46244 in Section 1 of same township/range) that stated for the Dundee Limestone (at 2110 to 2174 foot depth) limestone, "microcrystalline to extremely fine, dense to poor porosity," (at 2174 to 2222 foot depth) dolomite, "extremely fine to microcrystalline, good to fair porosity"; (at 2222 to 2315 foot depth) dolomite and limestone, "microcrystalline to extremely fine, good to poor porosity." Another well that could be relevant (permit 27750 in Section 26 of same township/range) drilled through the Dundee, but of its detailed 7 page Formation Record, the page covering Dundee depth 2300 to 2780 is completely omitted from Beeland's Application. Beeland plans to drill to depth 2450 feet (form EQP 7200-1).

The formula (bottom p. 24) must assume, among other simplifications:
- All of the parameters remain constant for 20 years of injection.
- Beeland's injection fluid does not alter or interact with whatever it comes into contact with.
- Permeability in the Dundee Limestone is homogeneous and horizontally isotropic and quite high at 1 Darcy. Hence there are no preferred horizontal directions of fluid migration.
- Beeland injects into an unbounded reservoir without any interaction with the fluid dynamics of the more than 100 wells lying within 2 miles of it, including three wells (one only 0.4 miles away) that have been injecting salt-water and other substances into the Dundee Limestone at least intermittently since around 1989, 1989, and 1992.

Beeland then concludes: "Due to the relatively high permeability and relatively low original pressure of the Dundee Limestone injection formation at this site [both roughly guessed], there exists no potential for contamination of USDW resources due to improperly completed or abandoned wells within the statutory minimum 2 mile radius area of review" (p. 25). Beeland fails to provide "3. A plat which shows the location and total depth of the proposed well, shows each abandoned, producing, or dry hole within the area of influence, and each operator of a mineral or oil and gas well within the area of influence," as required by law per the permit application instructions. (Beeland's Figures 4 and 6 do not show this required information.)

Beeland is also required to but does not provide: "5. Plugging records of all abandoned wells and casing, sealing, and completion records of all other wells and artificial penetrations within the area of influence of the proposed well location and a map identifying all such artificial penetrations. An application shall also submit a plan reflecting the steps or modifications believed necessary to prevent proposed injected

waste products from migrating up, into, or through inadequately plugged, sealed, or completed wells." Rather than providing the required well information and plan, Beeland concludes "a corrective action plan is not required for any of the artificial penetrations within the proposed Beeland well AOR because, based on calculations, there is no cone-of-influence and there are no artificial penetrations to the injection zone within the area of review that have the potential for allowing injection activities to have an impact on the USDW" (p. 31).

The formula Beeland gives at the bottom of page 24 (used to conclude "there is no cone-of-influence") is in fact a transient solution to a partial differential equation for radial flow from a well into a reservoir. Within the framework of other simplifying assumptions, it is valid only until boundaries affect the data. It is used for falloff testing and cannot be applied correctly to model the effects of 20 years of fluid injection. See EPA document, "The Nuts and Bolts of Falloff Testing," 2003.

Beeland is required to provide information to characterize the proposed injection zone (p.47), including:
D. Effective porosity of the injection zone including the method of determination.
E. Vertical and horizontal permeability of the injection zone and the method used to determine permeability. Horizontal and vertical variations in permeability expected within the area of influence.
F. The occurrence and extent of natural fractures and/or solution features within the area of influence.

Beeland does not provide the required information. Relative to the above it states: "The effective porosity of the Dundee is estimated as approximately 10% but will be determined through well log calculations after the well is installed. Horizontal permeability of the injection interval is estimated as approximately 1 Darcy, and vertical permeability is unknown. The occurrence and extent of fracturing specific to the Disposal well location will be assessed through drilling and wireline logging of the hole" (pp. 47-48).

Similar information is required for the proposed confining zone with addition of grain mineralogy and matrix cementing. Again Beeland does not provide the required information but states relative thereto: "The confining zone includes all rock units from the Antrim to the top of the Dundee . . . . Lithologic characteristics of these units are described in section B.7, above. Effective porosities of each zone are estimated as between 2 and 20%. The vertical and horizontal permeability of the confining zone is estimated as being substantially less than 0.1 md. Formations included as part of the confining zone are expected to be laterally continuous . . . and are not expected to exhibit extreme variations in effective permeability within the area of influence. The occurrence and extent of natural fractures and/or solution features within the area of influence will be assessed through wireline logging during drilling. . . (p. 49)"

Impact of injection (p. 25): Beeland's spreading model with assumption of 10% effective porosity over 100 ft. thick reservoir is not substantiated and is likely high so

underestimates spreading impact. The model also incorrectly assumes Beeland's well is an isolated source that spreads by diffusion and incompressible mass conservation, ignoring pressure effects from other sources and sinks, directional variations, chemical interactions, fingering, etc.

OTHER WELLS WITHIN 2 MILES THAT DRILLED INTO OR THROUGH DUNDEE LIMESTONE

Beeland states (p.30) that only four of 109 wells within 2 mile radius actually penetrated into the Bell Shale or Dundee Limestone. Three of these are active Class II brine disposal wells (41955, 42680, and 46244), and one was plugged in 1969 as a dry hole (27750). And "due to the small pressure rise associated with projected injection activities and the corresponding limited cone-of-influence, it is noted that none of the wells within the regulatory minimum two-mile AOR could have the potential for causing any endangerment to USDW . . . ." Significantly, Beeland does not even provide a plat showing the location of these four wells (listed in Table 4) relative to its proposed well.

Beeland was required to include a map showing the locations, depths, and operators of all well within 2 miles of the proposed well. It instead lists some 109 wells in tables and includes as Figure 6 a printout (apparently from MDEQ's online database) that covers a much larger area and has scale so small that the wells cannot easily be located and their depths and operators are not given, as required. The four most significant Dundee wells are not designated on that map, and I was unable to locate one of the four (#46244).

SURFACE WATERS AND SUBSURFACE AQUIFERS

The Application requires: "6. A map showing the vertical and areal extent of surface waters and subsurface aquifers containing water with less than 10,000-ppm total dissolved solids. A summary of the present and potential future use of the waters must accompany the map."

For the subsurface aquifer, Beeland does not include a map showing the vertical extent of the subsurface aquifer. To show its horizontal extent, Beeland attaches a USGS undated map (Figure 14), (presumedly from the 1992 Michigan Groundwater Atlas). The map spans four states, and its scale is such that details around the proposed well site are not clear. It does appear to show, however, that over Michigan and near the proposed well site, there are areas where glacial deposits are thin or missing, which sites might be better than Beeland's proposed site for a contaminant injection well.

Beeland's required use summary (two sentences long) is not responsive to the Application requirement but states: "In Michigan, the Glacial Till and/or unconsolidated material is a source of fresh water for domestic, industrial, and agricultural purposes (Olcott, 1992). Based on available data, this unit is anticipated to be the lowermost

USDW. This will be confirmed during installation of the proposed well" (p. 36). How Beeland intends to confirm during installation of its well that the Glacial Till is the lowermost USDW would be of interest.

DRILLING THROUGH SALT

In the required "Environmental Impact Assessment for Mineral Wells and Surface Facilities" form (EQP 7500-3), Beeland reports the well will not be drilled into or through bedded salt deposits. Beeland states no evidence supporting that conclusion. Beeland plans to drill to approx. 2450 feet, into the top of the Detroit River Group Dundee Limestone. Information from nearby wells indicates a not insignificant chance Beeland will drill through salt. A well (permit 41955) in adjacent Section 23 drilled for purpose of salt-water injection into the Dundee Limestone drilled through scattered beds of anhydrite (abundant in the cap rock of salt domes) at depth of 2385 to 2411 feet. Beeland has omitted very important information from Shell Oil's nearby well (27750) in Section 26. It omits page 4 of Shell's sample description covering the 2300 to 2780 foot depth, where the Dundee began at 2172 and continued at least to 2300. At 2798, Shell hit salt, but what did it hit from (omitted) 2300 to 2780 feet, the very region most relevant to Beeland? And nearby well 42680 hit scattered anhydrite beds within the Dundee (2061 to 2141 feet) and hit salt at depth 2472 feet. (Beeland has included the data on these wells at the end of the Application.)

Form EQP 7500-3 requires Beeland to describe its plans for handling and disposing of drill cuttings and to provide other information, if the well is drilled through bedded salt deposits. Beeland does not describe such a plan and provide that information, even though there is a significant probability it will drill through salt.

POSSIBLE RADIOACTIVE CONTENTS OF WASTE TO BE INJECTED

Potassium and sulfate appear to be the contaminants in highest concentration in the injectate (pp. 44-45). Does this include significant amounts of radioactive potassium?

SOME PROBLEMS WITH FORM EQP 7200-4, "INJECTION WELL DATA"

No. 10. Fracture pressure of confining formation is given as "1720 at base" without units. Showing of calculation is required but not provided in a meaningful manner [no units stated].

No. 11. Fracture pressure of injection formation "1720 at base" without units. This is clearly incorrect as equal to that of confining formation. Showing of calculation is required but not provided in a meaningful manner [no units stated]

No. 12. Specific conductance of representative sample of injection fluid is given as

"TBD." Beeland has been operating another injection well for disposal of the injection fluids. If Beeland has complied with laws/regulations for periodic testing of that well, then the specific conductance should have been determined already, not TBD.

No. 9. Maximum bottom hole injection pressure is given as "1221" without units. Showing of calculations is required but not provided in a meaningful manner.

PIT FLUIDS & DRILLING FLUIDS

In the "Environmental Impact Assessment for Mineral Wells and Surface Facilities" form (EPQ 7500-3), Beeland answers "yes" to "Will any pit fluid be disposed by a licensed liquid waste hauler?" But Beeland's Waste Analysis Plan, dated October 6, 2006 (attached to the Application), states that "fluids generated at the disposal well facility operation itself" will also be injected into the well" (section 1.B). Form 7500-3 requires Beeland to describe disposal plans for pit fluids, which Beeland does not do.

"Fresh water will be used as drilling fluid, trucked to the site using local oilfield suppliers or a pre-existing water well already located on the property for water during drilling and testing of well" (p 15). But the Survey Record Plat fails to identify specifically the pre-existing water well on the property that might be used.

TRUCK TRAFFIC

In the "Environmental Impact Assessment for Mineral Wells and Surface Facilities" form (EPQ 7500-3), Beeland reports that anticipated frequency of truck traffic entering the site, less than 20 trucks per day, will not appreciably increase traffic in the area. How does Beeland reach that conclusion without any analysis of existing traffic in the area? Furthermore, twenty trucks/day for 20 years (p. 2) is 292,000 truck trips past my niece's home on Alba Highway, including on icy roads. And additional trucks will be required during drilling and testing operations for supply of drilling fluid and disposal of pit fluid.

LAND USE

In the "Environmental Impact Assessment for Mineral Wells and Surface Facilities" form (EPQ 7500-3), Beeland reports that present land use is "woodlands and crop/agricultural areas" but previously reported on page 6 that the area "is used for agricultural and residential purposes."

* * *

My comments to you are additional and not repeats of those I submitted to the EPA.

Please let me know if these documents are not readable on your computer.

Thanks for your consideration.

Patricia Patterson

Comments on the impact to the Jordan National Wild and Scenic River by the Proposed Waste Injection well at or near Alba Michigan T30N, R5W, Section 14 SE ¼ (Beeland #1)

Groundwater at the proposed injection site (T30N, R5W, Section 14 SE ¼) discharges to the Jordan National Wild and Scenic River (see Public Law 90-542, 16. U.S.C. 1271 to 1287). This nationally recognized treasure is hydrologically unusual in that the groundwater basin (groundwater catchment area) is nearly double the size of the topographic basin and extends eastward toward Otsego Lake (see figure below). Thus, the proposed injection well location is within the groundwater divide of the basin and any induction of solutes into freshwater aquifers in this area would enter the Jordan River.

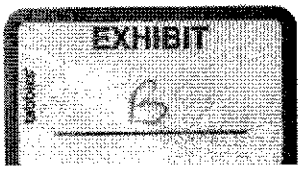
From this proposal it appears that there are three possible ways for either waste fluids or displaced native brines to enter the Jordan groundwater basin:

1) Highway accidents in transportation of waste fluids to the injection well.
2) Accidents in transferring the waste fluids to the holding tank at the injection site and or leakage of the holding-tank injection-well system.
3) Increase of fluid pressure in receiving formation that would cause upward transport of either native or injected fluids to the potable ground-water aquifer through leakage of abandoned or current oil and gas wells and natural fractures. Water quality causing formation damage could increase in pressure beyond proposed limits.

Number 1 above
If fluids from the groundwater remediation site near Bay View are to be transported by truck to the injection well, it is possible that they will encounter highway accidents that would cause discharge or spillage of the waste to surficial aquifers. It seems prudent to require reporting of any accidents regarding spilling of the wastewater on or near the highways to be reported to appropriated Michigan DEQ officials within the day, in order that rapid remediation measures be instituted.

Number 2 above
As the waste is corrosive (high pH and high dissolves solids) holding tank and injection system must be constructed of special corrosion resistant material. It seems prudent to require at least 3 groundwater monitor wells installed near the injection site and these be monitored on a regular (3 months basis) for one or two contaminates for the life of the project.

Number 3 above
I have checked the calculated the pressure heads at 1 year, 10 year, and 20 years time at distance intervals of 1, 1000 and 10,000 meters from the injection well and they fall within the COI (cone of influence) values calculated in the proposal. It would seem prudent to run tracer tests with packers to check for vertical fractures. I would further recommend conducting mixing models (both thermodynamic and kinetic) with computer program such as PHRQPITZ and PHREEQC to check for the likelihood of mineral precipitation when the native and waste fluid are mixed. The high alkalinity wastewater



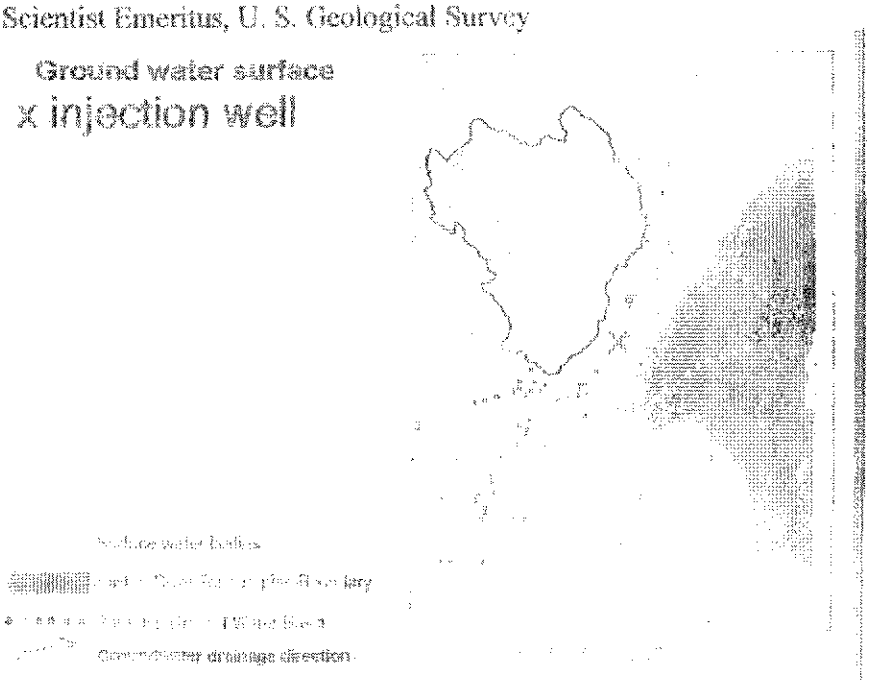
would seem likely to react with the typically high calcium and magnesium water of the native formations found in the Michigan Basin and thus, forming a carbonate precipitate. I did not find examples of water chemistry of the Dundee Formation in the proposal but with the multitude of wells in the area, surely these analyses must exist. Precipitation of minerals could reduce the permeability of the formation near the well face and rapidly increase the pressure head to unacceptable levels.

Evaluation of the application by the Beeland Group LLC indicates they appear to have complied with the state requirements covering the application to construct a waste disposal well and engineering support of the site. The hydrogeology, while generalized and optimized in terms of parameter values (rather than a range of likely values), appears to be reasonability described and required pressure calculations appear to be correct for the assumed conditions.

Because of the unique nature of the Jordan National Wild and Scenic River it would seem prudent to select another disposal site. The concept of an injection well and the chosen injection formation for sequestration of this waste appears to be technically sound, however, the location is poor because in case of an accident the potential negative impact could be catastrophic on the flora and fauna. In a nutshell "Good concept, poor location"

Sincerely,

Warren W. Wood Ph.D.
John Hanna Professor of Integrated Studies Michigan State University
Visiting University Professor, Oxford University, Oxford, UK
Scientist Emeritus, U. S. Geological Survey



From: Timothy McGarry
To: Frank Ruswick; Jim Sygo
Date: Fri, Sep 7, 2007 8:47 AM
Subject: Fwd: Re: Bass Island Formation - Little Traverse Bay Release Site

fyi

Timothy J. McGarry
Chief,
Office of Civil Enforcement Coordination
DEQ Executive Division
517-241-2050

>>> Robert Wagner 9/7/2007 8:14 AM >>>
Confirmation that formations suitable for a UIC well exist much closer to the site than stated by CMS. CMS has publically stated the Alba location to be the "only" possible location having suitable geology to place a UIC well. Also, there are locations much closer to the point of leachate generation that have Class A roads and are rural, another CMS requirement as I understand it. Of course, a location within pipeline distance would negate the Class A road requirement and the truck traffic associated with hauling leachate. That is not to say the Alba location is unsuitable, just that it is not the "only" option available to CMS. As I stated earlier, the business part of choosing to haul water across two counties is not consistent with other private companies who place the UIC well at the point of waste generation. No clear understanding of the economics behind such a decision, but if you compared pipelining to trucking I think using the pipeline would be the more economical choice. That's important in the long run for every final remedy with respect to a 30 year financial decision & commitment. Maybe that is why the Alba UIC well was not included in the FS for evaluation?

>>> <Dollhopf.Ralph@epamail.epa.gov> 09/06/07 4:39 PM >>>
Ramification being...good site?

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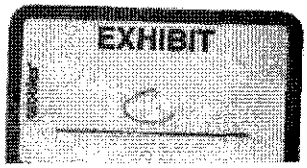

Subject
Bass Island Formation - Little
Traverse Bay Release Site

FYI, see attached Permit to Plug Exploratory Boring #29119 located in Charlevoix County approximately 3 miles from the Little Traverse Bay Release Site. The boring log identifies the Bass Island formation at a depth of 1608 feet. See attached map, as well.(See attached file: Permit 29119.PDF)

CC: Harold Fitch; Steven Chester

BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In Re:

UIC Appeal Nos. 08-01, 08-02, 08-03

Beeland Group, LLC

UIC Permit No. M1-009-11-0001

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CERTIFICATE OF SERVICE

I hereby certify that copies of Petitioners Star Township, Antrim County, and Friends of the Jordan River's Reply to Intervenor/Respondent Beeland Group LLC's Response to Petition No. 08-02 were sent to the following persons in the manner indicated:

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Dated: April 28, 2008

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