

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

In re: )  
 )  
West Bay Exploration Company, )  
Traverse City, Michigan, )  
West Bay 22 SWD, )  
Permit No. MI-075-2D-0009 )  
 )

Appeal No. UIC 13-01

RESPONSE TO PETITION FOR REVIEW

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APPENDIX A: CERTIFIED INDEX OF ADMINISTRATIVE RECORD

APPENDIX B: DOCUMENTS IN THE ADMINISTRATIVE RECORD REFERENCED IN THIS RESPONSE TO PETITION FOR REVIEW:

- B-1 Petition for Review by Peter Bormuth, dated January 7, 2013 and regarding Underground Injection Control (“UIC”) Permit No. MI-075-2D-0009.
- B-2 Class II UIC Permit Application for West Bay 22 SWD; West Bay Exploration Company, dated March 20, 2011.<sup>1</sup>
- B-3 Draft UIC Permit No. MI-075-2D-0009, West Bay 22 SWD, including Statement of Basis for Issuance of Underground Injection Control (UIC) Permit.
- B-4 Public notice, first public comment period for draft UIC Permit No. MI-075-2D-0009, dated January 20, 2012.
- B-5 Public notice materials, second public comment period for draft UIC Permit No. MI-075-2D-0009, dated April 2012 through May 2012.
- B-6 Comments by Peter Bormuth during second public comment period, May 23 and 29, 2012.
- B-7 Response to Comments Regarding the Underground Injection Control (UIC) Permit # MI-075-2D-0009 Issued to West Bay Exploration Company for the West Bay #22 Well in Jackson County, Michigan for the Purpose of Disposal of Oil and Gas Related Brine, dated December 6, 2012.
- B-8 Final UIC Permit No. MI-075-2D-0009, dated December 6, 2012, with transmittal letter dated December 10, 2012.
- B-9 Endangered Species Act Compliance Determination, dated December 8, 2011.
- B-10 Conley and Bundy, 1958, *Mechanism of Gypsification*, *Geochimica et Cosmochimica Acta*, v. 15
- B-11 Hardie, 1967, *The Gypsum Anhydrite Equilibrium at One Atmosphere Pressure*, *The American Mineralogist*, Vol. 52, January-February
- B-12 Murray, 1964, *Origin and Diagenesis of Gypsum and Anhydrite*, *Journal of Sedimentary Petrology*, Vol. 34, No. 3

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<sup>1</sup> Two maps in Attachment L of this permit application are 11” x 17”. To facilitate e-filing and to facilitate copying by all parties during this appeal, Region 5 has reduced these maps in size to 8 ½” x 11” in Attachment B-2.

- B-13 Ogniben, 1955, *Inverse Graded Bedding in Primary Gypsum of Chemical Deposition*, Journal of Sedimentary Petrology, Vol. 25, No. 4, pp. 273-281
- B-14 Sass & Burbaum, 2010, *Damage To the Historic Town of Staufen (Germany) Caused by Geothermal Drillings Through Anhydrite-Bearing Formations*, ACTA Carsologica, 39/2 Postonjna
- B-15 Sievert, Wolter and Singh, 2005, *Hydration of Anhydrite of Gypsum (CaSO<sub>4</sub>.II) in a Ball Mill*, Cement and Concrete Research, Vol. 35, pp. 623-630

## I. INTRODUCTION

The United States Environmental Protection Agency, Region 5 ("Region 5") hereby responds to Appeal No. UIC 13-01, the Petition for Review ("Petition") by Peter Bormuth ("Petitioner") dated January 7, 2013 and regarding Underground Injection Control ("UIC") Permit No. MI-075-2D-0009.

Petitioner filed the Petition with the Environmental Appeals Board ("Board"), seeking review of Region 5's decision to issue a final Class II UIC permit to West Bay Exploration Company of Jackson, Michigan ("West Bay"), pursuant to the Safe Drinking Water Act, 42 U.S.C. §§ 300f et seq. ("SDWA"). Petitioner argues that: 1) the injectate will dissolve a confining layer and migrate upward to contaminate an underground source of drinking water ("USDW"); and 2) injection site activities will expose an endangered species, the Indiana Bat, to toxic chemicals. Petitioner relies extensively on arguments and supporting materials that Petitioner did not raise to Region 5 during public comment. The Petition makes multiple arguments, all of which fail to meet threshold standards in that they variously 1) fail to identify a specific permit condition for review; 2) fail to indicate Petitioner's participation in public comment and demonstrate that the conditions for review raised in the Petition were raised during the public comment period; 3) raise a novel argument on appeal; 4) fail to address Region 5's responses to Petitioner's specific comments and explain why those comments are inadequate; and 5) seek review of issues outside the boundaries of the UIC permitting program. Further, were the Board to evaluate any of Petitioner's arguments regardless of the above deficiencies, enough information exists in the administrative record to conclude that each of these arguments fails to show that EPA's decision was based on a clearly erroneous finding of fact or conclusion of law, or involved an exercise of discretion or an important policy consideration which the

Board should, in its discretion, review. For these reasons, Region 5 recommends that the Board deny the Petition.

## II. FACTUAL AND PROCEDURAL BACKGROUND

Congress, in passing the SDWA, directed EPA to promulgate regulations containing minimum requirements for state UIC programs to protect USDWs. 42 U.S.C. § 300h.<sup>2</sup> Accordingly, states must submit UIC programs to EPA for approval. 42 U.S.C. § 300h-1.<sup>3</sup> EPA approves state UIC programs when they meet EPA's minimum regulatory requirements. One of these minimum requirements is that a person who intends to operate an underground injection well must obtain a permit for such activities, unless the well is authorized by rule. 42 U.S.C. § 300h-3; 40 C.F.R. §§ 144.1(g) and 144.31.

In states where EPA has not approved a UIC program, EPA directly implements its own UIC program and regulations. The State of Michigan ("Michigan") has not been approved to administer the UIC permit program. Accordingly, Region 5 has the responsibility to carry out UIC requirements, including the issuance of permits within Michigan. 40 C.F.R. §§ 144.1(e) and 147.1151.

On April 21, 2011, Region 5 received a UIC permit application from West Bay, dated March 20, 2011, to construct and operate a Class II well in Jackson County, Michigan for the purpose of noncommercial disposal of brine from multiple production wells. Att. B-2. The application proposed an injection zone consisting of the Salina A-1 Evaporite; Cain Formation;

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<sup>2</sup> EPA promulgated initial regulations to implement these statutory provisions in the early 1980s. *See* 45 Fed. Reg. 42,472 (June 24, 1980) (codified, as amended, at 40 C.F.R. Part 146) (technical well criteria and standards); 48 Fed. Reg. 14,146 (Apr. 1, 1983) (codified, as amended, at 40 C.F.R. Parts 144-146) (UIC program rules); 49 Fed. Reg. 20,138 (May 11, 1984) (codified, as amended, at 40 C.F.R. Parts 144 and 147) (EPA-administered UIC programs).

<sup>3</sup> *See also* 40 C.F.R. § 144.1(e) (requiring all 50 states to submit UIC programs).

and Niagara Group, at depths of 2,662-3,032 feet. *Id.*, Att. G, p. 3 of 8. The application proposed the Salina A-2 Evaporite as an upper confining zone, at depths of 2,634-2,662 feet. *Id.*, Att. G, pp. 2-3 of 8. The application stated that the deepest USDW in the area is the Marshall Sandstone, extending down to a depth of 226 feet. *Id.*, Att. E, p. 2 of 8.

In January 2012 Region 5 issued the draft West Bay permit, UIC Permit No. MI-075-2D-0009. Att. B-3. The draft permit package included a Statement of Basis, which explained Region 5's bases for finding the proposed well acceptable. The Statement of Basis and the draft permit only authorized injection into the Niagara Group, the deepest part of the applicant's proposed injection zone. *Id.*, Statement of Basis p. 1; permit, p. 1 of 15, p. A-1 of 1.<sup>4</sup> This change meant that the Salina A-1 Evaporite and the Cain Formation would act as additional confining layers for injections occurring under this permit.

The public comment period for draft Permit No. MI-075-2D-0009 ran for 30 days from January 30, 2012. Att. B-4. Petitioner did not comment on the draft permit during this comment period. Region 5 received requests for a public hearing and created a second period of public comments on the draft permit running from April 17, 2012 through June 1, 2012. Att. B-5. This period included a public meeting on May 23, 2012. *Id.* Petitioner provided timely oral comments to Region 5 at the public meeting and timely written comments to Region 5 via email dated May 29, 2012. Att. B-6.

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<sup>4</sup> The authorized injection depths did not change between the permit application and the draft permit. But EPA-issued UIC permits authorize injection only into specific formations, with the injection depths in a UIC permit serving only as an approximation of formation depth. See definition of "injection zone" at 40 C.F.R. § 144.3: a geological "formation", group of formations or part of a formation receiving fluids through a "well". EPA regulates UIC injections by formation and not by depth because the characteristics of the receiving formation are critical. Using available stratigraphic data, a trained technical person can make a good estimate of a formation's depth at a given location. But the upper and lower bounds of an injection zone formation still vary from one location to another and can only be determined precisely upon drilling at the specific well location.



On December 6, 2012, EPA issued a Response to Comments that addressed all public comments regarding draft Permit No. MI-075-2D-0009. Att. B-7. Region 5 received numerous comments regarding West Bay 22 SWD, with some topics receiving identical or similar comments from multiple commentors. Accordingly Region 5 addressed comments by topic, not by individual commentor. Att. B-7. EPA mailed a copy of the Response to Comments to Petitioner.

EPA issued the final permit Permit No. MI-075-2D-0009 on December 10, 2012, with an effective date of January 9, 2013. Att. B-8. Like the draft permit, the final permit only authorized injection into the Niagara Group. *Id.*, p. 1 of 15; p. A-1 of 1. Petitioner then timely filed the instant Petition with the Board. Region 5 now files this Response to Petition for Review in accordance with the Board's January 14, 2013 letter to Region 5.

### III. STANDARD OF REVIEW

In any appeal of a permit issued under 40 C.F.R. Part 124, the petitioner bears the burden of demonstrating that review is warranted. 40 C.F.R. § 124.19; *see In re City of Palmdale*, PSD Appeal No. 11-07, slip op. at 9 (EAB Sept. 17, 2012), 15 E.A.D. \_\_\_\_; *In re Wash. Aqueduct Water Supply Sys.*, 11 E.A.D. 565, 573 (EAB 2004); *In re Am. Soda, LLP*, 9 E.A.D. 280, 286 (EAB 2000). To satisfy this burden, the petitioner must meet threshold pleading requirements, including "timeliness, standing, preservation of issues for review, and articulation of the challenged permit condition with sufficient specificity." *In re Cherry Berry B1-25 SWD*, UIC Appeal No. 09-02 at 2 (EAB Aug. 13, 2010) (Order Denying Review) (quoting *In re Beeland Group, LLC* ("Beeland II"), UIC Appeal No. 08-02, slip op. at 8 (EAB Oct. 3, 2008), 14 E.A.D. \_\_\_\_); 40 C.F.R. § 124.19(a). The Board "has frequently dismissed petitions that failed to meet

these standards.” *Id.* at 2 (citations omitted).

The standards for a petition for review are set forth in 40 C.F.R. Part 124. A UIC permit may not be reviewed by the Board unless petitioner establishes either that the permit: 1) is based upon a “clearly erroneous” finding of fact or conclusion of law; or 2) involves an “exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review.” 40 C.F.R. § 124.19(a); see *In re Environmental Disposal Sys., Inc.*, 12 E.A.D. 254, 263 (EAB 2005) (citations omitted). A petitioner must establish either of these conditions through a three-part process: 1) identify specific permit conditions for review; 2) indicate the petitioner’s participation in public comment and demonstrate that the conditions for review raised in the petition were raised during the public comment period; and 3) address the Region’s responses to comments and explain why those responses are inadequate. *In re Presidium Energy, LC*, UIC Appeal No. 09-01 at 3-4 (EAB July 27, 2009) (Order Denying Review).

Petitioner appears to be a pro se petitioner, for whom the Board may relax some of the more technical pleading standards for petitioners unrepresented by legal counsel. *Id.* at 4; *Envtl. Disposal Sys.*, 12 E.A.D. at 292, n. 26; *In re Beckman Prod. Servs.*, 5 E.A.D. 10, 19 (EAB 1994). But even when liberally construed, a petition for administrative review must still identify the elements at issue in the permit and articulate how EPA erred or exercised its discretion in a manner that warrants Board review. *Presidium Energy*, UIC Appeal No. 09-01 at 4-5 (citing *In re Knauf Fiber Glass GmbH*, 8 E.A.D. 121, 127 & n.72 (EAB 1999); and *In re Envotech, L.P.*, 6 E.A.D. 260, 267-69); *Envtl. Disposal Sys.*, 12 E.A.D. at 292, n. 26; *Beckman Prod. Servs.*, 5 E.A.D. at 19. The Board has frequently denied review on petitions that are “merely ‘based on

numerous general concerns, without a single citation to a permit term or condition’ – a general expression of concern is simply not sufficient to show clear error in the Region’s permitting decision.” *Presidium Energy*, UIC Appeal No. 09-01 at 4 (quoting *In re Beeland Group, LLC* (“*Beeland I*”), UIC Appeal Nos. 08-01 through 08-03 at 11 (EAB May 23, 2008) (Order Denying Review). *See also Cherry Berry*, UIC Appeal No. 09-02 at 3-4 (citations omitted). And remarking that, “[i]t is not incumbent upon the Board to scour the record to determine whether an issue was properly raised,” the Board particularly imposes a burden on the petitioner to demonstrate in the petition that the issues raised therein were first raised during the public comment period on the draft permit. *Presidium Energy*, UIC Appeal No. 09-01 at 2 n.4 (quoting *In re Encogen Cogeneration Facility*, 8 E.A.D. 244, 250 n.10 (EAB 1999)). The Board has further stated:

The requirement that the petitioner must show that an issue was raised during the public comment period in order to preserve it for review on appeal is not an arbitrary hurdle placed in the path of potential petitioners. Rather, the requirement serves an important function related to the efficiency and integrity of the overall administrative permitting scheme. The rule’s intent is to ensure that the permitting authority has the first opportunity to address objections, and to give some finality to the permitting process. [*Presidium Energy*, UIC Appeal No. 09-01 at 2, n. 3 (citations omitted)]

And a petitioner is not only required to specify objections to the permit; he or she must also explain *why* the permit issuer’s previous response to comments is clearly erroneous or otherwise warrants review. *City of Palmdale*, slip op. at 10. The Board has frequently declined to review permits unless the petition for review establishes why the Region’s basis for its decision and response to the petitioner’s comments is clearly erroneous or otherwise warrants review. *Presidium Energy*, UIC Appeal No. 09-01 at 3 n.4; *Palmdale*, slip op. at 10. “On appeal, it is not sufficient to repeat objections made during the public comment period; rather, a

petitioner must also demonstrate why the permit issuer's response to those objections (i.e., the permit issuer's basis for its decision) is clearly erroneous." *In re Dominion Energy Brayton Point, LLC ("Dominion I")*, 12 E.A.D 490, 509 (EAB 2006).

When a petitioner follows the required procedure to raise an alleged ground for review, there is then the question of the Board's standard of review. The preamble to 40 C.F.R. Part 124 states that the Board's power of review "should only be sparingly exercised," and that "most permit conditions should be finally determined at the Regional level." 45 Fed. Reg. 33,290, 33,412 (1980); *see Env'tl. Disposal Sys.*, 12 E.A.D. at 263-64; *In re Puna Geothermal Venture*, 9 E.A.D. 243, 246 (EAB 2000); *see also Presidium Energy*, UIC Appeal No. 09-01 at 2 n.4. The Board has repeatedly confirmed this interpretation of its discretionary authority to grant review of permit actions. *See, e.g., In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567 (EAB 1998) (citing *In re Federated Oil & Gas of Traverse City, Michigan*, 6 E.A.D. 722, 725 (EAB 1997)); *Cherry Berry*, UIC Appeal No. 09-02 at 1 n.2; *Palmdale*, slip op. at 8. "On matters that are fundamentally technical or scientific in nature, the Board will typically defer to a permit issuer's technical expertise and experience, as long as the permit issuer adequately explains its rationale and supports its reasoning in the administrative record." *City of Palmdale*, slip op. at 9 (citing *Dominion I*, 12 E.A.D. at 510).

Additionally, in appealing a UIC permit decision, a petitioner may only raise issues that fall within the scope of UIC permit review:

The UIC permitting process is narrow in its focus and the Board's review of UIC permit decisions extends only to the boundaries of the UIC permitting program, which is limited to the protection of underground sources of drinking water. *See In re Environmental Disposal Systems, Inc.*, 12 E.A.D. 254, 266 (EAB 2005); *In re American Soda, LLP*, 9 E.A.D. 280, 286 (EAB 2000) ("the SDWA . . . and the UIC regulations . . . establish the only criteria that EPA may use in deciding

whether to grant or deny an application for a UIC permit”); *NE Hub Partners, L.P.*, 7 E.A.D. 561, 567 (“protection of interests outside of the UIC program [is] beyond our authority to review in the context of [a UIC] case”); *In re Brine Disposal Well*, 4 E.A.D. 736, 742 (EAB 1993) (“parties objecting to a federally issued UIC permit must base their objections on the criteria set forth in the [SDWA] and its implementing regulations.”). [*Presidium Energy*, UIC Appeal No. 09-01 at 4 n. 5]

#### IV. ARGUMENT

As explained in greater detail below, the Petition makes multiple arguments, all of which fail to meet threshold standards in that they variously: 1) fail to identify a specific permit condition for review; 2) fail to indicate Petitioner’s participation in public comment and demonstrate that the conditions for review raised in the Petition were raised during the public comment period; 3) raise a novel argument on appeal; 4) fail to address Region 5’s responses to Petitioner’s specific comments and explain why those comments are inadequate; and 5) seek review of issues outside the boundaries of the UIC permitting program. Further, should the Board evaluate any of Petitioner’s arguments regardless of the above deficiencies, enough information exists on the existing administrative record to conclude that each of these arguments is without merit. Petitioner thereby fails to meet the threshold procedural burden or his burden on merit of demonstrating that EPA’s decision was based on a clearly erroneous finding of fact or conclusion of law, or included an exercise of discretion or an important policy consideration which the Board should, in its discretion, review, as required by 40 C.F.R. 124.19(a).

**A. Petitioner's Argument Regarding the Indiana Bat Fails to Meet Threshold Pleading Requirements and Therefore the Board Should Dismiss the Petition As Regards That Argument**

Petitioner raises an unclear argument regarding the Indiana bat, an endangered species.

This argument fails to meet threshold pleading requirements, in that it fails to either 1) identify specific permit conditions for review; or 2) indicate Petitioner's participation in public comment and demonstrate that the conditions for review raised in the petition were raised during the public comment period. Some of Petitioner's argument purports to address Region 5's responses to comments regarding the Indiana bat. But because Petitioner made no specific argument regarding the Indiana bat during the comment period, Petitioner's contentions regarding the bat bear no connection to any argument that Petitioner raised during public comment. Additionally, Petitioner seeks Board review of concerns outside the boundaries of the UIC permitting program, which is limited to the protection of USDW. Individually, each of these flaws is fatal to Petitioner's appeal. Finally, even if the Board were to review Petitioner's argument on its merits, under the Board's standard of deference and review Petitioner does not establish that the permit either: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

**1. Procedural history**

During the public comment period, Petitioner made the following comment regarding the Indiana bat: "I'd also like the EPA to take notice of the Indiana bat is [sic] in this area, and that they must be respected because they're on the Federal Endangered list." Att. B-6, hearing transcript, p. 19.

Region 5 responded to this and other comments regarding impacts on endangered species. Relevant portions of Region 5's response to comments regarding endangered species are:

The purpose of the UIC program is to protect USDWs from being contaminated by underground injection practices. The geologic siting of the proposed well and its proposed construction and operation are sufficient to prevent upward movement of the injected fluid into USDWs. Because injection in West Bay #22 will not affect the USDW, injected fluid will not affect wildlife and threatened and endangered species . . . .

EPA determined that the immediate well area does not provide the habitat for these species. Briefly, the Indiana bat uses river corridors, woodlands and caves or mines; . . . The area around the well is farmland, which generally provides no habitat for these species. Nearby water bodies and wetlands in the surrounding farmland and in the county will not be affected by the well. Therefore, the well will not have an adverse effect on threatened and endangered species . . . .

Surface activities at the well site may affect wildlife and general wildlife habitat, however. MDEQ regulates surface activities, such as pad construction, waste storage, and waste transportation, and surface runoff. Truck traffic and roads may be regulated by MDEQ and the Michigan Department of Transportation. Concerns about these activities should be directed to MDEQ (see contact information in Response 7). [Att. B-7, response 8.]

On appeal, Petitioner appears to argue that the Indiana bat may in fact use the injection site footprint as habitat and that bats roosting there could be exposed to toxic chemicals via site chemical spills. As illustrated above in this section, Petitioner did not previously raise this argument.

**2. The Board should dismiss the Petition as regards Petitioner's Indiana bat argument, for failure to meet threshold standards**

Like Petitioner's comments during public comment regarding the Indiana bat, Petitioner's argument on appeal identifies no specific permit condition for review. On this ground alone, the Board should deny the Petition. *Cherry Berry*, UIC Appeal No. 09-02 at 3-4; *Presidium Energy*, UIC Appeal No. 09-01 at 4-5.

Petitioner's appeal regarding the Indiana bat also fails to indicate Petitioner's participation in public comment and demonstrate that the conditions for review raised in the

Petition were raised during the public comment period.<sup>5</sup> Nor could Petitioner make this showing, because as shown in the preceding section, Petitioner advanced no specific argument regarding the Indiana bat during public comment. Petitioner's argument regarding the Indiana bat during public comment was a general statement of concern. Petitioner attempts to raise a novel argument during his appeal. For failing to demonstrate that the conditions for review raised in the Petition were raised during the public comment period, the Board should also deny the Petition. *Cherry Berry*, UIC Appeal No. 09-02 at 2; *Presidium Energy*, UIC Appeal No. 09-01 at 3-5.

A portion of Petitioner's argument on appeal does address Region 5's responses to comments regarding the Indiana bat. Specifically, Petitioner disputes Region 5's contention that the injection site footprint is not Indiana bat habitat. But because Petitioner made no specific argument regarding the Indiana bat during public comment and certainly did not argue that the Indiana bat would roost at the site, Petitioner's attack bears no connection to any argument that Petitioner raised during public comment. For failing to address Region 5's responses to Petitioner's specific comments and explain why those responses are inadequate, the Board should also deny the Petition. *Cherry Berry*, UIC Appeal No. 09-02 at 5; *Presidium Energy*, UIC Appeal No. 09-01 at 4-5.

Additionally, Petitioner's argument on appeal seeks review of issues outside the boundaries of the UIC permitting program. The only harm to the Indiana bat that Petitioner articulates on appeal is exposure to toxic chemicals at the injection site via site chemical spills. However, the UIC permitting program does not have authority over chemical spills. The UIC

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<sup>5</sup> The Petition states at p. 1 that Petitioner participated in public comment, but provides no information regarding Petitioner's arguments during public comment.



permitting program focuses instead on the protection of USDW, which is as far as Region 5's authority extends in UIC permitting decisions. *See* UIC permitting criteria at 40 C.F.R. §§ 144.31, 146.24.

As shown in the preceding section, during its response to comments, Region 5 pointed out that concerns regarding surface activities at the injection site are outside the scope of permit review. Region 5 stated that concerns regarding topics like waste storage and surface runoff should be addressed to the Michigan Department of Environmental Quality, which regulates such activities. Att. B-7, response 8; *see also* Att. B-7, responses 78 and 80. Because Petitioner only seeks review of issues outside the boundaries of the UIC permitting program, the Board should also deny the Petition. *Presidium Energy*, UIC Appeal No. 09-01 at 4, n. 5.

**B. Petitioner's Argument Regarding the Indiana Bat Fail On Its Merits and Therefore Even Were the Board to Evaluate That Argument, the Board Should Dismiss the Petition As Regards That Argument**

Even if the Board chose to evaluate Petitioner's argument regarding the Indiana bat on its merits, that argument fails to establish either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a). In a sense Region 5 cannot address this argument on its merits, as it calls for Region 5 to address concerns beyond how the injections may affect endangered species. Region 5 is also severely disadvantaged in doing so, because Petitioner did not raise this argument during public comment and Region 5 accordingly had no chance to develop the administrative record to address it. But based on its existing review of Indiana bat issues, Region 5 can point out fatal error in Respondent's argument.

When fulfilling its responsibilities under the Endangered Species Act, 16 U.S.C. §§ 1531 et seq. (“ESA”), in the context of a UIC permitting decision, Region 5 evaluates whether any EPA-authorized activity will affect endangered species in any way. In the course of performing its review, Region 5 evaluated whether the injection site footprint occupied endangered species habitat.

As Region 5 stated in its response to comments, the Indiana bat roosts in river corridors, woodlands, caves and mines. Att. B-7, response 8. Specifically, the Indiana bat hibernates in caves and abandoned mines in the winter and roosts in forests and forested river corridors in the summer. Att. B-9. The injection site footprint is out in an agricultural field, some distance from any forested area. Att. B-9. Petitioner’s argument that the Indiana bat would roost at the injection site is therefore not consistent with the administrative record. Nor has Petitioner entered any additional facts or evidence into the administrative record to prove otherwise, either through his comments or his appeal.

ESA determinations are fundamentally technical and scientific in nature. The U.S. Fish & Wildlife Service (“FWS”) is the federal agency that implements the ESA. Region 5 used FWS information in making its determination. Att. B-9. Additionally Region 5 has experience of its own in making ESA determinations, having permitted over 1,460 UIC wells in Michigan alone over the past few decades. Att. B-7, response 55. On matters that are fundamentally technical or scientific in nature, the Board will typically defer to a permit issuer’s technical expertise and experience, as long as the permit issuer adequately explains its rationale and supports its reasoning in the administrative record. *City of Palmdale*, slip op. at 9 (citing *Dominion I*, 12 E.A.D. at 510). Region 5 developed an administrative record on the subject of

Indiana bat habitat; and in that record and the response to comments adequately explained EPA's technical and scientific rationale and supported its reasoning. Atts. B-7, response 8; B-9.

Additionally the Board has stated its belief that its power of review "should only be sparingly exercised," and that "most permit conditions should be finally determined at the Regional level;" 45 Fed. Reg. 33,290, 33,412 (1980); *see Env'tl. Disposal Sys.*, 12 E.A.D. at 263-64; *Puna Geothermal Venture*, 9 E.A.D. at 246; *see also Presidium Energy*, UIC Appeal No. 09-01 at 2 n.4. Because Region 5 has applied its technical and scientific expertise to a technical and scientific matter; and because Region 5 has adequately explained its rationale and supported its reasoning in the administrative record, the Board should reject Respondent's argument even if it were to consider it on its merits.

Petitioner's argument also fails on its merits because it has no support in real-world fact. The articles that Petitioner cites in his appeal do not appear to contradict Region 5's conclusion and do not support Petitioner's argument.<sup>6</sup> *E.g.*, Kurta and Whitaker, 1998, *Diet of the Endangered Indiana Bat (Myotis sodalis) On the Northern Edge of Its Range*, *The American Midland Naturalist* 140, pp. 280-286 (observing that in Michigan, the Indiana bat mainly eats aquatic insects; the injection site footprint is not a forested river corridor or other aquatic environment). The Indiana bat may roost in forested portions of a generally agricultural area. But Petitioner has cited no article indicating that Indiana bats roost in open agricultural fields, while one article that Petitioner cited found that Indiana bats will not even feed over open fields. Murray and Kurta, 2001, *Nocturnal Activity of Endangered Indiana Bat (Myotis sodalis)*, *Journal of Zoology* 262, pp. 197-206 (observing that Indiana bats travel along wooded corridors

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<sup>6</sup> None of the articles that Petitioner cites on appeal regarding the Indiana bat appear in the administrative record. Petitioner did not cite any of these articles during public comment.

during night feeding and did not fly over open fields).

Petitioner's articles agree with Region 5's position that the Indiana bat roosts in trees, which are absent at the injection site footprint.<sup>7</sup> This also agrees with the information that Region 5 gathered in Att. B-9, from sources including FWS. Petitioner appears to have misconstrued or misrepresented basic information about the Indiana bat. Therefore Petitioner has not met his burden of establishing either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

**C. Petitioner's Arguments Regarding Injectate Migration Fail to Meet Threshold Pleading Requirements and Therefore the Board Should Dismiss the Petition As Regards Those Arguments**

The Petition raises multiple arguments to the effect that the injectate will dissolve its confining layer and contaminate a USDW. Petitioner raised two such arguments during public comment that he now pursues on appeal. Additionally Petitioner raises six more arguments for the first time in the Petition. The Petition indicates that Petitioner participated in public comment, though it provides no details regarding that participation. At a minimum all of Petitioner's injectate arguments fail to meet threshold pleading requirements, in that they fail to either: 1) identify specific permit conditions for review; or 2) demonstrate that the conditions for

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<sup>7</sup> See Kurta et al., 1993, *A Maternity Roost of the Endangered Indiana Bat (Myotis sodalis) In an Unshaded, Hollow, Sycamore Tree (Platanus occidentalis)*, The American Midland Naturalist 130, pp. 405-407 (examines the Indiana bat's preference for shaded roost trees); Kurta, et al., 1993, *Summer Roosts of the Endangered Indiana Bat (Myotis sodalis) On the Northern Edge of Its Range*, The American Midland Naturalist 129, pp. 132-138 (describes a community of Indiana bats roosting in trees in Michigan); Kurta et al., 1996, *Ecological, Behavioral, and Thermal Observations of a Peripheral Population of Indiana Bats (Myotis sodalis)*, in *Bats and Forests*, Barclay, R. M. R. and Brigham, R. M., eds., Victoria BC: Ministry of Forests Research Program (observing that Indiana bats prefer roosts in dead and dying trees).

review raised in the petition were raised during the public comment period. Some of Petitioner's arguments on appeal attack Region 5's responses to comments regarding injectate contamination. But some of Petitioner's arguments were never raised during public comment. Additionally, at least one argument advanced by Petitioner seeks Board review of concerns outside the boundaries of the UIC permitting program, which is limited to the protection of USDW. Individually, each of these flaws is fatal to Petitioner's appeal. Finally, even if the Board were to review Petitioner's argument on its merits, under the Board's standard of deference and review Petitioner does not establish that the permit either: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

**1. Procedural history**

During the public comment period, Petitioner made the following arguments regarding injectate migration:

- 1) The injectate will contaminate a USDW, because the confining zone is composed of a material that will dissolve upon contact with the injectate. Att. B-6, hearing transcript. pp. 19-20.
- 2) The confining zone will dissolve upon contact with the injectate more rapidly than otherwise, because the injectate contains salts which will increase the reaction. Att. B-6, email.

Region 5 addressed these and other comments regarding injectate migration. Relevant portions of Region 5's response to comments regarding injectate migration occur at responses 1, 2, 4, 31, 34, 39 and 55. Region 5 will excerpt portions of those responses as relevant below.

On appeal, Petitioner raises the following arguments:

- 1) The injectate will contaminate a USDW, because the confining zone is composed of a material

that will dissolve upon contact with the injectate. Att. B-1, pp. 3-4. Petitioner raised this argument during public comment.

2) The confining zone will dissolve upon contact with the injectate more rapidly than otherwise, because the injectate contains salts which will increase the reaction. Petitioner raised this argument during public comment. Att. B-1, pp. 4-5.

3) The injectate will contaminate a USDW, because as the confining zone dissolves upon contact with the injectate it will swell. This swelling will cause the confining zone to fracture, which will create additional avenues for upward injectate migration. Petitioner raises this argument for the first time in the Petition. Att. B-1, p. 5.

4) The injectate will contaminate a USDW, because the injectate will migrate upward through “pre-existing fractures” in the rock strata. Att. B-1, p. 6. Petitioner raises this argument for the first time in the Petition.

5) The injectate will contaminate a USDW, because Michigan groundwater naturally migrates upward and so the injectate will migrate upward. Att. B-1, p. 6. Petitioner raises this argument for the first time in the Petition.

6) The injectate will contaminate a USDW, because it is being injected under pressure and that pressure will push the injectate upward. Att. B-1, pp. 5-6. Petitioner raises this argument for the first time in the Petition.

7) The injectate will contaminate a USDW, because none of the strata overlying the injection zone are impermeable. Att. B-1, p. 6. Petitioner raises this argument for the first time in the Petition.

8) Region 5 should model how the injectate will behave upon injection. Att. B-1, pp. 3-4.

Petitioner raises this argument for the first time in the Petition.

**2. The Board should dismiss the Petition as regards Petitioner's arguments regarding injectate migration, for failure to meet threshold standards**

Like Petitioner's comments during public comment regarding injectate migration, none of Petitioner's arguments on appeal identify a specific permit condition for review. On this ground alone, the Board should deny the Petition. *Cherry Berry*, UIC Appeal No. 09-02 at 3-4; *Presidium Energy*, UIC Appeal No. 09-01 at 4-5.

Petitioner's appeal regarding injectate migration also fails to indicate Petitioner's participation in public comment and demonstrate that the conditions for review raised in the Petition were raised during the public comment period.<sup>8</sup> Nor could Petitioner make this showing for any arguments besides arguments 1 and 2, because Petitioner did not advance arguments 3 through 8 during public comment. Petitioner attempts to raise arguments 3 through 8 as issues of first impression during his appeal. For failing to demonstrate that the conditions for review raised in the Petition were raised during the public comment period, the Board should also deny the Petition as regards Petitioner's arguments 3 through 8. *Cherry Berry*, UIC Appeal No. 09-02 at 2; *Presidium Energy*, UIC Appeal No. 09-01 at 3-5. And as the Board has recognized, disposing of at least arguments 3 through 8 in this way protects the integrity of the permitting process by giving some finality to the permitting process. *Presidium Energy*, UIC Appeal No. 09-01 at 2, n.3. The alternative to upholding the UIC appeal regulations is a never-ending process of comment and response.

Petitioner generally frames his arguments on appeal regarding injectate migration as attacks on Region 5's responses to comments, specifically responses 1 and 34. But because

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<sup>8</sup> The Petition states at p. 1 that Petitioner participated in public comment, but fails to specify Petitioner's arguments during public comment.

Petitioner's arguments 3 through 8 appear for the first time in Petitioner's appeal, those arguments bear no connection to any argument that Petitioner raised during public comment. For failing to address Region 5's responses to Petitioner's specific comments and explain why those responses are inadequate regarding the specific comments, the Board should also deny the Petition as regards arguments 3 through 8. *Cherry Berry*, UIC Appeal No. 09-02 at 5; *Presidium Energy*, UIC Appeal No. 09-01 at 4-5.

Additionally, Petitioner's argument 8 seeks review of issues outside the boundaries of the UIC permitting program. This argument appears at pp. 3-4 of the Petition, where to the extent that the argument is discernible Petitioner appears to argue that Region 5 should determine temperature and pressure interactions in the injection zone or confining zone or both and model how the injectate will interact with the confining zone. But "[t]he UIC permitting process is narrowly focused, with the SDWA statutory provisions and the UIC regulations establishing the only criteria a Region may use to decide whether to issue a permit." *Cherry Berry*, UIC Appeal No. 09-02 at 3, n. 4 (citing *American Soda*, 9 E.A.D. at 289; and *NE Hub Partners*, 7 E.A.D. at 567). The regulations at 40 C.F.R. §§ 144.31 and 146.24 set forth the only criteria and information that Region 5 may consider in issuing a Class II UIC permit. Those regulations do not require prospective permittees to undergo Region 5 modeling before getting a Class II UIC permit. Because Petitioner seeks review of issues outside the boundaries of the UIC permitting program, the Board should deny the Petition as regards Petitioner's argument 8. *Presidium Energy*, UIC Appeal No. 09-01 at 4, n.5; see also Att. B-7, response 52.



**D. Petitioner's Arguments Regarding Injectate Migration Fail On Their Merits and Therefore Even Were the Board to Evaluate Those Arguments, the Board Should Dismiss the Petition As Regards Those Arguments**

Even if the Board chose to evaluate Petitioner's arguments regarding injectate on their merits, those arguments fail to establish either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a). Petitioner's arguments may have some interrelation, but not enough to trigger review. Region 5 will address Petitioner's arguments separately below.

**1. Petitioner's argument 1, that the injectate will contaminate a USDW because the confining zone is composed of a material that will dissolve upon contact with the injectate, fails on its merits and therefore even were the Board to evaluate this argument, the Board should dismiss the Petition as regards this argument**

At p. 4 of his Petition, Petitioner refers to his argument during public comment that anhydrite converts to gypsum upon contact with water; the confining zone is anhydrite; gypsum is porous; and that therefore the injectate will convert the confining zone into gypsum, then dissolve or otherwise work its way through that confining layer. *See* Att. B-6, transcript pp. 19-20 and email. This argument fails to establish either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a). Therefore even were the Board to evaluate this argument, the Board should dismiss the Petition as regards this argument.

First, this argument fails because it is simply irrelevant. Even if the injectate somehow penetrated through the confining zone, that event would not call the permit into question. Petitioner misunderstands how EPA permits regulate UIC injections.

The UIC regulations in general, and the UIC permitting process specifically, are designed to protect USDWs. Region 5 issues a UIC Class II permit as long as the permitted injection will not result in contamination of a USDW. In considering whether a Class II permitted injection will contaminate a USDW, Region 5 must evaluate all of the formations overlying the injection zone, not just the formation(s) comprising the confining zone. For any UIC Class II permit that Region 5 has issued, Region 5 has determined that the injection cannot penetrate all of the formations overlying the injection zone to contaminate a USDW. Penetration of the confining zone need not call the permit into question, unless the confining zone is the only formation between the injection zone and a USDW.

As Region 5 stated in its response to comments, multiple impermeable formations overlie the 2,436 feet between the top of the injection zone and the bottom of the relevant USDW. These impermeable formations appear in the formation records for another area well, as various layers of anhydrites and shales. Att. B-2, Attachment L and Appendix 4. Region 5 UIC permitting officials have a wide-ranging knowledge of Michigan stratigraphy and can interpret the formation records using that in-depth knowledge. See Att. B-7, response 2 (noting Region 5's decades of experience regulating Class II UIC wells); response 31 (articulating Region 5's extensive experience with Michigan geology and UIC well regulation in Michigan); and response 55 ("EPA Region 5 has managed the Michigan Class II permit program since 1984 and has permitted at least 1,460 Class II wells in the State, about 1,300 of which are disposal

wells.”). And using its scientific and technical judgment, Region 5 determined that even if the West Bay injectate somehow penetrated the confining zone, it would not contaminate a USDW:

**The top of the injection zone is separated from the bottom of the USDW by approximately 2436 feet of rock formations [sic] layers . . . many of the rock layers between the confining zone and the base of the USDW are impermeable shales and evaporites which will prevent injection fluid from moving upward to enter the USDW. [Att. B-7, response 1; emphasis added]**

\* \* \*

**No one can guarantee that injected fluid will not leave the injection zone. The purpose of the UIC program is to protect USDWs from being contaminated by underground injection practices.** The construction, operation, and geological siting criteria, which prevent USDW contamination, do so in part by requiring the fluid to be injected into zones that will accept and retain the fluid and be underneath formations that will prevent the fluid from moving into USDWs.

If injected fluid were to exit the confining zone, it would migrate up into the next rock unit capable of accepting fluid. At the West Bay #22 site, the injection zone is separated from the lowest USDW by 2436 feet of geologic strata. **Aside from the confining zone, many of the formations between the injection zone and the USDW are layered with impermeable shale and other rock types which will prevent movement of the injected fluid into the USDW. [Att. B-7, response 4; emphasis added]**

\* \* \*

Michigan geology is well-documented and existing information is sufficient to make a permitting decision for this well. EPA uses technical studies of the geology of Michigan (such as The Hydrogeologic Atlas of Michigan). Michigan geology is relatively consistent across the state, and we have data from hundreds of Michigan wells that have been permitted by our office, as well. In addition, we reviewed geologic data in driller’s logs or formation records from nearby wells. All the information we have indicates the injection zone is capable of receiving injected brine and that **the confining zone and overlying strata will effectively prevent injected fluid from contaminating USDWs. [Att. B-7, response 31; emphasis added]**

\* \* \*

Finally, lithologic composition of the confining zone would not automatically disqualify the geologic siting of the West Bay #22 well. If brine fluid were to interact with the Salina A-2 Evaporite layer and somehow breach the confining zone, fluid would migrate up into the next rock unit that would accept fluid. **The injection zone is separated from the lowest USDW by 2436 feet of geologic strata. Many of the formations between the injection zone and the USDW are layered with impermeable shale and other rock types which will also prevent movement of the injected fluid into the USDW. The geology at the well site is sufficient to prevent upward movement of the injected fluid into USDWs.** [Att. B-7, response 34]

Thus even if Petitioner's argument were correct that injectate would penetrate upward through the confining zone, Region 5 in its scientific and technical judgment determined that the additional formations overlying the injection zone would prevent contamination of the USDW.<sup>9</sup> Injection siting evaluations are fundamentally technical and scientific in nature. On matters that are fundamentally technical or scientific in nature, the Board will typically defer to a permit issuer's technical expertise and experience, as long as the permit issuer adequately explains its rationale and supports its reasoning in the administrative record. *City of Palmdale*, slip op. at 9 (citing *Dominion I*, 12 E.A.D. at 510). Region 5 applied its technical expertise to the injection siting in this matter; developed an administrative record on the subject; and in that record and the response to comments adequately explained its rationale and supported its reasoning. Att. B-7, responses 1, 4, 31, 34. Additionally the Board has stated its belief that its power of review "should only be sparingly exercised," and that "most permit conditions should be finally determined at the Regional level." 45 Fed. Reg. 33,290, 33,412 (1980); see *Envtl. Disposal Sys.*,

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<sup>9</sup> In this context, it is worth noting that even if the injectate were to migrate upward into an overlying formation, it might never reach the Salina A-2 Evaporite confining zone because there are even formations between the injection zone and the Salina A-2 Evaporite. While the permittee requested an injection zone consisting of the Niagara Group, Salina A-1 Evaporite and Cain Formation, Region 5 only permitted injections into the Niagara Group. Att. B-2, Att. G, p. 3 of 8; Att. B-8. This left the Salina A-1 Evaporite and Cain Formation as de facto confining zones between the injection zone and the actual confining zone of the Salina A-2 Evaporite. Any injectate migrating upward from the Niagara Group could be blocked by these intervening formations.

12 E.A.D. at 263-64; *Puna Geothermal Venture*, 9 E.A.D. at 246; see also *Presidium Energy*, UIC Appeal No. 09-01 at 2 n.4. Because Region 5 has applied its technical and scientific expertise to a technical and scientific matter; and because Region 5 has adequately explained its rationale and supported its reasoning in the administrative record, the Board should reject Respondent's argument 1 even if the Board were to consider it on its merits.

Second, Petitioner's basic premise also fails on its merits because it has no support in real-world fact. The articles that Petitioner cited during public comment neither contradict Region 5's conclusion nor appear to support Petitioner's argument that the injectate could dissolve the entire Salina A-2 Evaporite. In certain circumstances at shallow depths and on the earth's surface, anhydrite immersed in water can convert to gypsum. But nothing in Petitioner's studies cited during public comment supports the belief that at the temperatures and pressures of over 2,600 feet water could dissolve 28 feet of dense crystalline anhydrite. Petitioner did not supply Region 5 with any of the articles that he cited during public comment. However, in responding to public comment Region 5 was able to locate six of Petitioner's cited articles and stated the following:<sup>10</sup>

The papers cited by the commenter concern mineral reactions in situations that are not analogous or relevant to the Salina A-2 Evaporite below the well site. For example, several cited papers dealt with experiments that investigate chemical reactions at surface conditions or evaluate anhydrite as it is used in cement and concrete. Other papers are concerned with investigating the formational origin of evaporite minerals, not their behavior at depth with respect to fluids. Such work is not relevant to gauging the behavior of the Salina A-2 Evaporite layer at approximately 2630 feet below the surface, where the pressure and temperature regime is much different and influences mineral reactions and rock behavior.

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<sup>10</sup> Petitioner's citations were incomplete, consisting only of a name and year. Att. B-6, email. Region 5 did its best to locate the cited articles nonetheless. Region 5 placed the six articles that it found in the administrative record. See Atts. B-10 through B-15.

Another cited paper describes anhydrite zone failure beneath a town in Germany. The paper attributes the 2007 event to the drilling of geothermal heat exchange boreholes into an anhydrite layer approximately 195 feet below the surface. The situation described in this paper is not relevant to the permit decision, because the geologic setting of the German town is very different from the geologic regime at the West Bay #22 site, and geothermal heat exchange technology is different than Class II injection well technology. [Att. B-7, response 34; paragraph break added]

Thus Region 5 considered and addressed what studies it could find underlying Petitioner's argument. Region 5 may now expand on inappropriateness of Petitioner's cited articles to the actual facts of West Bay 22 SWD.

Conley and Bundy, 1958, *Mechanism of Gypsification*, *Geochimica et Cosmochimica Acta*, v. 15, discusses how gypsum may have formed during the evaporation of ancient seas as anhydrite particles settled to the sea bottom to form ocean sediments. Att. B-10. From a technical and scientific perspective, these processes have no bearing on interactions with dense geologic formations at great depth. And the article nowhere suggests that at a depth of over 2,600 feet water could dissolve 28 feet of dense crystalline anhydrite.

Hardie, 1967, *The Gypsum Anhydrite Equilibrium at One Atmosphere Pressure*, *The American Mineralogist*, Vol. 52, January-February, discusses the deposition of anhydrite and gypsum at surface pressures and temperatures, specifically to investigate whether gypsum in rock strata today was originally deposited at the surface as anhydrite or gypsum. Att. B-11. The article does not address mineral reactions at depth and nowhere suggests that that at a depth of over 2,600 feet water could dissolve 28 feet of dense crystalline anhydrite.

Murray, 1964, *Origin and Diagenesis of Gypsum and Anhydrite*, *Journal of Sedimentary Petrology*, Vol. 34, No. 3, discusses the diagenesis of gypsum and anhydrite. Att. B-12. Diagenesis is a process that freshly deposited, loose grains of sediment go through and includes

the lithification process whereby such sediments become actual rock. As diagenesis occurs near the surface, temperatures and pressures involved are relatively low. The article suggests that anhydrite brought near the surface might become gypsum. The article does not address mineral reactions among already-lithified formations, like the Salina A-2 Evaporite. The article does not address mineral reactions at depth and nowhere suggests that that at a depth of over 2,600 feet water could dissolve 28 feet of dense crystalline anhydrite.

Ogniben, 1955, *Inverse Graded Bedding in Primary Gypsum of Chemical Deposition*, Journal of Sedimentary Petrology, Vol. 25, No. 4, pp. 273-281, describes how alternating layers of anhydrite and gypsum were deposited during the evaporation of ancient seas and interprets what those cycles might indicate regarding ancient climate cycles. Att. B-13. The article does not address mineral reactions at depth and nowhere suggests that that at a depth of over 2,600 feet water could dissolve 28 feet of dense crystalline anhydrite.

Sass & Burbaum, 2010, *Damage To the Historic Town of Staufen (Germany) Caused by Geothermal Drillings Through Anhydrite-Bearing Formations*, ACTA Carsologica, 39/2 Postonjna, discusses how geothermal drillings at shallow geologic depth in a German town triggered earth cracking and rising. Att. B-14. The article theorized that the earth disturbances occurred following the geothermal drillings due to a complex confluence of factors, including artesian groundwater; karst formations; anhydrite at a depth of around 200 feet<sup>11</sup> that could hydrate and swell because there was insufficient pressure from overburden rock, i.e. because the anhydrite was too close to the surface; and tectonic activity. The West Bay 22 well does not involve geothermal heat-exchange wells, does not involve water flowing through an anhydrite

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<sup>11</sup> The deepest heat-exchange borehole reached about 460 feet underground, but the anhydrite at issue was only about 200 feet deep. Att. B-14, p. 237, table 9.

formation through boreholes; and lacks the other geologic factors present at the German town. The article presents only a case study of one location unrelated to the instant well; does not address mineral reactions at depth; and nowhere suggests that that at a depth of over 2,600 feet water could dissolve 28 feet of dense crystalline anhydrite.

Sievert, Wolter and Singh, 2005, *Hydration of Anhydrite of Gypsum (CaSO<sub>4</sub>.II) in a Ball Mill*, Cement and Concrete Research, Vol. 35, pp. 623-630, discusses using anhydrite as an industrial material and does not address geologic processes at all.<sup>12</sup> Att. B-15.

Overall, Petitioner appears to have constructed his argument by misconstruing or misrepresenting basic information about anhydrite conversion to gypsum at or near the Earth's surface. Therefore Petitioner has not met his burden of establishing either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

**2. Petitioner's argument 2, that the confining zone will dissolve upon contact with the injectate more rapidly than otherwise because the injectate contains salts which will increase the reaction, fails on its merits and therefore even were the Board to evaluate this argument, the Board should dismiss the Petition as regards this argument**

At pp. 4-5 of his Petition, Petitioner refers to his argument during public comment that the confining zone will dissolve upon contact with the injectate more rapidly than otherwise because the injectate contains salts which will increase the reaction. *See* Att. B-6, email. This argument fails to establish either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy

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<sup>12</sup> During public comment, Petitioner cited an article as simply "Singh, 2004." Att. B-6, email. The instant article is from 2005 and may not be the article that Petitioner indicated. Region 5 has done the best it can to locate and respond to Petitioner's articles, given Petitioner's citations.



consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

Therefore, even were the Board to evaluate this argument, the Board should dismiss the Petition as regards this argument.

Like Petitioner's argument 1, this argument fails on its merits because it is simply irrelevant. As discussed in the preceding section, Region 5 evaluates the sufficiency of a UIC permit application by whether the proposed injection fluid will reach a USDW. Even if Petitioner's argument were correct that injectate would migrate upward through the confining zone, Region 5 in its scientific and technical judgment determined that the additional formations overlying the injection zone would prevent contamination of the USDW.

Again, injection siting evaluations are fundamentally technical and scientific in nature. On matters that are fundamentally technical or scientific in nature, the Board will typically defer to a permit issuer's technical expertise and experience, as long as the permit issuer adequately explains its rationale and supports its reasoning in the administrative record. *City of Palmdale*, slip op. at 9 (citing *Dominion I*, 12 E.A.D. at 510). Region 5 applied its technical expertise to the injection siting in this matter; developed an administrative record on the subject; and in that record and the response to comments adequately explained its rationale and supported its reasoning. Att. B-7, responses 1, 4, 31, 34. Additionally the Board has stated its belief that its power of review "should only be sparingly exercised," and that "most permit conditions should be finally determined at the Regional level;" 45 Fed. Reg. 33,290, 33,412 (1980); see *Envtl. Disposal Sys.*, 12 E.A.D. at 263-64; *Puna Geothermal Venture*, 9 E.A.D. at 246; see also *Presidium Energy*, UIC Appeal No. 09-01 at 2 n.4. Because Respondent's argument regarding the injectate migration fails on its merits; because Region 5 has applied its technical and

scientific expertise to a technical and scientific matter; and because Region 5 has adequately explained its rationale and supported its reasoning in the administrative record, the Board should reject Respondent's argument 2 even if the Board were to consider it on its merits.

Two of the three articles that Petitioner cites on appeal in support of argument 2 he appears to have cited during public comment. Atts. B-10, B-11. Region 5 discussed these articles in the preceding section. These articles, and the studies they represent, neither contradict Region 5's conclusion, nor support Petitioner's argument that the salts content in the injectate will allow the injectate to penetrate the Salina A-2 Evaporite.

The third article that Petitioner cites is Singh, 2005, *The Activation Effect of  $K_2SO_4$  on the Hydration of Gypsum Anhydrite,  $Ca SO_4 (II)$* , Journal of the American Ceramics Society, 88, pp. 196-201.<sup>13</sup> This article investigates the effect of  $K_2SO_4$  on hydration of anhydrite and contemplates that an intermediary compound enhances hydration in such a way that increases end product strength and decreases total porosity with the degree of hydration. This article details experiments in surface rehydration of anhydrite and does not claim to address subsurface anhydrite hydration. For example, this article does not account for the effects of overburden pressure on hydration reactions. This article also does not state that oil production brines are analogous to  $K_2SO_4$ , or draw any conclusions as to how oil production brines interact with anhydrite, either above ground or underground.

As with Petitioner's argument 1, Petitioner appears to have constructed his argument 2 by misconstruing or misrepresenting basic information about anhydrite conversion to gypsum at or near the Earth's surface. Therefore Petitioner has not met his burden of establishing either that

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<sup>13</sup> This article does not appear in the administrative record. Petitioner did not cite this article during public comment.

the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

3. **Petitioner's argument 3, that the injectate will contaminate a USDW because the confining zone will swell and fracture upon converting to gypsum and create conduits through the confining zone, fails on its merits and therefore even were the Board to evaluate this argument, the Board should dismiss the Petition as regards this argument**

At p. 5 of his Petition, Petitioner argues that the injectate will contaminate a USDW because the confining zone will swell and fracture upon converting to gypsum and create conduits through the confining zone. This argument fails to establish either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a). Therefore even were the Board to evaluate this argument not raised during public comment, the Board should dismiss the Petition as regards this argument.

Region 5 is severely handicapped in discussing Petitioner's argument 3, because Petitioner did not raise this argument during public comment and Region 5 accordingly had no chance to develop the administrative record to address it. But based on its existing review of public comments, Region 5 can point out fatal error in Respondent's argument.

Like Petitioner's arguments 1 and 2, Petitioner's argument 3 fails on its merits because it is simply irrelevant. As discussed in the preceding sections regarding Petitioner's arguments 1 and 2, Region 5 evaluates the sufficiency of a UIC permit application by whether that injection will reach a USDW. Even if Petitioner's argument were correct that injectate would migrate upward through the confining zone, Region 5 in its scientific and technical judgment determined

that the additional formations overlying the injection zone would prevent contamination of the USDW. Region 5 also stated the following in its response to public comment:

The permit limits injection pressure to prevent the injected fluid from causing fractures in the rock, which could become conduits for the injected fluid to leave the injection zone. In this case, the permit limits the surface injection to 682 pounds per square inch, which EPA calculated using site-specific but conservative figures for waste and rock characteristics. [Att. B-7, response 2; *see also* Att. B-7, response 39]

Because Respondent's argument regarding the injectate migration fails on its merits; because Region 5 has applied its technical and scientific expertise to a technical and scientific matter; and because Region 5 has adequately explained its rationale and supported its reasoning in the administrative record, the Board should reject Respondent's argument 3 even if the Board were to consider it on its merits. *City of Palmdale*, slip op. at 9 (citing *Dominion I*, 12 E.A.D. at 510 (EAB 2006)) 45 Fed. Reg. 33,290, 33,412 (1980); *see Envtl. Disposal Sys.*, 12 E.A.D. at 263-64; *Puna Geothermal Venture*, 9 E.A.D. at 246; *see also Presidium Energy*, UIC Appeal No. 09-01 at 2 n.4.

In support of this argument, Petitioner cites an email that he claims to have received from an article writer but did not provide. Petitioner also cites an article, Suthersan, *Hydraulic and Pneumatic Fracturing* (Chapter 9) in *Remediation Engineering: Design Concepts*, Suthersan, S. ed, (CRC Press, 1999).<sup>14</sup> This article discusses using intentional rock fracturing as a method of environmental remediation. This article neither calls into question Region 5's decision nor appears to support Petitioner's argument that the confining zone will swell and fracture upon converting to gypsum and create conduits through the confining zone. In rock fracturing such as

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<sup>14</sup> This article does not appear in the administrative record. Petitioner did not cite this article during public comment.

the article discusses, a party injects material into a geologic formation under pressure intended to be high enough to produce fracturing. Under the instant permit, no injections will occur into the Salina A-2 Evaporite and the intent of the maximum injection pressure limitation in the permit is to avoid fracturing, in any formation. As Region 5 stated during public comment, Region 5 has limited injection pressure to a pressure that will not produce fracturing in the injection zone, let alone the confining zone. Att. B-7, responses 2 and 39. In setting the injection limit, Region 5 set a conservative limit that provides an additional buffer of protection. Att. B-7, responses 2 and 39. Petitioner did not address Region 5's responses 2 and 39 in making Petitioner's argument 3, as the Board would have required had Petitioner raised his argument 3 during public comment. *City of Palmdale*, slip op. at 10.

Petitioner appears to have constructed his argument 3 by drawing a false analogy between fracturing and UIC injection. Therefore Petitioner has not met his burden of establishing either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

4. **Petitioner's argument 4, that the injectate will contaminate a USDW because the injectate will migrate upward through "pre-existing fractures" in the rock strata, fails on its merits and therefore even were the Board to evaluate this argument, the Board should dismiss the Petition as regards this argument**

At p. 6 of his Petition, Petitioner argues that the injectate will migrate upward to contaminate a USDW, because the injectate will migrate upward through "pre-existing fractures" in the rock strata. This argument fails to establish either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. §

124.19(a). Therefore, even were the Board to evaluate this argument not raised during public comment, the Board should dismiss the Petition as regards this argument.

Region 5 is severely handicapped in discussing Petitioner's argument 4, because Petitioner did not raise this argument during public comment and Region 5 accordingly had no chance to develop the administrative record to address it. But based on its existing review of public comments, Region 5 can point out error in Petitioner's argument.

Regarding argument 4, that the injectate will migrate upward through "pre-existing fractures" in the rock strata, Region 5 did not receive any analogous comment. But in multiple responses to comments, Region 5 stated that it engaged in expert technical review of the geologic siting for this well and concluded that this siting combined with the injection restrictions in the permit are sufficient to prevent the injectate from reaching a USDW. Att. B-7, responses 1, 6, 7, 31, 34, 51. Region 5 also addressed comments regarding other types of upward conduits, concluding that there were no mechanisms allowing the injectate to reach USDWs. Att. B-7, responses 5, 51. Region 5 also pointed out that Michigan geology is well-known and the site geology will prevent contamination of USDWs. Att. B-7, response 31. Region 5 also stated the following:

The UIC regulations mandate that the permit applicant must conduct a search for any other potential hydraulic conduits located within the area of review . . . [t]he submitted information allows the EPA to make an informed decision about the adequacy of the siting, construction and operation of the injection well. In this case, the applicant satisfied all requirements that ensure that no significant environmental impact will result from the proposed operation of this well. [Att. B-7, response 12]

In support of his argument 4, that the injectate will migrate upward through "pre-existing fractures" in the rock strata, Petitioner cites two articles not cited during public comment. These

articles neither call into question Region 5's decision nor appear to support Petitioner's argument 4. The first article, Weaver, Frappe, Cherry, *Recent Cross-Formational Fluid Flow and Mixing in the Shallow Michigan Basin*, Geol. Soc. Am. Bull. 107 (1995), discusses possible evidence that water has migrated along fractures between geologic strata less than 1,600 feet deep during or following the retreat of glaciers, about 10,000 years ago. This article addressed geologic strata in Canada on the northern edge of the Michigan basin, an area with well-documented fracture systems. Region 5's responses to public comment cited in the preceding paragraph indicate that no such fracture systems are known to exist in the well area.

Wilson, Long, Takacs, Rezabek, 1988, *Stable Isotope Geochemistry of Saline Near Surface Groundwater: East-Central Michigan Basin*, Geol. Soc. Am. Bull. 100, reaches the opposite conclusion from Petitioner's argument.<sup>15</sup> This article examines salinity in two aquifers up to 300 feet deep in Michigan and concludes that 1) this salinity arises from a mix of modern-day and past recharge from rain, snow melt and other atmospheric sources slowly flushing saline compounds out of the aquifer; and 2) one cannot confirm that this salinity arises from upward migration of more saline groundwater.

Petitioner appears to have constructed his argument 4 by misrepresenting a pair of geology articles. Therefore Petitioner has not met his burden of establishing either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

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<sup>15</sup> This article does not appear in the administrative record. Petitioner did not cite this article during public comment.

**5. Petitioner's argument 5, that the injectate will contaminate a USDW because Michigan groundwater naturally migrates upward and so the injectate will migrate upward, fails on its merits and therefore even were the Board to evaluate this argument, the Board should dismiss the Petition as regards this argument**

At p. 6 of his Petition, Petitioner argues that the injectate will migrate upward to contaminate a USDW, because Michigan groundwater migrates upward. This argument fails to establish either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a). Therefore even were the Board to evaluate this argument not raised during public comment, the Board should dismiss the Petition as regards this argument.

Region 5 is severely handicapped in discussing Petitioner's argument 5, because Petitioner did not raise this argument during public comment and Region 5 accordingly had no chance to develop the administrative record to address it. But based on its existing review of public comments, Region 5 can point out error in Petitioner's argument.

Regarding argument 5, that the injectate will migrate upward because Michigan groundwater migrates upward, Region 5 did not receive any analogous comment. But in multiple responses to comments, Region 5 stated that it engaged in expert technical review of the geologic siting for this well and concluded that this siting combined with the injection restrictions in the permit are sufficient to prevent the injectate from reaching a USDW. Att. B-7, responses 1, 6, 7, 31, 34, 51. Region 5 also pointed out that Michigan geology is well-known and the site geology will prevent contamination of USDWs. Att. B-7, response 31.

Petitioner cited no articles or facts in support of his argument 5. Petitioner's argument 5



is in fact merely a conclusory statement, without support even in the Petition. Therefore Petitioner has not met his burden of establishing either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

**6. Petitioner's argument 6, that the injectate will contaminate a USDW because it is being injected under pressure and that pressure will push the injectate upward, fails on its merits and therefore even were the Board to evaluate this argument, the Board should dismiss the Petition as regards this argument**

At pp. 5-6 of his Petition, Petitioner argues that the injectate will migrate upward to contaminate a USDW, because the pressure of its injection will push it upward. This argument fails to establish either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a). Therefore even were the Board to evaluate this argument not raised during public comment, the Board should dismiss the Petition as regards this argument.

Region 5 is severely handicapped in discussing Petitioner's argument 6, because Petitioner did not raise this argument during public comment and Region 5 accordingly had no chance to develop the administrative record to address it. But based on its existing review of public comments, Region 5 can point out error in Petitioner's argument.

Regarding argument 6, that the injectate will contaminate a USDW because the pressure of its injection will push it upward, Region 5 did not receive any analogous comment. But in multiple responses to comments, Region 5 stated that it engaged in expert technical review of the operating conditions for this well and concluded that the injection restrictions in the permit

combined with its geologic siting are sufficient to prevent the injectate from reaching a USDW. Att. B-7, responses 1, 6, 7, 43, 51. And in response to a public comment that the injection zone might fill up at some point and be unable to accept further injectate, Region 5 responded as follows:

EPA believes that the proposed injection zone, the Niagara Dolomite, is capable of receiving large volumes of produced brine. Michigan geology is consistent over a large area, meaning the injection zone is vast. [Att. B-7, response 35]

This response indicates that Region 5 concluded that given known conditions including the permeability of the injection zone and the impermeability of the confining zone, the injectate will migrate horizontally, not upward. Region 5 responded that the injection zone should not fill up, because of its vast horizontal extent. This conclusion assumes horizontal and not vertical migration. Region 5's response does not discuss the possibility of vertical migration, as the response should also have discussed had Region 5 concluded that vertical migration would occur.

Region 5 also responded to a separate comment regarding the injectate's spreading through the injection zone. Region 5 responded that if the well were operated continuously for 20 years, then the injectate would spread horizontally through the injection zone to a radius of 68-835 feet from the well. Att. B-7, response 42. Again, Region 5 concluded that under known conditions including the permeability of the injection zone and the impermeability of the confining zone, injectate will migrate horizontally, not vertically.

Petitioner cited no articles in support of his argument 6 and provides no context for his factual argument. Petitioner's argument 6 indicates at best a misunderstanding of how injection pressures play out at a depth of over 2,600 feet. Therefore Petitioner has not met his burden of

establishing either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

**7. Petitioner's argument 7, that the injectate will contaminate a USDW because none of the strata overlying the injection zone are impermeable, fails on its merits and therefore even were the Board to evaluate this argument, the Board should dismiss the Petition as regards this argument**

At p. 6 of his Petition, Petitioner argues that the injectate will migrate upward to contaminate a USDW, because none of the strata overlying the injection zone are impermeable. This argument fails to establish either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2) involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a). Therefore even were the Board to evaluate this argument not raised during public comment, the Board should dismiss the Petition as regards this argument.

Region 5 is severely handicapped in discussing Petitioner's argument 7, because Petitioner did not raise this argument during public comment and Region 5 accordingly had no chance to develop the administrative record to address it. But based on its existing review of public comments, Region 5 can point out error in Petitioner's argument.

Regarding argument 7, that the injectate will contaminate a USDW because none of the strata overlying the injection zone are impermeable, Region 5 did not receive any analogous comment. But in multiple responses to comments, Region 5 stated that it engaged in expert technical review of the geologic siting for this well and concluded that this siting combined with the injection restrictions in the permit are sufficient to prevent the injectate from reaching a USDW. Att. B-7, responses 1, 6, 7, 31, 34, 51. Region 5 also pointed out that Michigan geology

is well-known and the site geology will prevent contamination of USDWs. Att. B-7, response 31. And in multiple comments, Region 5 cited the impermeability of the rock strata overlying the injection zone. Att. B-7, responses 1, 2, 4, 34. Region 5 concluded that some of the overlying strata are impermeable, based on Region 5's technical expertise and longstanding familiarity with Michigan geology.

Petitioner cited no facts in support of his argument 7. Petitioner did cite two articles not cited during public comment. These articles neither call into question Region 5's decision nor appear to support Petitioner's argument 7. The first article, Briggs, 1958 *Evaporite Facies*, Journal of Sedimentary Petrology, Vol. 28 No.1, is simply irrelevant.<sup>16</sup> This article investigates the physical features of evaporite formations across several states to reconstruct the paleogeography of the Silurian Era and the mode of deposition of evaporite rocks. This article does not address the impermeability of rock strata in the well area.

The second article, Landes, 1951, *Detroit River Group*, Geological Survey Circular 133, is also irrelevant.<sup>17</sup> It correlates surface rock types and subsurface rock types to describe large-scale geologic structures across the State of Michigan. This article does not discuss impermeability, or any other hydrogeologic property of rock formations.

Petitioner appears to have constructed his argument 7 by misrepresenting a pair of unrelated geology articles. Therefore Petitioner has not met his burden of establishing either that the permit: 1) is based upon a clearly erroneous finding of fact or conclusion of law; or 2)

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<sup>16</sup> This article does not appear in the administrative record. Petitioner did not cite this article during public comment.

<sup>17</sup> This article does not appear in the administrative record. Petitioner did not cite this article during public comment.

involves an exercise of discretion or an important policy consideration which the Board should, in its discretion, review. 40 C.F.R. § 124.19(a).

**8. Petitioner's argument 8, that Region 5 should model how the injectate will behave upon injection, fails on its merits because Petitioner asks for relief outside the scope of the UIC program and so the Board should dismiss the Petition as regards this argument**

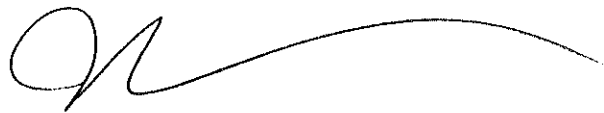
At Section IV.C.2 of this brief, above, Region 5 explained how alongside multiple other grounds the Board should dismiss the Petition as regards Petitioner's argument 8 because Petitioner seeks review of issues outside the boundaries of the UIC permitting program. These are the ultimate merits of Petitioner's argument 8 and Region 5 has nothing further to add to its discussion here.

## V. CONCLUSION

The Petition makes multiple arguments, all of which fail to meet threshold standards in that they variously: 1) fail to identify a specific permit condition for review; 2) fail to indicate Petitioner's participation in public comment and demonstrate that the conditions for review raised in the Petition were raised during the public comment period; 3) raise a novel argument on appeal; 4) fail to address Region 5's responses to Petitioner's specific comments and explain why those comments are inadequate; and 5) seek review of issues outside the boundaries of the UIC permitting program. Further, should the Board evaluate any of Petitioner's arguments regardless of the above deficiencies, enough information exists on the existing administrative record to conclude that each of these arguments is without merit. Petitioner thereby fails to meet the threshold procedural burden or his burden on merit of demonstrating that EPA's decision was based on a clearly erroneous finding of fact or conclusion of law, or included an exercise of

discretion or an important policy consideration which the Board should, in its discretion, review, as required by 40 C.F.R. 124.19(a). Region 5 therefore respectfully requests that the Board deny the Petition for Review.

Respectfully submitted,



Dated: February 25, 2012

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**CERTIFICATE OF SERVICE**

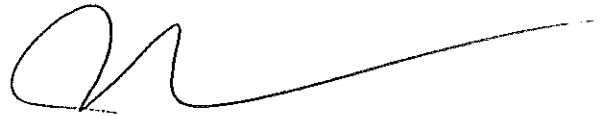
**Appeal No. UIC 13-01**

**West Bay Exploration Company  
West Bay 22 SWD  
UIC Permit MI-075-2D-0009**

I hereby certify that on this 25th day of February, 2013, I: 1) electronically filed the foregoing Response to Petition For Review with the Environmental Appeals Board, via Central Data Exchange; and 2) caused to be mailed a true and correct copy to the Petitioner by certified mail, return receipt requested, addressed as follows:

Peter Bormuth  
142 W. Pearl St.  
Jackson MI 49201

**Certified Mail No. 7001 0320 0005 8911 0632**



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