APPENDIX A: CERTIFIED INDEX OF ADMINISTRATIVE RECORD

Permit Writer's Administrative Record Certified Statement
Chevron Michigan, LLC, Stratton #16-4
UIC Permit MI-009-2D-0217

I, Allan Batka, an Environmental Engineer and permit writer in the Underground Injection Control Branch of the Water Division, Region 5 of the U.S. Environmental Protection Agency, certify that the administrative record for the final permit decision for the permit identified above was complete on July 25, 2013. The administrative record includes, to the best of my knowledge, all documents required by 40 C.F.R. §124.18.

The attached Administrative Record Index references all of the documents in the administrative record for this final permit decision.

Allan Batka, Permit Writer
Underground Injection Control Branch,
U.S. EPA, Region 5

9/12/13
Date

Index to the Administrative Record

Chevron Michigan, LLC, Stratton #16-4 , MI-009-2D-0217

Doc	Date of doc	Date received	Time	Title/Description/Subject	Author/sender	Addressee
				I. Permit Application (40 C.F.R. § 124.9(b)(1))		
1	1/10/12	01/18/2012		Chevron Michigan, LLC, Stratton #16-4 , MI-009-2D-0217 permit application	Chevron Michigan, LLC	
				II. Supporting Documentation Supplied by Permit Applicant (40 C.F.R. § 124.9(b)(1))		
2	1/10/12	01/18/2012		Permit Application Form	Chevron Michigan, LLC	
3	1/10/12	01/18/2012		Area of Review Methods	Chevron Michigan, LLC	
4	1/10/12	01/18/2012		Area of Review Maps	Chevron Michigan, LLC	
5	1/10/12	01/18/2012		Corrective Action	Chevron Michigan, LLC	
6	1/10/12	01/18/2012		Name and Depth of USDW	Chevron Michigan, LLC	
7	1/10/12	01/18/2012		Geology of Injection and Confining Zone	Chevron Michigan, LLC	
8	1/10/12	01/18/2012		Operating Data	Chevron Michigan, LLC	
9	1/10/12	01/18/2012		Formation Testing Program	Chevron Michigan, LLC	
10	1/10/12	01/18/2012		Stimulation Program	Chevron Michigan, LLC	
11	1/10/12	01/18/2012		Injection Procedure	Chevron Michigan, LLC	
12	1/10/2012	01/18/2012		Well Construction	Chevron Michigan, LLC	
13	1/10/12	01/18/2012		Well Schematic	Chevron Michigan, LLC	
14	1/10/12	01/18/2012		Contingency Plan	Chevron Michigan, LLC	
15	1/10/12	01/18/2012		Monitoring Program	Chevron Michigan, LLC	
16	1/10/12, 4/6/12	01/18/2012		Plugging and Abandonment Plan	Chevron Michigan, LLC	
17	11/22/1995	01/18/2012		Record of Well Drilling or Deepening # 48814	Chevron Michigan, LLC	
18	1/10/2012	01/18/2012		MDNR Permit Application to Drill #	Chevron Michigan, LLC	
19	1/10/2012	01/18/2012		State Historic Preservation Section 106 Review	Chevron Michigan, LLC	
20	1/10/2012	01/18/2012		Endangered Species Act Assessment Report	Chevron Michigan, LLC	
21	11/3/2011	01/18/2012		General Water Analysis	Chevron Michigan, LLC	
22	1/10/12	01/18/2012		Fracture Gradient Data	Chevron Michigan, LLC	
23	1/10/12	01/18/2012		List of property owners	Chevron Michigan, LLC	
24	3/7/2012	04/06/2012		Financial Assurance Documentation	Chevron Michigan, LLC	
25	1/10/2012	01/18/2012		Description of Buisness	Chevron Michigan, LLC	
26	3/20/2012	03/20/2012		USDW information from applicant	Chevron Michigan, LLC	
27	4/6/2012	04/06/2012		Revised permit application	Chevron Michigan, LLC	
				III. Draft Permit or Notice of Intent to Deny the Application or Terminate the Permit (40 C.F.R. § 124.9(b)(2))		
28				Chevron Michigan, LLC, Stratton #16-4 , MI-009-2D-0217	Allan Batka	
				IV. Statement of Basis or Fact Sheet (40 C.F.R. § 124.9(b)(3))		
29				Statement of Basis for draft permit # MI-009-2D-0217	Allan Batka	
				V. All Documents Cited in the Statement of Basis or Fact Sheet (40 C.F.R. § 124.9(b)(4))		
30				40 CFR Parts 124, 144, 146, and 147		

Doc	Date of doc	Date received	Time	Title/Description/Subject	Author/sender	Addressee
VI. Other Documents Contained in the Supporting File for the Draft Permit (40 C.F.R. § 124.9(b)(5))						
31	1/31/2012			UIC Area of Review Investigation	Steve Roy	
32	2/15/2012	02/24/2012		Historic Preservation Act Determination	State of Michigan	
33	5/29/2012			Public notice announcement for draft permit # MI-009-2D-0217	Allan Batka	
34	2/22/2012			Information Request	Allan Batka	Chevron
35				Class 2 Technical Review Sheet	Allan Batka	
VII. Documents Contained in the Supporting File for the Final Permit (40 C.F.R. § 124.18(b))						
36	5/24/2012			EPA letter to Chevron re: draft permit	Lisa Perenchio	Chevron
37		05/29/2012		certified mail receipt #70091680000076442473	EPA	Chevron
38	6/4/2012	06/07/2012		comments from Norma Petrie	Norma Petrie	EPA
39	6/22/2012	06/25/2012		comments from Lawrence and Sandra Nemecek	Lawrence and Sandra Nemecek	EPA
40	6/19/2012	06/25/2012		comments from Monica Nemecek	Monica Nemecek	EPA
41	5/29/2012	05/29/2012		comments from Peter Bormuth	Peter Bormuth	EPA
42	6/26/2012	06/29/2012		comments from Lucille Lercel	Lucille Lercel	EPA
43	8/21/2012	08/29/2012		EPA response to comments from Norma Petrie	EPA	Norma Petrie
44	8/21/2012	08/24/2012		EPA response to comments from Lawrence and Sandra Nemecek	EPA	Lawrence and Sandra Nemecek
45	8/15/2012	08/25/2012		EPA response to comments from Monica Nemecek	EPA	Monica Nemecek
46	8/15/2012	08/18/2012		EPA response to comments from Peter Bormuth	EPA	Peter Bormuth
47	8/15/2012	08/17/2012		EPA response to comments Lucille Lercel	EPA	Lucille Lercel
48	8/22/2012			EPA letter to Chevron re: final permit	Rebecca Harvey	Chevron
49		08/27/2012		certified mail receipt #70091680000076622004	EPA	Chevron
50				map of Charlevoix and Antrim Counties	Allan Batka	
51	6/29/2012			Michigan list of wild and scenic rivers	Michigan	
52	10/1/1972			Jordan River Natural River Plan	MDNR	
53	8/20/2012			Final Permit	EPA	
54	10/11/2012			Letter from Environmental Appeals Board	Environmental Appeals Board	Robert Kaplan, Regional Counsel
55	11/21/2012			Response to Petition for Review	Robert Smith, EPA	Environmental Appeals Board
56	3/5/2013			Remand Order	Environmental Appeals Board	
57		4/11/2013, 4/12/13, 4/24/13		Letter from Norma Petrie to Environmental Appeals Board	Norma Petrie	Environmental Appeals Board
58	5/2/2013			Letter from Environmental Appeals Board to Norma Petrie	Environmental Appeals Board	Norma Petrie

Doc	Date of doc	Date received	Time	Title/Description/Subject	Author/sender	Addressee
59	5/13/2013	05/15/2013		Letter from Norma Petrie	Norma Petrie	Tinka Hyde, EPA
60	6/10/2013			Letter from Allan Batka, EPA to Norma Petrie	Allan Batka, EPA	Norma Petrie
61	7/25/2013			EPA's Response to Comments	Allan Batka, EPA	
62	7/25/2013			Final Permit	EPA	
63	7/25/2013			Letter from Tinka Hyde, EPA to Chevron re: final permit	EPA	Chevron
64		07/30/2013		Certified mail #70091680000076640428 receipt	EPA	Lucille Lercel
65		07/31/2031		Certified mail #70091680000076640442 receipt	EPA	Norma Petrie
66		07/27/2013		Certified mail #70091680000076640411 receipt	EPA	Peter Bormuth
67		07/27/2013		Certified mail #70091680000076640404 receipt	EPA	Lawrence and Sandra Nemecek
68		07/29/2013		Certified mail #70010320000589236455 receipt	EPA	Chevron
69	8/13/2013	08/19/2031		Petition Seeking Board Review of UIC Permit MI-009-2D-0217	Norma Petrie	EAB
70	9/5/2031			Letter from Allan Batka (EPA) to Chevron re: permit appeal	EPA	Chevron

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

B-1 Class II UIC Permit for Chevron Michigan, LLC, Stratton #16-4, Antrim County, Michigan, dated July 25, 2013

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) UNDERGROUND INJECTION CONTROL PERMIT: CLASS II

Permit Number: MI-009-2D-0217

Facility Name: Stratton #16-4

Pursuant to the provisions of the Safe Drinking Water Act, as amended (42 U.S.C. 300f et seq., commonly known as the SDWA) and implementing regulations promulgated by the United States Environmental Protection Agency (USEPA) at Parts 124, 144, 146 and 147 of Title 40 of the Code of Federal Regulations (40 CFR),

Chevron Michigan, LLC of Traverse City, Michigan

is hereby authorized to drill and operate an injection well located in Michigan, Antrim County, T31N, R6W, Section 4, 1/4 Section SE, for injection into the Dundee Limestone at depths between 1343 and 1535 feet, upon the express condition that the permittee meet the restrictions set forth herein. Injection shall not commence until the operator has received authorization in accordance with Part I(E)(10) of this permit.

The purpose of the injection is limited to noncommercial brine disposal from production wells owned or operated by Chevron Michigan, LLC.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit is effective.

This permit shall become effective on AUG 2 7 2013 and shall remain in full force and effect during the operating life of the well, unless this permit is otherwise revoked, terminated, modified or reissued pursuant to 40 CFR §§ 144.39, 144.40 and 144.41. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Michigan, unless that State chooses to adopt this permit as a State permit. The permit will expire in one (1) year if the permittee fails to commence construction, unless a written request for an extension of this one (1) year period has been approved by the Director. The permittee may request an expiration date sooner than the one (1) year period, provided no construction on the well has commenced. This permit will be reviewed at least every five (5) years from the effective date specified above.

Signed and dated: July 25, 2013

Tinka G. Hyde
Director, Water Division

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PART I

GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, otherwise authorized by this permit or rule, shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any Primary Drinking Water Regulation pursuant to 40 CFR Part 142 or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit or otherwise authorized by permit or rule is prohibited. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA), or any other law governing protection of public health or the environment.

B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR §§ 144.39, 144.40, and 144.41. The filing of a request for a permit modification, revocation and reissuance, termination, or the notification of planned changes or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 CFR Part 2 and § 144.5, any information submitted to the USEPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, USEPA may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures in 40 CFR Part 2 (Public Information). Claims of confidentiality for the

following information will be denied:

(1) The name and address of the permittee; and,

(2) Information which deals with the existence, absence or level of contaminants in drinking water.

E. DUTIES AND REQUIREMENTS

1. Duty to Comply

The permittee shall comply with all conditions of this permit, except to the extent and for the duration such non-compliance is authorized by an emergency permit pursuant to 40 CFR § 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance or modification.

2. Penalties for Violations of Permit Conditions

Any person who operates this well in violation of permit conditions is subject to civil penalties, fines, and other enforcement action under the SDWA and may be subject to such actions under the Resource Conservation and Recovery Act. Any person who willfully violates a permit condition is subject to criminal prosecution.

3. Need to Halt or Reduce Activity not a Defense

It shall not be a defense for a permittee in an enforcement action to state that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

5. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar

systems only when necessary to achieve compliance with the conditions of the permit.

6. **Duty to Provide Information**

The permittee shall furnish to the Director, within thirty (30) days, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required by this permit to be retained.

7. **Inspection and Entry**

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be retained under the conditions of this permit;

c. Inspect, at reasonable times, any facilities, equipment (including monitoring equipment), practices, or operations, regulated or required under this permit; and

d. Sample or monitor the injected fluids, at reasonable times, for the purposes of assuring permit compliance, or as otherwise authorized by the SDWA, at any location.

8. **Records**

a. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all records required by this permit, for a period of at least three (3) years from the date of the sample, measurement or report. The permittee shall also maintain records of all data required to complete this permit application and any supplemental information submitted under 40 CFR §§ 144.31 and 144.51. These periods may be extended by request of the Director at any time by written notice to the permittee.

b. The permittee shall retain records concerning the nature and composition of all injected fluids until three (3) years after the completion of plugging and abandonment in accordance with the plugging and abandonment plan,

contained in Part III(B) of this permit. The owner or operator shall continue to retain the records after the three (3) year retention period unless he delivers the records to the Regional Administrator or obtains written approval from the Regional Administrator to discard the records.

c. Records of monitoring information shall include:

(i) The date, exact place, and the time of sampling or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) A precise description of both sampling methodology and the handling of samples;

(iv) The date(s) analyses were performed;

(v) The individual(s) who performed the analyses;

(vi) The analytical techniques or methods used; and,

(vii) The results of such analyses.

9. **Notification Requirements**

a. **Planned Changes** - The permittee shall notify and obtain the Director's approval at least thirty (30) days prior to any planned physical alterations or additions to the permitted facility, or changes in the injection fluids. Within ten (10) days prior to injection, an analysis of new injection fluids shall be submitted to the Director for approval in accordance with Parts II(B)(2) and II(B)(3) of this permit.

b. **Anticipated Noncompliance** - The permittee shall give at least thirty (30) days advance notice to the Director for his/her approval of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

c. **Transfer of Permits** - This permit is not transferable to any person except after notice is sent to the Director at least thirty (30) days prior to transfer and the requirements of 40 CFR § 144.38 have been met. The Director may require modification or revocation of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA.

d. **Compliance Schedules** - Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any

compliance schedule of this permit shall be submitted to the Director no later than thirty (30) days following each schedule date.

e. **Twenty-Four Hour Reporting**

(i) The permittee shall report to the Director any noncompliance which may endanger health or the environment. This information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall include the following information:

(a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or,

(b) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

(ii) A written submission shall also be provided as soon as possible but no later than five (5) days from the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

f. **Other Noncompliance** - All other instances of noncompliance shall also be reported by the permittee in accordance with Part I(E)(9)(e)(i) and (ii) of this permit.

g. **Other Information** - If or when the permittee becomes aware that the permittee failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit such facts or corrected information in accordance with 40 CFR § 144.51(l)(8).

h. **Report on Permit Review** - Within thirty (30) days of receipt of the final issued permit, the permittee shall report to the Director that the permittee has read and is personally familiar with all terms and conditions of this permit.

10. **Commencing Injection**

The permittee shall not commence injection into any newly drilled or converted well until:

a. Formation data and injection fluid analysis have been submitted in accordance with Parts II(A)(6) and II(B)(2), respectively;

b. A report on any logs and tests required under Parts II(A)(5) and III(D) of this permit has been submitted.

c. Mechanical integrity of the well has been demonstrated in accordance with Part I(E)(17);

d. Any required corrective action has been performed in accordance with Parts I(E)(16) and III(C); and,

e. Construction is complete and the permittee has submitted to the Permit Writer, by certified mail with return receipt requested, a notice of completion of construction using EPA Form 7520-10 and either:

(i) The Director has inspected or otherwise reviewed the new injection well and finds it is in compliance with the conditions of the permit; or,

(ii) The permittee has not received, within thirteen (13) days of the date of the Director's receipt of the report required above, notice from the Director of his or her intent to inspect or otherwise review the new injection well, in which case prior inspection or review is waived and the permittee may commence injection.

11. **Signatory Requirements**

All reports or other information requested by the Director shall be signed and certified according to 40 CFR § 144.32.

12. **Notice of Plugging and Abandonment**

The permittee shall notify the Director at least forty-five (45) days before conversion or abandonment of the well.

13. **Plugging and Abandonment**

The permittee shall plug and abandon the well as provided in the plugging and abandonment plan contained in Part III(B) of this permit. Plugging shall occur as soon as practicable after operation ceases but not later than two (2) years thereafter. During the period of non-operation, the well must be tested to ensure

that it maintains mechanical integrity, unless the permittee fulfills the other requirements under 40 CFR § 144.52(a)(6), prior to expiration of the two (2) year period. The permittee shall notify the Director of plugging and abandonment in accordance with the reporting procedures in Part I(E)(12) of this permit.

14. **Financial Responsibility**

The permittee shall maintain financial responsibility and resources to plug and abandon the underground injection well in accordance with 40 CFR § 144.52(a)(7) as provided in Attachment R of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The permittee shall not substitute an alternative demonstration of financial responsibility from that which the Director has approved, unless the permittee has previously submitted evidence of that alternative demonstration to the Director and the Director has notified the permittee in writing that the alternative demonstration of financial responsibility is acceptable. The financial responsibility mechanism shall be updated periodically, upon request of the Director, except when Financial Statement Coverage is used as the financial mechanism, this coverage must be updated on an annual basis.

15. **Insolvency**

a. In the event of the bankruptcy of the trustee or issuing institution of the financial mechanism, or a suspension or revocation of the authority of the trustee institution to act as trustee or the institution issuing the financial mechanism to issue such an instrument, the permittee must submit an alternative demonstration of financial responsibility acceptable to the Director within sixty (60) days after such event. Failure to do so will result in the termination of this permit pursuant to 40 CFR § 144.40(a)(1).

b. An owner or operator must also notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within ten (10) business days after the commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if he/she is named as debtor, as required under the terms of the guarantee.

16. **Corrective Action**

The permittee shall shut in the injection well whenever he/she or the USEPA determines that operation thereof may be causing upward fluid migration through the well bore of any improperly plugged or unplugged well in the area of review and shall take such steps as he/she can to properly plug the offending well(s). Any operation of the well which may cause upward fluid migration from an improperly plugged or unplugged well will be considered a violation of this

permit. If the permittee or the USEPA determines that the permitted well is not in compliance with 40 CFR § 146.8, the permittee will immediately shut in the well until such time as appropriate repairs can be effected and written approval to resume injection is given by the Director. In addition, the permittee shall not commence injection until any and all corrective action has been taken in accordance with any plan contained in Part III(C) of this permit and the requirements in Part I(E)(10) of this permit have been met.

17. **Mechanical Integrity**

a. The permittee must establish (prior to receiving authorization to inject), and shall maintain mechanical integrity of this well, in accordance with 40 CFR § 146.8.

b. A demonstration of mechanical integrity, in accordance with 40 CFR § 146.8, shall be performed at least every five (5) years from the date of the last approved demonstration. The permittee shall notify the Director of his/her intent to demonstrate mechanical integrity at least thirty (30) days prior to such demonstration.

c. The permittee shall demonstrate the mechanical integrity of the well by pressure testing whenever:

(i) the tubing is removed from the well or replaced;

(ii) the packer is reset; or,

(iii) a loss of mechanical integrity occurs. Operation shall cease whenever one of the aforementioned conditions occurs and not resume until the Director gives approval to recommence injection.

d. The Director may, by written notice, require the permittee to demonstrate mechanical integrity at any time.

e. The permittee shall cause all gauges used in mechanical integrity demonstrations to be calibrated prior to the demonstration.

f. The permittee shall cease injection if a loss of mechanical integrity occurs or is discovered during a test, or a loss of mechanical integrity as defined by 40 CFR § 146.8 becomes evident during operation. Operations shall not be resumed until the Director gives approval to recommence injection.

g. The permittee shall notify the Director of the loss of mechanical integrity, in accordance with the reporting procedures in Parts II(B)(3)(d) and I(E)(9)(e) of this permit.

h. The permittee shall report the result of a satisfactory mechanical integrity demonstration as provided in Part II(B)(3)(d) of this permit, except the first such result after Permit issuance, which shall be sent to the Permit Writer.

18. **Restriction on Injected Substances**

The permittee shall be restricted to the injection of fluids brought to the surface in connection with conventional oil or natural gas production or those fluids used in the enhancement of oil and gas production as specified in 40 CFR § 146.5(b). Further, no fluids other than those from sources noted in the administrative record for this permit and approved by the Director shall be injected.

PART II

WELL SPECIFIC CONDITIONS FOR UNDERGROUND INJECTION CONTROL PERMITS

A. CONSTRUCTION REQUIREMENTS

1. Siting

Notwithstanding any other provision of this permit, the injection well shall inject only into a formation which is separated from any USDW by a confining zone that is free of known open faults or fractures within the area of the review.

2. Casing and Cementing

Injection wells shall be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement to be used in the construction of the well shall be as contained in Attachments L and M of the administrative record corresponding to this permit action which is hereby incorporated by reference as if they appeared fully set forth herein.

3. Tubing and Packer Specifications

Injection shall only take place through tubing with a packer set in the long string casing within or below the nearest cemented and impermeable confining system immediately above the injection zone. Tubing and packer specifications shall be as represented in engineering drawings contained in Attachments L and M of the administrative record corresponding to this permit action which are hereby incorporated by reference as if they appeared fully set forth herein. Any proposed changes shall be submitted by the permittee in accordance with Part I(E)(9)(a) and (b) of this permit.

4. Wellhead Specifications

For every injection well, the operator shall provide a female fitting, with a cutoff valve, to the tubing at the wellhead, so that the amount of injection pressure being used may be measured by a representative of the USEPA by attaching a gauge having a male fitting.

5. Logs and Tests

Upon approval of the surface casing and cementation records by the Director, any logs and tests noted in Part III of this permit shall be performed, unless already provided. Prior to commencement of injection, the permittee shall submit a descriptive report prepared by a knowledgeable log analyst interpreting the results

of those logs and tests to the Director for approval along with the notice of completion required in Part I(E)(10) of this permit.

6. **Formation Data**

If not already provided, the permittee shall determine or calculate the following information concerning the injection formation and submit it to the Director for review and approval, prior to operation:

a. Formation fluid pressure;

b. Fracture pressure; and,

c. Physical and chemical characteristics of the formation.

7. **Prohibition of Unauthorized Injection**

Any underground injection, except as authorized by permit or rule issued under the UIC program, is prohibited. The construction, including drilling, of any well required to have a permit is prohibited until the permit has been issued.

B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

1. **Operating Requirements**

a. Beginning on the effective date of this permit, the permittee is authorized to operate the injection well, subject to the limitations and monitoring requirements set forth herein. The injection pressure and injected fluid shall be limited and monitored as specified in Parts I(E)(18) and III(A) of this permit.

b. Injection at a pressure which initiates fractures in the confining zone or causes the movement of injection or formation fluids into or between underground sources of drinking water is prohibited.

c. Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.

d. The annulus between the tubing and the long string casing shall be filled with a liquid designed to inhibit corrosion. The annulus liquid will be monitored in accordance with Parts II(B)(2)(d) and II(B)(3)(b) of this permit. Any specific annulus requirements are contained in Part III(A) of this permit.

2. **Monitoring Requirements**

a. Samples and measurements, taken for the purpose of monitoring as required in Part II(B)(3), shall be representative of the monitored activity. Grab samples shall be used to obtain a representative sample of the fluid to be analyzed. Part III(A) of this permit describes the sampling location and required parameters for injection fluid analysis. The permittee shall identify the types of tests and methods used to generate the monitoring data. The monitoring program shall conform to the one described in Part III(A) of this permit.

b. **Analytical Methods** - Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR § 136.3 or in Appendix III of 40 CFR Part 261 or by other methods that have been approved by the Director.

c. **Injection Fluid Analysis** - The nature of the injection fluids shall be monitored as specified in Part III(A) of this permit. An initial analysis of the injection fluid is contained in Attachment H of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The Director may, by written notice require the permittee to sample and analyze the injected fluid at any time.

d. **Injection Pressure, Annulus Pressure, Annulus Liquid Loss, Flow Rate and Cumulative Volume** - Injection pressure, annulus pressure, flow rate and cumulative volume shall be recorded at least weekly and shall be reported monthly as specified in Part III(A) of this permit. Annulus liquid loss shall be recorded at least quarterly and shall be reported in accordance with the provisions of Part II(B)(3)(b), as the volume of liquid added to the annulus to keep it filled in accordance with Part II(B)(1)(d). All gauges used in monitoring shall be calibrated in accordance with Part I(E)(17)(e) of this permit.

3. **Reporting Requirements**

Copies of the monitoring results and all other reports shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590
Attn: UIC Branch, Direct Implementation (WU-16J)

a. **Monthly Reports** - Monitoring results obtained during each week shall be recorded on a form which has been signed and certified according to 40 CFR § 144.32. The first report shall be postmarked no later than the 10th day of the month after authorization to inject has been granted. Thereafter, forms shall be submitted at the end of each month and shall be postmarked no later than the 10th day of the month following the reporting period. This report shall include the weekly measurements of injection pressure, annulus pressure, flow rate and cumulative volume as required in Parts II(B)(2)(d) and III(A) of this permit.

b. **Quarterly Reports** - Monitoring results obtained each quarter shall include the measurement of annulus liquid loss as required in Parts II(B)(2)(d) and III(A) of this permit. Reports shall be submitted at the end of each quarter and shall be postmarked no later than the 10th day of the first month of the following quarter.

c. **Annual Reports** - Monitoring results obtained each year shall include the measurements of injected fluid characteristics as required in Part III(A) of this permit. Reports shall be submitted at the end of each anniversary year and shall be postmarked no later than the 10th day of the first month of the following year.

d. **Reports on Well Tests, Workovers, and Plugging and Abandonment** - The applicant shall provide the Director with the following reports and test results within sixty (60) days of completion of the activity:

(i) Mechanical integrity tests, except tests which the well fails in which case twenty-four (24) hour reporting under Part I(9)(e) is applicable;

(ii) Logging or other test data;

(iii) Well workovers (using EPA Form 7520-12); and

(iv) Plugging and abandonment.

PART III

SPECIAL CONDITIONS

These special conditions include, but are not limited to plans for maintaining correct operating procedures, monitoring conditions and reporting, as required by 40 CFR Parts 144 and 146. These plans are described in detail in the permittee's application for a permit, and the permittee is required to adhere to these plans as approved by the Director, as follows:

A. OPERATING, MONITORING AND REPORTING REQUIREMENTS (ATTACHED)

B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)

C. CORRECTIVE ACTION PLAN (ATTACHED)

OPERATING, MONITORING AND REPORTING REQUIREMENTS

Characteristic	Limitation	Minimum Monitoring Requirements		Minimum Reporting Requirements
		Freq.	Type	Freq
*Injection Pressure	446 psig (maximum)	weekly		monthly
Annulus Pressure		weekly		monthly
Flow Rate		weekly		monthly
Cumulative Volume		weekly		monthly
Annulus Liquid Loss		quarterly		quarterly
**Chemical Composition of Injection Fluid		annually	grab	annually

SAMPLING LOCATION: The sample location is at the well head.

*The limitation on wellhead pressure serves to prevent confining-formation fracturing. This limitation was calculated using the following formula: [{0.8 *psi/ft* - (0.433 *psi/ft*)(specific gravity)} x depth] - 14.7 *psi*. The maximum injection pressure is dependent upon depth and specific gravity of the injected fluid. The Dundee Limestone at 1343 feet was used as the depth and a specific gravity of 1.055 was used for the injected fluid.

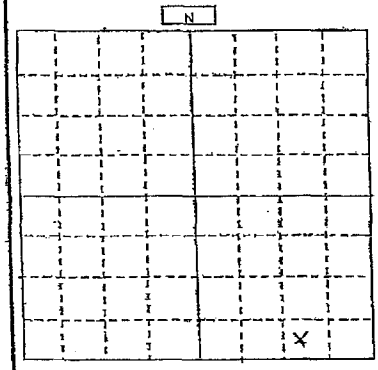
**Chemical composition analysis shall include, but not be limited to, the following: Sodium, Calcium, Magnesium, Barium, Total Iron, Chloride, Sulfate, Carbonate, Bicarbonate, Sulfide, Total Dissolved Solids, pH, Resistivity (ohm-meters @ 75°F), and Specific Gravity.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

PLUGGING AND ABANDONMENT PLAN

WELL NAME & NUMBER, FIELD NAME, LEASE NAME & NUMBER	NAME, ADDRESS, & PHONE NUMBER OF OWNER / OPERATOR
Stratton 16-4 SWD	Chevron Michigan, LLC 10691 E. Carter Rd. Suite 201 Traverse City, MI 49684 231-995-4000

Locate Well and Outline Unit on Section Plat - 640 Acres



STATE	COUNTY	STATE PERMIT NUMBER
MI	Antrim	60515

SURFACE LOCATION DESCRIPTION
SW/SE/SE, Sec. 4, T31N-R6W

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT
Surface Location 465 ft. From (N/S) SOUTH Line of Quarter Section
And 587 ft. From (E/W) EAST Line of Quarter Section

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Rule
- [ ] Area Permit

Number of Wells in Area Permit :

US EPA Permit Number : MI-009-2D-0217

WELL ACTIVITY
- [ ] Class I
  - [ ] Hazardous
  - [ ] Nonhazardous
- [x] Class II
  - [x] Brine Disposal
  - [ ] Hydrocarbon Storage
  - [ ] Enhanced Recovery
- [ ] Class III
- [ ] Class IV

CASING/TUBING/CEMENT RECORD AFTER PLUGGING AND ABANDONMENT

Size	Wt (lb/ft) TBG/CSG	Original Amount (CSG)	CSG to be Left in Well	Hole Size	Sacks Cement Used	Type
13-3/8"	Conductor	50	50	Driven	Driven	-
8-5/8"	20#	245	245	12-1/4"	150 sks	Class A
5-1/2"	13#	1535	1535	7-7/8"	280 sks	Class A

METHOD OF EMPLACEMENT OF CEMENT PLUGS.
- [x] Balance Method
- [ ] Dump Bailer Method
- [ ] Two Plug Method
- [ ] Other

CEMENT TO PLUG AND ABANDON DATA	Plug # 1	Plug # 2	Plug # 3	Plug # 4	Plug # 5	Plug #6	Plug #7
Size of Hole or Pipe in Which Plug Will Be Placed (inches)	5-1/2"	5-1/2"					
Calculated Top of Plug (ft.)	1300	Surface					
Measured Top of Plug (ft.)	n/a	n/a					
Depth to Bottom of Plug (ft.)	1350	1300					
Sacks of Cement to be Used	6	153					
Slurry Volume to be Used (cu. Ft.)	7	180					
Slurry Weight (lb./gal.)	15.6	15.6					
Type of Cement, Spacer or Other Material Used	Class A	Class A					
Type of Preflush Used	-	-					

DESCRIPTION OF PLUGGING PROCEDURE

MI Service Unit. TOH w/ packer & tubing. TIH w/ CIBP. Set CIBP at 1350'. TOH w/ tbg. Spot 6 sks cement on CIBP. Spot 153 sks of cement to surface. Cut csg 4' below ground level. Weld plate on sub. Restore location.

ESTIMATED COST OF PLUGGING AND ABANDONMENT

Cement	$5,000.00	Cast Iron Bridge Plug	$2,000
Logging	$0.00	Cement Retainer	$0
Rig or Pulling Unit	$5,000.00	Miscellaneous	$2,500
		Total	$14,500

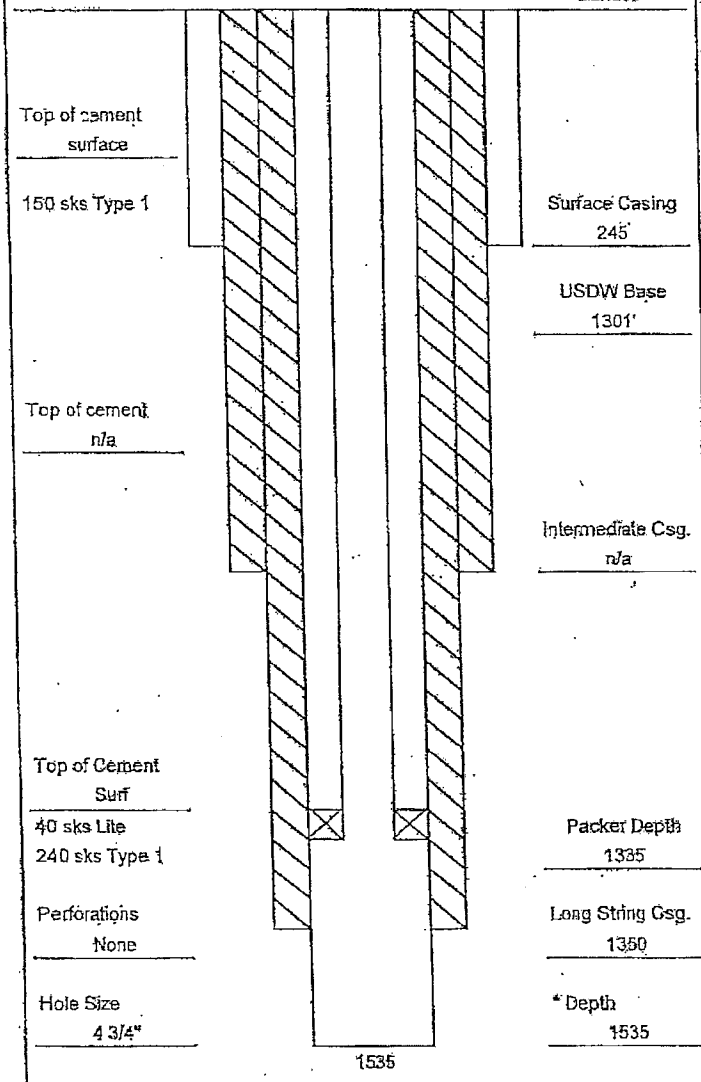
CERTIFICATION

I certify under the penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref 40 CFR 144.32)

NAME AND OFFICIAL TITLE	SIGNATURE	DATE SIGNED
Michael Link, Technical Team Lead, Engineering		04/06/12

ORIGINAL WELL CONSTRUCTION DURING OPERATION

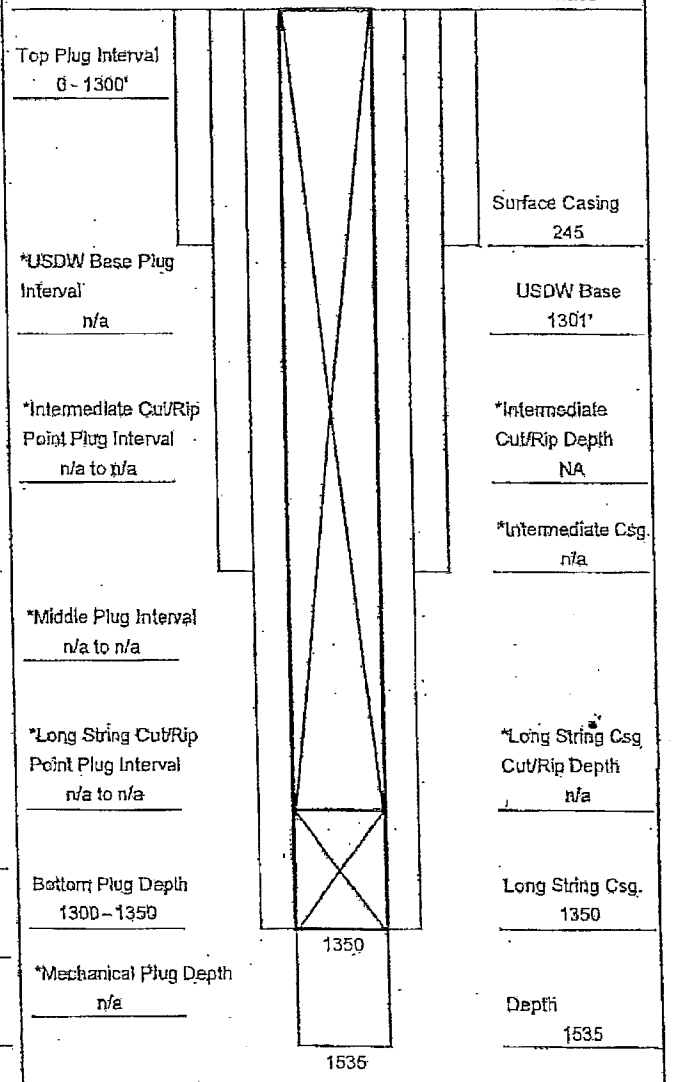
Stratton 16-4 SWD



** Add Any Additional Information
* May not Apply

PLUGGING AND ABANDONMENT CONSTRUCTION

Stratton 16-4 SWD



** Add Any Additional Information
* May not Apply

LIST OF ALL OPEN AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED

Specify Open Hole/ Perforations/ Varied Casing		From	To	Formation Name
4-3/4"	Open Hole	1350	1535	Dundee

CORRECTIVE ACTION PLAN

No corrective action is required at this time.

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

B-2 Appeal of U.S. EPA Final Decision Regarding Permit #MI-009-2D-0217, Chevron Michigan, LLC, Stratton #16-4, Class II Injection Well, T31N, R6W, Section 4, ¼ Section SE, Antrim County, Michigan, dated September 16, 2012, filed September 28, 2012 [hereinafter Petition #1]

Norma Petrie
5169 St. Johns Road
East Jordan, MI 49727

September 16, 2012

Environmental Protection Agency
Clerk of the Board
Environmental Appeals Board (MC 1103B)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460-0001

Clerk of the Board:

I am requesting an administrative review in accordance with 40 CFR Section 124.19, part (2) of the decision to allow Chevron to inject brine water in the vicinity of my property (Draft permit # MI-009-2D-0217).

I believe this decision is based on tenuous knowledge of the relationship between injection wells and underground drinking water and that the EPA has an imperative to protect and defend our water sources as a matter of policy and that an administrative review is in order to bring recent scientific evidence to the panel.

Sincerely,

Norma Petrie

Norma Petrie
231-350-1110 (cell)

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

B-3 U.S. EPA, Region 5, comprehensive Response to Comments dated July 25, 2013 [hereinafter Response to Comments #2]

RESPONSE TO COMMENTS

Date: JUL 2 5 2013

REGARDING UNDERGROUND INJECTION CONTROL (UIC) PERMIT #MI-009-2D-0217 ISSUED TO CHEVRON MICHIGAN, LLC., FOR THE STRATTON #16-4 INJECTION WELL IN ANTRIM COUNTY, MICHIGAN FOR THE PURPOSE OF NONCOMMERCIAL DISPOSAL OF OILFIELD BRINE FROM PRODUCTION WELLS OWNED OR OPERATED BY CHEVRON MICHIGAN, LLC.

Introduction

This response to comments document is a comprehensive response that responds to all comments received by United States Environmental Protection Agency (EPA), Region 5, for this permitting action. Region 5 previously issued a final permit decision on this matter on August 20, 2012, however, the Environmental Appeals Board (EAB) issued a remand relating to this permit in *In re Chevron Michigan,* LLC, UIC Appeal No. 12-01 (EAB 2013) on March 5, 2013. The EAB remand allowed Region 5 to reissue this final permit along with a comprehensive response to all comments. The EAB stated in its remand order on pages 17-18:

> This Remand Order does not reopen the public comment period. After the Region completes its action on remand, anyone dissatisfied with the Region's actions on remand must file a petition seeking Board review in order to exhaust administrative remedies pursuant to [40 C.F.R. § 124.19(*l*)(2)].[1] Any such petitions shall be limited to those issues addressed by the Region on remand or raised by or in connection with the remand procedures. No new issues may be raised that could have been raised, but were not raised, in the present appeal.

Region 5 is providing this response in accordance with Section 124.17 of Title 40 of the Code of Federal Regulations (40 C.F.R. § 124.17), which requires EPA to issue a response to comments at the time it issues a final permit decision. That response must: (1) briefly describe and respond to all significant comments raised during the public comment period; and (2) specify which provisions, if any, of the draft decision have been changed and the reasons for the change. In addition, EPA must include in the administrative record any documents cited in the response to comments, and make the response to comments available to the public.

[1] EPA recently issued a rule revising part 124.19, which became effective on March 26, 2013. Anyone filing a petition for review upon the Region's completion of actions on remand after March 26, 2013, should follow the latest version of § 124.19 in preparing a petition for review. *See* Revisions to Procedural Rules To Clarify Practices and Procedures Applicable in Permit Appeals Pending Before the Environmental Appeals Board, 78 Fed. Reg. 5281 (Jan. 25, 2013). Additional information on this change is available on the Board's website at: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/General+Information/Regulations+Governing+Appeals?OpenDocument

Background

The scope of the Federal Underground Injection Control (UIC) regulations is limited to the determination of the soundness of construction and operation of injection wells as they relate to the protection of all underground sources of drinking water (USDWs). A USDW is an aquifer or its portion which contains less than 10,000 mg/l of total dissolved solids.

In this case, the proposed well will be drilled to a depth of 1,535 feet below ground surface into the Dundee Limestone. The top of the injection zone is at 1,343 feet. The base of the lowermost USDW has been identified at a depth of 1,301 feet below ground surface and is separated from the top of the Dundee Limestone injection zone by approximately 42 feet of sedimentary rock strata. This rock strata consists of very low permeability rock and will prevent vertical migration of fluid. In addition, all well casing strings are adequately cemented to preclude the movement of fluids into and between USDWs due to injection operations.

As additional protection, injection will take place through tubing which is set within the steel casing. A packer will be set at the bottom of the tubing to seal off the space between the casing and tubing, which will be filled with a liquid mixture containing a corrosion inhibitor, and will allow the pressure in the space to be monitored. The pressure in the space between the tubing and casing (annulus) will be tested initially after the completion of the well to ensure that the well has mechanical integrity and monitored weekly thereafter to ensure that the well maintains mechanical integrity. Any loss of annulus fluid is monitored at least quarterly. If the well should fail a mechanical integrity demonstration, then the well will be shut down until corrective actions have been taken and the well has been brought back into compliance. Any work performed on the well which requires the moving and/or removal of the tubing or packer must be followed by a mechanical integrity test before authorization to resume injection will be given. Under permit conditions, the injection pressure will be limited to ensure the safe operation of the well and monthly reports of pressure and flow rates must be submitted to our office for review. If, despite these safeguards, contamination of drinking water occurs, the operator is fully liable for providing alternate sources of drinking water. In addition, some operators may be willing to work with local residents to respond to problems.

Oilfield brines may contain various amounts of hydrocarbons, such as benzene, ethylbenzene, toluene, xylene, naphthalene, polycyclic aromatic hydrocarbons. Fluids brought to the surface in connection with conventional oil and natural gas production have been exempted from the definition of hazardous waste under the Resource Conservation and Recovery Act under Title 40 of the Code of Federal Regulations (40 CFR) § 261.4(b)(5). Such fluids are naturally occurring fluids that are separated from the oil and/or gas and then returned to the rock formations from which they originated or to a deeper rock formation via Class II injection wells. The UIC program protects USDWs from these fluids by regulating injection wells.

Determination

EPA has determined that the public comments submitted did not raise significant issues which would alter EPA's basis for determining that it is appropriate to issue Chevron Michigan, LLC a permit to operate a Class II injection well. Therefore, EPA is reissuing a final permit to Chevron Michigan, LLC on the date shown at the top of this document.

Comment 1:

Commenter identified that contamination of water wells has occurred in other States as the result of injection well activities and brought up an example in Texas.

Response to Comment 1:

There has not been a documented case of an injection well contaminating an underground source of drinking water since EPA began regulating them. It is true, however, that fluid came to the surface in the Chico, Texas area. To clarify, regulators there determined that the Chico area injection wells were injecting into a small injection zone, which became over-pressurized, forcing fluid up other wells that were not properly constructed or plugged, or had not been identified during permit review. However, there was no documented contamination of an underground source of drinking water by the injection fluid. The injection wells were reworked to access a different injection zone with more capacity, and injection rates were restricted by State regulators.

The circumstances and geologic setting in Michigan and at this well site are different than those in Texas which caused the fluid to rise through conduits. The geology of Michigan is relatively consistent across the state, meaning that rock strata are consistent over a large area. Driller's logs or formation records from nearby wells were used to review geologic data from the area. EPA has data gathered from the hundreds of wells that have been permitted by our office, together with technical studies of the geology of Michigan, such as The Hydrogeologic Atlas of Michigan. EPA has found this well site to be geologically suited for Class II disposal wells. EPA has also determined that the wells within the area of review are properly constructed or plugged. Furthermore, as stated previously, the well will be constructed, maintained and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between USDWs. As a result, there should be no effect on nearby drinking water wells from the operations of this injection well.

Comment 2:

Commenter raised concerns about the recent seismic events in Youngstown, Ohio where 12 low magnitude seismic events occurred as a result of Class II injection well activities.

Response to Comment 2:

The Northstar Class II injection well in Ohio was drilled at a depth of 9192 feet below surface into the Precambrian Period rocks. The evidence gathered by Ohio DNR regulators and geologists suggests that the fluid from a deeply drilled injection well intersected an unmapped fault in a near-failure state of stress causing movement along the fault. In the case of the #MI-009-2D-0217 proposed well, the injection well will be drilled to a shallower formation into the Devonian Period rocks at about 1,535 feet below surface. In addition, based on data available from several decades of experience regulating similar injection wells, there are no documented cases of seismic activities occurring in Antrim County.

Comment 3:

Commenter requested that at a minimum a gamma ray, compensated density-neutron, and resistivity logs be required for all new Class II disposal wells in Michigan.

Response to Comment 3:

In accordance with 40 CFR § 146.22(f)(2)(i) (B) and (ii)(A), only the following logs are required under our current regulations: cement bond, temperature or density log after the casing is set, and an electric porosity and gamma ray log before the casing is installed. These logs are required for all newly drilled Class II disposal wells in areas where the lithology has not been determined.

Comment 4:

Commenter expressed concerns regarding the depth of the injection well and contamination of commenter's drinking water well or future drinking water wells drilled on commenter's property.

Response to Comment 4:

Underground injection wells are designed with multiple safeguards to prevent, minimize, and internally contain leaks within the well. Injection wells are constructed with multiple steel casings cemented into place. Injection takes place through tubing located at the center of the innermost steel casing. A device called a packer seals off the bottom of the tubing, and the space between the innermost steel casing and tubing (called the annulus) is filled with a fluid containing a corrosion inhibitor. To assure that no leaking occurs in the well, the pressure within the annulus space is tested after the well is completed and then re-tested periodically. If this test fails, the well is shut down immediately, and the cause of the leak is isolated and repaired. Once shut down, a successful pressure test must be demonstrated before EPA will allow the operator to resume well injection. The injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between the Underground Sources of Drinking Water (USDW). As a result, there should be no connection between the injection well and nearby drinking water wells or surface

waters. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well is such that injection into the well is environmentally safe. Chevron Michigan, LLC is fully responsible for ensuring the groundwater is protected from contamination due to injection.

Federal Regulations restrict the depth of the injection well to a depth deeper then the lowermost known USDW. This is to insure that the injected fluid does not migrate into the USDW. The Bell Shale is located above the proposed injection formation (i.e., Dundee Limestone). There is approximately 40 feet of Bell Shale separating the injection zone from the lowermost identified USDW. The Bell Shale is a high density rock formation that will confine the injected fluid to the permitted injection zone. Information provided by Chevron indicates that the drinking water wells in the area of the proposed injection well are drilled to an average depth of between 40 feet and 200 feet. The proposed top of the injection zone for this well is located at 1,343 feet below the ground surface. There will be approximately 1,000 feet of low permeability rock layers between the proposed injected fluid and the drinking water aquifer used by residents in the area around the well. These rock layers prevent upward movement of fluid to the lowermost identified USDW and the local drinking water wells.

Comment 5:

Commenter asked how EPA determines that the confining layers are free of known open faults or fractures.

Response to Comment 5:

Driller's logs and formation records from nearby wells and the Hydrogeologic Atlas of Michigan were used to review geologic data from both the confining zone and injection zone. The geology of Michigan is relatively consistent. Data gathered from the wells that have been permitted by our office, together with technical studies of the geology of Michigan demonstrate that the Bell Shale is impermeable and serves as an effective confining zone over most of the State of Michigan. In addition, there is no documentation regarding open faults in Antrim County. Although fractures are much smaller than faults and therefore more difficult to detect, the presence of fractures in a confining zone does not automatically disqualify it as an adequate confining zone. If a fracture was present, injection would have to take place at a sufficient pressure to keep the fracture open. The likelihood of such a pressure being generated, much less maintained, is extremely remote. In addition, the draft permit for this well does not allow the fracturing of any rock formation. EPA has established the maximum permitted injection pressure for this well using the fracture gradient equation. This equation uses a conservative estimate for the fracture gradient and establishes a maximum injection pressure well below the pressure needed to fracture the rock

formation in the confining and injection zones. The draft permit requires Chevron to monitor the injection pressure on a weekly basis and report to EPA on a monthly basis. Injection pressures above the permitted maximum injection pressure would be a violation of the conditions of the permit. Additional operating conditions contained in the draft permit prohibit the fracturing of the confining zone. Violation of any permit condition would subject Chevron Michigan, LLC to an enforcement action by EPA.

Comment 6:

Commenter expressed concerns regarding contamination of the Jordan River from the proposed brine injection, and Commenter identified the Jordan River as designated Wild and Scenic.

Response to Comment 6:

As part of EPA's standard procedure for reviewing permit applications, we verify that the well is not within one-quarter mile of a Federally-designated Wild and Scenic River. The Jordan River is located over 2 miles from the proposed injection well and will not be affected by the injection of brine at this well location. In addition, the Jordan River is not Federally protected, the State of Michigan has designated it as a Natural River. State law requires that Michigan Natural Rivers be protected to a distance of 400 feet from each bank. In addition to a permit from the EPA, operators in Michigan must also receive a permit from the Michigan Department of Environmental Quality (MDEQ). The MDEQ field checks all well locations before issuing permits. Before receiving an MDEQ permit, the well location must conform to MDEQ requirements.

Comment 7:

Commenter expressed concerns regarding the contamination of the drinking water aquifer do to the injection of fluids from the proposed well.

Response to Comment 7:

Underground injection wells are designed with multiple safeguards to prevent, minimize, and internally contain leaks within the well. Injection wells are constructed with multiple steel casings cemented into place. Injection takes place through tubing located at the center of the innermost steel casing. A device called a packer seals off the bottom of the tubing, and the space between the innermost steel casing and tubing (called the annulus) is filled with a fluid containing a corrosion inhibitor. To assure that no leaking occurs in the well, the pressure within the annulus space is tested after the well is completed and then re-tested periodically. If this test fails, the well is shut down immediately, and the cause of the leak is isolated and repaired. Once shut down, a successful pressure test must be demonstrated before EPA will allow the operator to

resume well injection. Although small leaks can happen due to a loss of seal between the packer and the well casing, this does not mean that any fluid leaks out into the drinking water aquifer because the fluid will go into the injection zone. The injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between the Underground Sources of Drinking Water (USDW). As a result, there should be no connection between the injection well and nearby drinking water wells. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well is such that injection into the well is environmentally safe. Chevron Michigan, LLC is fully responsible for ensuring the groundwater is protected from contamination due to injection. The EPA, under the Safe Drinking Water Act, and the Michigan Department of Environmental Quality, under Act 307, can require owners/operators to clean-up any contamination due to injection, and/or supply alternative drinking water sources.

Comment 8:

Commenter expressed concerns regarding contamination of Commenter's property which is designated as a Michigan Historical Site.

Response to Comment 8:

As described above, the injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval. In addition, part of the permit application process investigates the effects, if any, on any cultural or historical properties in the well project area. Chevron Michigan, LLC contacted the Michigan State Historic Preservation Office (SHPO) and submitted information for the proposed injection well project. In a February 15, 2012 letter from SHPO to USEPA, the State of Michigan concluded that "no historic properties are affected" from the proposed injection well project.

Comment 9:

Commenter identified Deer Creek, Deer Lake, the Jordan River, Lake Charlevoix, and Lake Michigan and concerns of contamination of these surface waters from the proposed injection well project.

Response to Comment 9:

As stated above, the injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval. This will prevent the migration of any fluids into and between USDWs, as well as, local streams and rivers. As a result, there should be no connection between the injection well and nearby drinking water wells and local streams and rivers. An EPA permit for an injection well conveys permission to inject fluids based on EPA's

finding that the construction and operation of the well are such that injection will be environmentally safe. In addition, surface spill prevention and remediation are regulated by the Michigan Department of Environmental Quality (MDEQ). The MDEQ also issues permits for underground injection wells within the State of Michigan. The Michigan administrative rules contain requirements regarding well site maintenance and clean-up.

Comment 10:

Commenter expressed concerns regarding the contamination of the drinking water aquifer due to the injection of fluids from the proposed well.

Response to Comment 10:

Underground injection wells are designed with multiple safeguards to prevent, minimize, and internally contain leaks within the well. Injection wells are constructed with multiple steel casings cemented into place. Injection takes place through tubing located at the center of the innermost steel casing. A device called a packer seals off the bottom of the tubing, and the space between the innermost steel casing and tubing (called the annulus) is filled with a fluid containing a corrosion inhibitor. To assure that no leaking occurs in the well, the pressure within the annulus space is tested after the well is completed and then re-tested periodically. If this test fails, the well is shut down immediately, and the cause of the leak is isolated and repaired. Once shut down, a successful pressure test must be demonstrated before EPA will allow the operator to resume well injection. Although small leaks can happen due to a loss of seal between the packer and the well casing, this does not mean that any fluid leaks out into the drinking water aquifer because the fluid will go into the injection zone. The injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between the Underground Sources of Drinking Water (USDW). As a result, there should be no connection between the injection well and nearby drinking water wells. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well is such that injection into the well is environmentally safe. Chevron Michigan, LLC is fully responsible for ensuring the groundwater is protected from contamination due to injection. The EPA, under the Safe Drinking Water Act, and the Michigan Department of Environmental Quality, under Act 307, can require owners/operators to clean-up any contamination due to injection, and/or supply alternative drinking water sources.

Comment 11:

Commenter identified the Jordan River, Lake Charlevoix, and Lake Michigan and concerns of contamination of these surface waters from the proposed injection well project.

Response to Comment 11:

As stated above, the injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval. This will prevent the migration of any fluids into and between USDWs, as well as, local streams and rivers. As a result, there should be no connection between the injection well and nearby drinking water wells and local streams and rivers. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well are such that injection will be environmentally safe. In addition, surface spill prevention and remediation are regulated by the Michigan Department of Environmental Quality (MDEQ). The MDEQ also issues permits for underground injection wells within the State of Michigan. The Michigan administrative rules contain requirements regarding well site maintenance and clean-up.

Comment 12:

Commenter expressed concerns regarding the contamination of the surrounding drinking water wells and surface waters.

Response to Comment 12:

Underground injection wells are designed with multiple safeguards to prevent, minimize, and internally contain leaks within the well. Injection wells are constructed with multiple steel casings cemented into place. Injection takes place through tubing located at the center of the innermost steel casing. A device called a packer seals off the bottom of the tubing, and the space between the innermost steel casing and tubing (called the annulus) is filled with a fluid containing a corrosion inhibitor. To assure that no leaking occurs in the well, the pressure within the annulus space is tested after the well is completed and then re-tested periodically. If this test fails, the well is shut down immediately, and the cause of the leak is isolated and repaired. Once shut down, a successful pressure test must be demonstrated before EPA will allow the operator to resume well injection. Although small leaks can happen due to a loss of seal between the packer and the well casing, this does not mean that any fluid leaks out into the drinking water aquifer because the fluid will go into the injection zone. The injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between the Underground Sources of Drinking Water (USDW). As a result, there should be no connection between the injection well and nearby drinking water wells or surface waters. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well is such that injection into the well is environmentally safe. In addition, surface spill prevention and remediation are regulated by the Michigan Department of Environmental Quality (MDEQ). The MDEQ also issues permits for underground injection wells within the State of Michigan. The Michigan administrative rules contain requirements regarding well site maintenance and

clean-up. Chevron Michigan, LLC is fully responsible for ensuring the groundwater is protected from contamination due to injection. The EPA, under the Safe Drinking Water Act, and the Michigan Department of Environmental Quality, under Act 307, can require owners/operators to clean-up any contamination due to injection, and/or supply alternative drinking water sources.

Comment 13:

Commenter asked if there was a permitted distance between drinking water wells and injection wells.

Response to Comment 13:

The Federal Regulations for underground injection wells do not restrict the surface distance between an injection well and a drinking water well. Federal Regulations restrict the depth of the injection well to a depth deeper then the lowermost known USDW. This is to insure that the injected fluid does not migrate into the USDW. The drinking water wells in the area of the proposed injection well are drilled to an average depth of between 40 feet to 200 feet. The proposed top of the injection zone for the proposed well is located at 1,343 feet below the ground surface. There will be approximately 1,000 feet of low permeability rock layers between the proposed injected fluid and the drinking water aquifer used in the area around the well. These rock layers prevent movement of the injected fluid into the local drinking water wells.

Comment 14:

Commenter asked if brine disposal through injection wells is linked to seismic activity.

Response to Comment 14:

Any seismic activity from disposal well injection would be caused by fracturing any of the rock formations surrounding the well. The draft permit for this well does not allow the fracturing of any rock formation. EPA has established the maximum permitted injection pressure for this well using the fracture gradient equation. This equation uses a conservative estimate for the fracture gradient and establishes a maximum injection pressure well below the pressure needed to fracture the rock formation in the confining and injection zones. The draft permit requires Chevron to monitor the injection pressure on a weekly basis and report to EPA on a monthly basis. Injection pressures above the permitted maximum injection pressure would be a violation of the conditions of the permit. Additional operating conditions contained in the draft permit prohibit the fracturing of the confining zone. Violation of any permit condition would subject Chevron Michigan, LLC to an enforcement action by EPA.

Comment 15:

Commenter asked if there is a history of fluid and/or radiation leakage from wells constructed in the manner proposed by Chevron Michigan, LLC.

Response to Comment 15:

The Safe Drinking Water Act was authorized in 1974 and gave EPA the authority to regulate underground injection for the protection of underground sources of drinking water through the regulation of construction and operation of injection wells. EPA regulations for the Underground Injection Control Program were promulgated in 1980 and insure the use of past and future industry standards for the construction and operation of injection wells that are protective of underground sources of drinking water. There have been no documented failures resulting in contamination of underground sources of drinking water since implementation of the UIC regulations.

Comment 16:

Commenter asked to identify all the chemicals present in the brine.

Response to Comment 16:

The Federal Regulations for Class 2 underground injection wells do not require analysis for all chemicals that may or may not be present in the brine proposed for injection. The permit application and subsequent draft permit allows for the injection of noncommercial brine from production wells owned and operated by Chevron Michigan, LLC. The brine produced by the Chevron production wells originates within oil and gas producing rock formations and has a chemical make-up very similar to the ground water existing at the depth of the proposed injection well. The chemicals contained in the brine that are critical to the injection operation are listed in Special Condition A, "Operating, Monitoring and Reporting Requirements" of the draft permit. The brine produced by the Chevron production wells has a relatively consistent chemical make-up. Also, Chevron is not authorized to inject fluids from any other sources. In order to confirm the chemical make-up of the injected fluid, conditions of the draft permit allow EPA to require injection fluid sampling and analysis at any time. Once injected, the fluid will be confined to the permitted injection zone. Injection of fluid not consistent with the terms of the permit would constitute a violation of the conditions of the permit. Violations of any permit condition would be subject to an enforcement action by EPA.

Comment 17:

Commenter expressed concerns regarding increased noise and vehicle traffic in the area of the proposed injection well.

Response to Comment 17:

EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have an underground injection control (UIC) permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. Vehicle transportation and noise issues are not addressed by the UIC regulations and are outside the scope of the UIC permit process.

Comment 18:

Commenter requested that EPA order Chevron to monitor the water quality of Commenter's drinking water well and plant foliage at Commenter's property line to act as a barrier between the well site and Commenter's property.

Response to Comment 18:

EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. There is no requirement for the permit applicant to test or monitor drinking water wells in the vicinity of the proposed injection well. EPA cannot compel the permit applicant to conduct testing or monitoring of local drinking water wells as part of the permit approval process for this proposed injection well. In addition, there are no requirements in the EPA regulations for the permit applicant to plant foliage as a barrier between the injection well and neighboring properties.

APPEAL

In accordance with 40 C.F.R. § 124.19, any person who filed comments on the draft permit or participated in the public hearing may petition EPA's Environmental Appeals Board for review of the final permit decision. Such a petition shall include a statement of the reasons supporting review of the decision, including a demonstration that the issue(s) being raised for review were raised during the public comment period (including the public hearing) to the extent required by these regulations. The petition should, when appropriate, show that the permit condition(s) being appealed are based upon either: (1) a finding of fact or conclusion of law which is clearly erroneous; or (2) an exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review.

The Environmental Appeals Board issued a remand relating to this permit in *In re Chevron Michigan,* LLC, UIC Appeal No. 12-01 (EAB 2013) on March 5, 2013, and provided that EPA

should reissue this final permit along with a comprehensive response to all comments. A copy of the EAB Remand Order is attached. The EAB stated in its remand order on pages 17-18:

> This Remand Order does not reopen the public comment period. After the Region completes its action on remand, anyone dissatisfied with the Region's actions on remand must file a petition seeking Board review in order to exhaust administrative remedies pursuant to [40 C.F.R. § 124.19(*l*)(2)].[2] Any such petitions shall be limited to those issues addressed by the Region on remand or raised by or in connection with the remand procedures. No new issues may be raised that could have been raised, but were not raised, in the present appeal.

If you wish to request an administrative review, you must submit such a request by regular mail to the Clerk of the Board, U.S. Environmental Protection Agency, Environmental Appeals Board, 1200 Pennsylvania Avenue, Mail Code 1103M, N.W., Washington, D.C. 20460-0001. Requests sent by express mail or hand-delivered must be sent to the Clerk of the Board, U.S. Environmental Protection Agency, Environmental Appeals Board, 1201 Constitution Avenue, NW, U.S. EPA East Building, Room 3334, Washington, D.C. 20004.

The request must arrive at the Board's office on or before AUG 2 7 2013. The request will be timely if received within this time period. For this request to be valid, it must conform to the requirements of 40 C.F.R. §124.19. A copy of these requirements is attached. This request for review must be made prior to seeking judicial review of any permit decision.

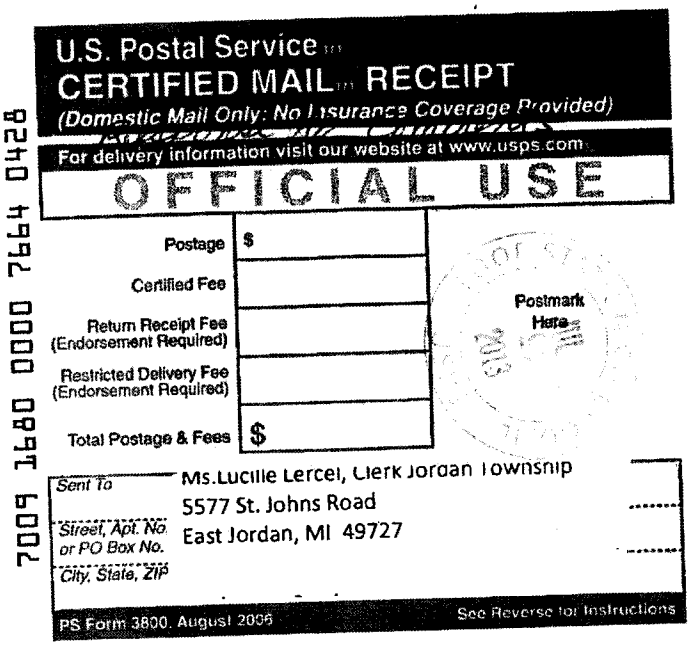
Signed and dated: July 25, 2013

Tinka G. Hyde
Director, Water Division

[2] EPA recently issued a rule revising part 124.19, which became effective on March 26, 2013. Anyone filing a petition for review upon the Region's completion of actions on remand after March 26, 2013, should follow the latest version of § 124.19 in preparing a petition for review. *See* Revisions to Procedural Rules To Clarify Practices and Procedures Applicable in Permit Appeals Pending Before the Environmental Appeals Board, 78 Fed. Reg. 5281 (Jan. 25, 2013). Additional information on this change is available on the Board's website at: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/General+Information/Regulations+Governing+Appeals?OpenDocument

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

B-4 Green card return receipts and certified mail receipts documenting that Response to Comments #2 to was mailed on July 25, 2013, to each of the public commenters



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Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $

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Sent To: Ms.Lucille Lercel, Clerk Jordan Township
Street, Apt. No. or PO Box No.: 5577 St. Johns Road
City, State, ZIP: East Jordan, MI 49727

PS Form 3800, August 2006 See Reverse for Instructions

...se to Comments Barbara WU-167 USC

: COMPLETE THIS SECTION

ete items 1, 2, and 3. Also complete
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our name and address on the reverse
we can return the card to you.
this card to the back of the mailpiece,
ne front if space permits.

ddressed to:

le Lercel, Clerk Jordan Township
Johns Road
lan, MI 49727

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Lucille Lercel ☐ Agent ☐ Addressee

B. Received by (Printed Name): Lucille Lercel
C. Date of Delivery: 7-30-13

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

umber (from service label) 7009 1680 0000 7664 0428

811, February 2004 Domestic Return Receipt 102595-02-M-1540

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Total Postage & Fees	$

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JAN 17 2013
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Sent To: Mr.Lawrence L. Nemecek & Ms. Sandra K. Nemecek
Street, Apt. or PO Box: 5362 St. Johns Road
City, State: East Jordan, MI 49727

PS Form 3800, August 2006 — See Reverse for Instructions

Name to Comments Batka AM-16T (U/C)

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- Complete items 1, 2, and 3. Also complete Restricted Delivery is desired.
- Print your name and address on the reverse so we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Addressed to:

Mr. Lawrence L. Nemecek & Ms. Sandra K. Nemecek
5362 St. Johns Road
East Jordan, MI 49727

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Sandra K Nemecek ☐ Agent ☐ Addressee

B. Received by (Printed Name) Sandra K Nemecek
C. Date of Delivery 1-27-13

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☑ Certified Mail ☐ Express Mail
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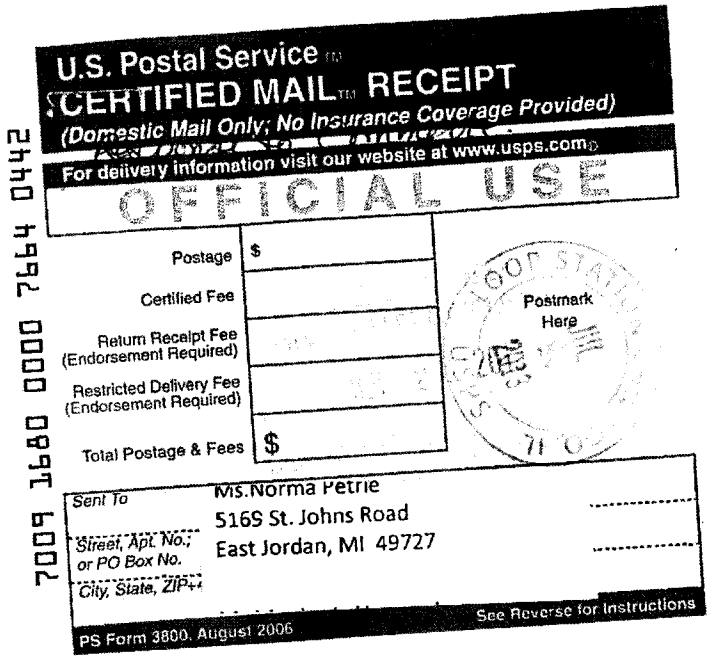
4. Restricted Delivery? (Extra Fee) ☐ Yes

Article Number (Transfer from service label) 7009 1680 0000 7664 0404

PS Form 3811, February 2004 — Domestic Return Receipt — 102595-02-M-1540



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Total Postage & Fees	$

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Sent To: Ms.Norma Petrie
Street, Apt. No.; or PO Box No.: 5165 St. Johns Road
City, State, ZIP+4: East Jordan, MI 49727

PS Form 3800, August 2006 — See Reverse for Instructions

Response to Comments WU-16 U/C

SENDER: COMPLETE THIS SECTION

Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

Article Addressed to:

Ms.Norma Petrie
5169 St. Johns Road
East Jordan, MI 49727

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Norma Petrie ☐ Agent ☑ Addressee

B. Received by (Printed Name): Norma Petrie
C. Date of Delivery: 7-31-13

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☑ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

Article Number (Transfer from service label) 7009 1680 0000 7664 0442

Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

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Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

Sent To: Mr.Peter Bormuth
Street, Apt. No.; or PO Box No.: 142 West Pearl Street
City, State, ZIP+4: Jackson, MI 49201

PS Form 3800, August 2006 — See Reverse for Instructions

Route to Comments Batka WU-165 (U)(C)

SENDER: COMPLETE THIS SECTION

lete items 1, 2, and 3. Also complete
If Restricted Delivery is desired.
our name and address on the reverse
t we can return the card to you.
this card to the back of the mailpiece,
the front if space permits.

Addressed to:

'eter Bormuth
West Pearl Street
son, MI 49201

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☒ Addressee

B. Received by (Printed Name) [signature] C. Date of Delivery 7-27-13

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☑ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

Number
fer from service label) 7009 1680 0000 7664 0411

3811, February 2004 Domestic Return Receipt 102595-02-M-1540

Track & Confirm

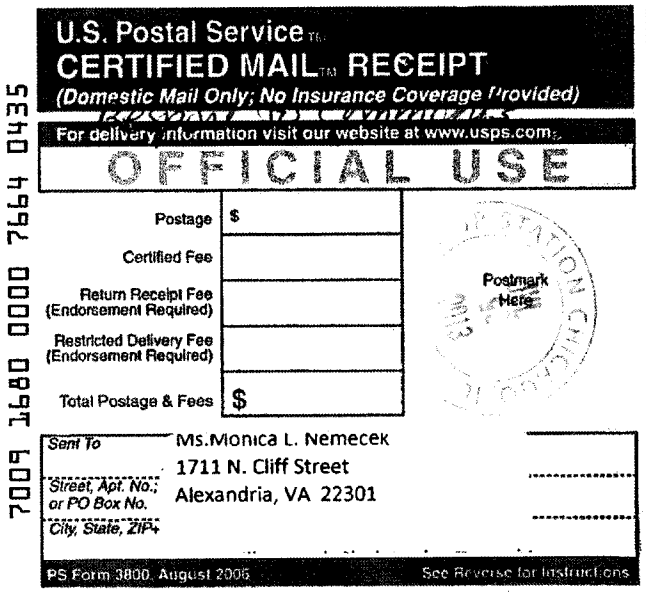
GET EMAIL UPDATES PRINT DETAILS

YOUR LABEL NUMBER	SERVICE	STATUS OF YOUR ITEM	DATE & TIME	LOCATION	FEATURES
70091680000076640435		Notice Left	July 29, 2013, 4:14 pm	ALEXANDRIA, VA 22301	Certified Mail™
		Processed through USPS Sort Facility	July 28, 2013, 11:12 pm	DULLES, VA 20101	
		Depart USPS Sort Facility	July 28, 2013	DULLES, VA 20101	
		Depart USPS Sort Facility	July 26, 2013	BEDFORD PARK, IL 60499	
		Processed through USPS Sort Facility	July 25, 2013, 9:47 pm	BEDFORD PARK, IL 60499	

Check on Another Item

What's your label (or receipt) number?

Find



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Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

Sent To: Ms.Monica L. Nemecek
Street, Apt. No.; or PO Box No.: 1711 N. Cliff Street
City, State, ZIP+: Alexandria, VA 22301

PS Form 3800, August 2006 See Reverse for Instructions

7009 1680 0000 7664 0435

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

B-5 Issuance of Final Permit to Chevron cover letter, dated July 25, 2013, with green card return receipt and certified mail receipt

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUL 2 5 2013

REPLY TO THE ATTENTION OF:
WU-16J

CERTIFIED MAIL 7001 0320 0005 8923 6455
RETURN RECEIPT REQUESTED

Natalie Schrader
Chevron Michigan, LLC
10691 East Carter Road, Suite 201
Traverse City, Michigan 49684

RE: Final Permit for the Stratton #16-4 Well in Antrim County; U. S. Environmental Protection Agency (EPA) Permit NumberMI-009-2D-0217; Michigan Department of Environmental Quality (DEQ) Permit Number 60515

Dear Ms. Schrader:

In compliance with the Environmental Appeals Board's Remand Order, EPA has generated a consolidated Response to Comments document to address all comments received on draft permit number MI-009-2D-0217. The comments did not raise significant issues to modify EPA's determination that the permit application and draft permit meet federal Underground Injection Control requirements. Enclosed is the final permit referenced above. Unless the Environmental Appeals Board receives a petition regarding this final permit decision, as described above, the permit will become effective on the date stamped on Page 1. Provided there are no petitions, construction of the injection well will be authorized to commence on that date and in accordance with permit conditions. Please send the written notification that you have read and are familiar with the conditions of the enclosed permit as required by the permit within 30 days of the receipt of this letter.

After construction of the well has been completed, you must submit EPA Form 7520-10, Completion Report for Brine Disposal, Hydrocarbon Storage or Enhanced Recovery Well, to the Permit Writer by certified mail with return receipt requested, as well as a copy of the results of the mechanical integrity test witnessed by our field inspectors, cementing records or tickets, and any other tests or logs required by the permit. Many useful forms can be found on our web site, http://www.epa.gov/region5/water/uic. Please also submit a copy of the state completion report, which will assist us in our review. We will review all information provided and the Underground Injection Control Branch Chief will notify you in writing whether the well is in compliance and injection is authorized.

In accordance with 40 C.F.R. § 124.19, any person who filed comments on the draft permit or participated in the public hearing may petition EPA's Environmental Appeals Board for review of the final permit decision. Such a petition shall include a statement of the reasons supporting review of the decision, including a demonstration that the issue(s) being raised for review were raised during the public comment period (including the public hearing) to the extent required by these regulations. The petition should, when appropriate, show that the permit condition(s) being appealed are based upon either: (1) a finding of fact or conclusion of law which is clearly erroneous; or (2) an exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review.

The Environmental Appeals Board issued a remand relating to this permit in *In re Chevron Michigan,* LLC, UIC Appeal No. 12-01 (EAB 2013) on March 5, 2013, and provided that EPA should reissue this final permit along with a comprehensive response to all comments. A copy of the EAB Remand Order is attached. The EAB stated in its remand order on pages 17-18:

> This Remand Order does not reopen the public comment period. After the Region completes its action on remand, anyone dissatisfied with the Region's actions on remand must file a petition seeking Board review in order to exhaust administrative remedies pursuant to [40 C.F.R. § 124.19(*l*)(2)].[1] Any such petitions shall be limited to those issues addressed by the Region on remand or raised by or in connection with the remand procedures. No new issues may be raised that could have been raised, but were not raised, in the present appeal.

If you wish to request an administrative review, you must submit such a request by regular mail to the Clerk of the Board, U.S. Environmental Protection Agency, Environmental Appeals Board, 1200 Pennsylvania Avenue, Mail Code 1103M, N.W., Washington, D.C. 20460-0001. Requests sent by express mail or hand-delivered must be sent to the Clerk of the Board, U.S. Environmental Protection Agency, Environmental Appeals Board, 1201 Constitution Avenue, NW, U.S. EPA East Building, Room 3334, Washington, D.C. 20004.

The request must arrive at the Board's office on or before AUG 2 7 2013. The request will be timely if received within this time period. For this request to be valid, it must conform to the requirements of 40 C.F.R. §124.19. A copy of these requirements is attached. This request for review must be made prior to seeking judicial review of any permit decision.

---

1 EPA recently issued a rule revising part 124.19, which became effective on March 26, 2013. Anyone filing a petition for review upon the Region's completion of actions on remand after March 26, 2013, should follow the latest version of § 124.19 in preparing a petition for review. *See* Revisions to Procedural Rules To Clarify Practices and Procedures Applicable in Permit Appeals Pending Before the Environmental Appeals Board, 78 Fed. Reg. 5281 (Jan. 25, 2013). Additional information on this change is available on the Board's website at: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/General+Information/Regulations+Governing+Appeals?OpenDocument

If you have any questions, please contact Allan Batka of my staff by telephone at (312) 353-7316 or by email to batka.allan@epa.gov.

Sincerely yours,

Tinka G. Hyde
Director, Water Division

enclosure

cc: Mark Snow, Michigan DEQ
Sam Williams, AEM Group

MI-009-20-0213 (Response to Comment A) Butler Wildlife Unit

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Ms.Natalie Schrader, Chevron Michigan LLC
10691 East Carter Road, Suite 201
Traverse City, MI 49684

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☑ Agent ☐ Addressee

B. Received by (Printed Name) [illegible] C. Date of Delivery 7/29/13

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7001 0320 0005 8923 6455

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

U.S. Postal Service
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Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

USPS CHICAGO IL 60

Sent To: Ms.Natalie Schrader, Chevron Michigan LLC
Street, Apt. or PO Box: 10691 East Carter Road, Suite 201
City, State: Traverse City, MI 49684

7001 0320 0005 8923 6455

PS Form 3800, January 2001 See Reverse for Instructions

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

B-6 Petitioner's Public Comment on Proposed Chevron Michigan, LLC, Class II Injection Well Draft Permit #MI-009-2D-0217, T31N, R6W, Section 4, ¼ Section SE, Antrim County, Michigan, submitted by Norma Petrie, dated June 4, 2012

June 4, 2012

U.S. Environmental Protection Agency
DI Section (Attn: Lisa Perenchio)
77 West Jackson Boulevard, (WU-16J)
Chicago, IL 60604-3590

Dear Ms. Perenchio;

Last week I received a notice that the EPA plans to issue an injection well permit on property adjacent to mine. This is in Jordan Township, Antrim County, Michigan, and the USEPA Draft Permit # is MI-009-2D-0217. I live in the Jordan Valley, which includes the Jordan River watershed. The headwaters of the Jordan River is nearby, and the Jordan River flows into Lake Charlevoix and hence to Lake Michigan. As you may know, the Jordan River is in the Jordan Valley Management Area, where gas and oil exploration is prohibited. My property has springs and a pond, and in fact the pond is within a few dozen feet of the proposed injection well. What is the distance permitted from water wells to the injection site? We have measured the distance from our home well to the proposed site at less than 400 feet using GPS technology.

I am writing in objection to the proposed injection well due to the possible endangerment of the health and safety of residents. Although I understand the need for disposal of waste from gas drilling, I believe that it is irresponsible of the EPA to issue a permit in an area of such significance in the production of our most precious resource—water. Personally, I am concerned that the health of my children and grandchildren could be compromised by disposal so close to my home and water supply. The scientific evidence regarding deep well injection is inconclusive. Is there a possibility this type of brine disposal may be linked to seismic activity? Is there a history of leakage from wells constructed in this manner? If there is a leak, what is the chance of natural radiation seepage? What chemicals besides those listed for testing might be present in the brine? Overall, we do not know what effect global warming may have on water levels in the Great Lakes and consequently on the movement of the underground water supply in Michigan.

In addition, I am worried about the noise and traffic level that such an activity may produce. How will the waste be transported and what is the timeframe of the entire process? The small highway that serves this location, M-32, is hilly and winding and known as a dangerous stretch of road due to limited visibility. My own property is a Michigan Historical Site, and includes the original log cabin, built in 1887, and the gravesite of two pioneers. It is a unique property.

I request that the EPA reject this permit on the grounds that issuing it would constitute negligence in protecting the health and safety of my family, my home, my neighbors, as well as the vulnerable Jordan River Valley watershed.

Sincerely,

Norma Petrie

Norma Petrie
5169 St. Johns Road
East Jordan, MI 49727
231-536-0891

Cc: USDA, Antrim County Health Department, Michigan Department of Environmental Quality
Addendum

Addendum

June 4, 2012

U.S. Environmental Protection Agency
DI Section (Attn: Lisa Perenchio)
77 West Jackson Bouldevard, (WU-16J)
Chicago, IL 60604-3590

Re: USEPA Draft Permit # MI-009-2D-0217

I am requesting that Chevron be ordered to test my own well before, during, and periodically after drilling so that my family is assured the water can safely be consumed, and that my natural water source is protected during drilling. I am also requesting that Chevron be ordered to plant substantial foliage at the edge of my property which would act as a sound and environmental barrier and would be aesthetically appealing.

Norma Petrie
5169 St. Johns Road
East Jordan, MI 49727
231-536--0891

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

B-7 U.S. EPA, Region 5, Response to Comments submitted by Norma Petrie, dated August 21, 2012 [hereinafter Response to Comments #1]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

AUG 2 1 2012

REPLY TO THE ATTENTION OF
WU-16J

CERTIFIED MAIL 7009 1680 0000 7674 5598
RETURN RECEIPT REQUESTED

Ms. Norma Petrie
5169 St. Johns Road
East Jordan, Michigan 49727

Re: Public Comments on United States Environmental Protection Agency (USEPA) Draft Permit #MI-009-2D-0217

Dear Ms. Petrie:

Thank you for your comments on the draft permit referenced above. We appreciate you taking the time to express your concerns regarding the injection of water in the vicinity of your property.

The scope of the Federal Underground Injection Control (UIC) regulations is limited to the determination of the soundness of construction and operation of injection wells as they relate to the protection of all underground sources of drinking water (USDWs). A USDW is an aquifer or its portion which contains less than 10,000 mg/l of total dissolved solids.

In this case, the proposed well will be drilled to a depth of 1,535 feet below ground surface into the Dundee Limestone. The top of the injection zone is at 1,343 feet. The base of the lowermost USDW has been identified at a depth of 1,301 feet below ground surface and is separated from the top of the Dundee Limestone injection zone by approximately 42 feet of sedimentary rock strata. This rock strata consists of very low permeability rock and will prevent vertical migration of fluid. In addition, all well casing strings are adequately cemented to preclude the movement of fluids into and between USDWs due to injection operations.

As additional protection, injection will take place through tubing which is set within the steel casing. A packer will be set at the bottom of the tubing to seal off the space between the casing and tubing, which will be filled with a liquid mixture containing a corrosion inhibitor, and will allow the pressure in the space to be monitored. The pressure in the space between the tubing and casing (annulus) will be tested initially after the completion of the well to ensure that the well has mechanical integrity and monitored weekly thereafter to ensure that the well maintains mechanical integrity. Any loss of annulus fluid is monitored at least quarterly. If the well should fail a mechanical integrity demonstration, then the well will be shut down until corrective actions

have been taken and the well has been brought back into compliance. Any work performed on the well which requires the moving and/or removal of the tubing or packer must be followed by a mechanical integrity test before authorization to resume injection will be given. Under permit conditions, the injection pressure will be limited to ensure the safe operation of the well and monthly reports of pressure and flow rates must be submitted to our office for review. If, despite these safeguards, contamination of drinking water occurs, the operator is fully liable for providing alternate sources of drinking water. In addition, some operators may be willing to work with local residents to respond to problems.

One of your comments expressed concerns regarding the contamination of the surrounding drinking water wells and surface waters.

Underground injection wells are designed with multiple safeguards to prevent, minimize, and internally contain leaks within the well. Injection wells are constructed with multiple steel casings cemented into place. Injection takes place through tubing located at the center of the innermost steel casing. A device called a packer seals off the bottom of the tubing, and the space between the innermost steel casing and tubing (called the annulus) is filled with a fluid containing a corrosion inhibitor. To assure that no leaking occurs in the well, the pressure within the annulus space is tested after the well is completed and then re-tested periodically. If this test fails, the well is shut down immediately, and the cause of the leak is isolated and repaired. Once shut down, a successful pressure test must be demonstrated before EPA will allow the operator to resume well injection. Although small leaks can happen due to a loss of seal between the packer and the well casing, this does not mean that any fluid leaks out into the drinking water aquifer because the fluid will go into the injection zone. The injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between the Underground Source of Drinking Water (USDW). As a result, there should be no connection between the injection well and nearby drinking water wells or surface waters. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well is such that injection into the well is environmentally safe. In addition, surface spill prevention and remediation are regulated by the Michigan Department of Environmental Quality (MDEQ). The MDEQ also issues permits for underground injection wells within the State of Michigan. The Michigan administrative rules contain requirements regarding well site maintenance and clean-up. Chevron Michigan, LLC is fully responsible for ensuring the groundwater is protected from contamination due to injection. The EPA, under the Safe Drinking Water Act, and the Michigan Department of Environmental Quality, under Act 307, can require owners/operators to clean-up any contamination due to injection, and/or supply alternative drinking water sources.

You asked if there was a permitted distance between drinking water wells and injection wells.

The Federal Regulations for underground injection wells do not restrict the surface distance between an injection well and a drinking water well. Federal Regulations restrict the depth of the injection well to a depth deeper then the lowermost known USDW. This is to insure that the injected fluid does not migrate into the USDW. The drinking water wells in the area of the proposed injection well are drilled to an average depth of between 40 feet to 200 feet. The

proposed top of the injection zone for the proposed well is located at 1,343 feet below the ground surface. There will be approximately 1,000 feet of low permeability rock layers between the proposed injected fluid and the drinking water aquifer used in the area around the well. These rock layers prevent movement of the injected fluid into the local drinking water wells.

You asked if brine disposal through injection wells are linked to seismic activity.

Any seismic activity from disposal well injection would be caused by fracturing any of the rock formations surrounding the well. The draft permit for this well does not allow the fracturing of any rock formation. EPA has established the maximum permitted injection pressure for this well using the fracture gradient equation. This equation uses a conservative estimate for the fracture gradient and establishes a maximum injection pressure well below the pressure needed to fracture the rock formation in the confining and injection zones. The draft permit requires Chevron to monitor the injection pressure on a weekly basis and report to EPA on a monthly basis. Injection pressures above the permitted maximum injection pressure would be a violation of the conditions of the permit. Additional operating conditions contained in the draft permit prohibit the fracturing of the confining zone. Violation of any permit condition would subject Chevron Michigan, LLC to an enforcement action by EPA.

You asked if there is a history of fluid and/or radiation leakage from wells constructed in the manner proposed by Chevron Michigan, LLC.

The Safe Drinking Water Act was authorized in 1974 and gave EPA the authority to regulate underground injection for the protection of underground sources of drinking water through the regulation of construction and operation of injection wells. EPA regulations for the Underground Injection Control Program were promulgated in 1980 and insure the use of past and future industry standards for the construction and operation of injection wells that are protective of underground sources of drinking water. There have been no documented failures resulting in contamination of underground sources of drinking water since implementation of the UIC regulations.

You asked to identify all the chemicals present in the brine.

The Federal Regulations for Class 2 underground injection wells do not require analysis for all chemicals that may or may not be present in the brine proposed for injection. The permit application and subsequent draft permit allows for the injection of noncommercial brine from production wells owned and operated by Chevron Michigan, LLC. The brine produced by the Chevron production wells originates within oil and gas producing rock formations and has a chemical make-up very similar to the ground water existing at the depth of the proposed injection well. The chemicals contained in the brine that are critical to the injection operation are listed in Special Condition A, "Operating, Monitoring and Reporting Requirements" of the draft permit. The brine produced by the Chevron production wells has a relatively consistent chemical make-up. Also, Chevron is not authorized to inject fluids from any other sources. In order to confirm the chemical

make-up of the injected fluid, conditions of the draft permit allow EPA to require injection fluid sampling and analysis at any time. Once injected, the fluid will be confined to the permitted injection zone as described in the first two pages of this letter. Injection of fluid not consistent with the terms of the permit would constitute a violation of the conditions of the permit. Violations of any permit condition would be subject to an enforcement action by EPA.

One of your comments expressed concerns regarding increased noise and vehicle traffic in the area of the proposed injection well.

EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have an underground injection control (UIC) permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. Vehicle transportation and noise issues are not addressed by the UIC regulations and are outside the scope of the UIC permit process.

You requested that EPA order Chevron to monitor the water quality of your drinking water well and plant foliage at your property line to act as a barrier between the well site and your property.

EPA regulations at 40 C.F.R. Parts 144 and 146 state the requirements and standards that a permit applicant must meet to have a UIC permit application approved. These regulations deal primarily with the geologic siting, well engineering, operating, and monitoring standards for deep injection wells. There is no requirement for the permit applicant to test or monitor drinking water wells in the vicinity of the proposed injection well. EPA cannot compel the permit applicant to conduct testing or monitoring of local drinking water wells as part of the permit approval process for this proposed injection well. In addition, there are no requirements in the EPA regulations for the permit applicant to plant foliage as a barrier between the injection well and neighboring properties.

We are taking the opportunity in this letter to serve notice to you that we are proceeding with the issuance of the permit for the well referenced above. In accordance with 40 CFR Section 124.19, any person who filed comments on the draft permit or participated in the public hearing (if held) may petition the Environmental Appeals Board to review any condition of the final permit decision. Such a petition shall include a statement of the reasons supporting review of the decision, including a demonstration that the issue(s) being raised for review were raised during the public comment period (including the public hearing, if held) to the extent required by these regulations. The petition should, when appropriate, show that the permit condition(s) being appealed are based upon either, (1) a finding of fact or conclusion of law which is clearly erroneous, or (2) an exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review. If you wish to request an administrative review, you must submit such a request by regular mail to the United States Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board (MC 1103B), Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460-0001. Requests sent by express mail or hand-delivered must be sent to the United States Environmental

Protection Agency, Clerk of the Board, Environmental Appeals Board, Colorado Building, 1341 G Street, N.W., Suite 600, Washington D.C. 20005. The request must arrive at the Board's office within 30 days of the receipt of this notice of decision. The request will be timely if received within this time period. For this request to be valid, it must conform to the requirements of 40 CFR Section 124.19. A copy of these requirements is attached. This request for review must be made prior to seeking judicial review of any permit decision.

If you have any further questions or concerns, please feel free to contact Allan Batka of my staff at (312) 353-7316 or by e-mail at batka.allan@epa.gov.

Sincerely yours,

Lisa Perenchio, Chief
Direct Implementation Section

Enclosures

AB 8/10/12 DR 8/14/12 LP 8/15/12

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

B-8 U.S. EPA, Region 5, Response to Comments submitted to Peter Bormuth, dated August 15, 2012

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

AUG 15 2012

REPLY TO THE ATTENTION OF:
WU-16J

CERTIFIED MAIL 7009 1680 0000 7644 0141
RETURN RECEIPT REQUESTED

Mr. Peter Bormuth
142 West Pearl Street
Jackson, Michigan 49201

Re: Public Comments on U. S. Environmental Protection Agency (EPA) Draft Permit #MI-009-2D-0217

Dear Mr. Bormuth:

Thank you for your e-mail comments on the draft permit referenced above. We appreciate you taking the time to express your concerns regarding the injection of fluids in Antrim County.

Your e-mail comments reference the West Bay company as the permittee for the #MI-009-2D-0217 proposed injection well. This is incorrect. Chevron Michigan, LLC applied to the EPA for a permit to drill and operate a Class 2 injection well. Your comments also reference an acid stimulation procedure utilizing 3,000 gallons of hydrochloric acid. This is also incorrect. In their Class 2 permit application, Chevron Michigan, LLC did not propose acid stimulation for the #MI-009-2D-0217 proposed well. In addition, your comments reference an "EPA Fact Sheet" for this proposed well that describes the constituents found in brine. EPA did not generate a fact sheet for this proposed well.

Although your comments are not specific to the Chevron Michigan, LLC draft permit #MI-009-2D-0217, EPA will address your comments as generally applied to all Class 2 injection wells.

The scope of the Federal Underground Injection Control (UIC) regulations is limited to the determination of the soundness of construction and operation of injection wells as they relate to the protection of all underground sources of drinking water (USDWs). A USDW is an aquifer or its portion which contains less than 10,000 mg/l of total dissolved solids.

In this case, the proposed well will be drilled to a total depth of 1,535 feet below ground surface into the Dundee Limestone. The top of the Dundee Limestone is at 1,343 feet below ground surface. The base of the lowermost USDW has been identified at a depth of 1,301 feet below ground surface and is separated from the top of the Dundee Limestone injection zone by approximately 42 feet of sedimentary rock strata. All casing strings are adequately cemented to preclude the movement of fluids into and between USDWs due to injection operations. As additional protection, injection will take place through tubing which is set within the steel casing.

A packer will be set at the bottom of the tubing to seal off the space between the casing and tubing, which will be filled with a liquid mixture containing a corrosion inhibitor, and will allow the pressure in the space to be monitored. The pressure in the space between the tubing and casing is monitored and initially tested after the completion of the well to ensure that the well has mechanical integrity and is tested periodically thereafter to ensure that the well maintains mechanical integrity. If a well should fail a mechanical integrity demonstration, then the well will be shut down until corrective actions have been taken and the well has been brought back into compliance. Any work performed on the well which requires the moving and/or removal of the tubing or packer must be followed by a mechanical integrity test before authorization to resume injection will be given. Under permit conditions, the injection pressure will be limited to ensure the safe operation of the well and monthly reports of pressure and flow rates must be submitted to our office for review.

Oilfield brines may contain various amounts of hydrocarbons, such as benzene, ethylbenzene, toluene, xylene, naphthalene, polycyclic aromatic hydrocarbons. Fluids brought to the surface in connection with conventional oil and natural gas production have been exempted from the definition of hazardous waste under the Resource Conservation and Recovery Act under Title 40 of the Code of Federal Regulations (40 CFR) § 261.4(b)(5). Such fluids are naturally occurring fluids that are separated from the oil and/or gas and then returned to the rock formations from which they originated or to a deeper rock formation via Class II injection wells. The UIC program protects USDWs from these fluids by regulating injection wells.

In your letter, you mentioned that contamination of water wells has occurred in other States as the result of injection well activities and brought up an example in Texas. There has not been a documented case of an injection well contaminating an underground source of drinking water since EPA began regulating them. It is true, however, that fluid came to the surface in the Chico, Texas area. To clarify, regulators there determined that the Chico area injection wells were injecting into a small injection zone, which became over-pressurized, forcing fluid up other wells that were not properly constructed or plugged, or had not been identified during permit review. However, there was no documented contamination of an underground source of drinking water by the injection fluid. The injection wells were reworked to access a different injection zone with more capacity, and injection rates were restricted by State regulators.

The circumstances and geologic setting in Michigan and at this well site are different than those in Texas which caused the fluid to rise through conduits. The geology of Michigan is relatively consistent across the state, meaning that rock strata are consistent over a large area. Driller's logs or formation records from nearby wells were used to review geologic data from the area. EPA has data gathered from the hundreds of wells that have been permitted by our office, together with technical studies of the geology of Michigan, such as The Hydrogeologic Atlas of Michigan. EPA has found this well site to be geologically suited for Class II disposal wells. EPA has also determined that the wells within the area or review are properly constructed or plugged. Furthermore, as stated previously, the well will be constructed, maintained and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between USDWs. As a result, there should be no effect on nearby drinking water wells from the operations of this injection well.

In your letter, you have raised concerns about the recent seismic events in Youngstown, Ohio where 12 low magnitude seismic events occurred as a result of Class II injection well activities. The Northstar Class II injection well in Ohio was drilled at a depth of 9192 feet below surface into the Precambrian Period rocks. The evidence gathered by Ohio DNR regulators and geologists suggests that the fluid from a deeply drilled injection well intersected an unmapped fault in a near-failure state of stress causing movement along the fault. In the case of the #MI-009-2D-0217 proposed well, the injection well will be drilled to a shallower formation into the Devonian Period rocks at about 1,535 feet below surface. In addition, based on data available from several decades of experience regulating similar injection wells, there are no documented cases of seismic activities occurring in Antrim County.

In your e-mail, you requested that at a minimum a gamma ray, compensated density-neutron, and resistivity logs be required for all new Class II disposal wells in Michigan. In accordance with 40 CFR § 146.22(f)(2)(i) (B) and (ii)(A), only the following logs are required under our current regulations: cement bond, temperature or density log after the casing is set, and an electric porosity and gamma ray log before the casing is installed. These logs are required for all newly drilled Class II disposal wells in areas where the lithology has not been determined.

We are taking the opportunity in this letter to serve notice to you that we are proceeding with the issuance of the permit for the well referenced above. In accordance with Title 40 of the Code of Federal Regulations (40 CFR) §124.19, any person who filed comments on the draft permit or participated in the public hearing (if held) may petition the Environmental Appeals Board to review any condition of the final permit decision. Such a petition shall include a statement of the reasons supporting review of the decision, including a demonstration that the issue(s) being raised for review were raised during the public comment period (including the public hearing, if held) to the extent required by these regulations. The petition should, when appropriate, show that the permit condition(s) being appealed are based upon either, (1) a finding of fact or conclusion of law which is clearly erroneous, or (2) an exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review. If you wish to request an administrative review, you must submit such a request by regular mail to the United States Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board (MC 1103B), Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460-0001. Requests sent by express mail or hand-delivered must be sent to the United States Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board, Colorado Building 1341 G Street, NW, Suite 600, Washington, D.C. 20005. The request must arrive at the Board's office within 30 days of the receipt of this notice of decision. The request will be timely if received within this time period. For this request to be valid, it must conform to the requirements of 40 CFR §124.19. A copy of these requirements is attached. This request for review must be made prior to seeking judicial review of any permit decision.

If you have any further questions or concerns, please feel free to contact Allan Batka of my staff at (312) 353-7316.

Sincerely yours,

Lisa Perenchio, Chief
Direct Implementation Section

enclosure

AB 8/1-/12
LP 8/14/12 LP 8/15/12

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

B-9 U.S. EPA, Region 5, Response to Comments submitted to Monica Nemecek, dated August 15, 2012

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

AUG 15 2012

REPLY TO THE ATTENTION OF
WU-16J

CERTIFIED MAIL 7009 1680 0000 7674 5611
RETURN RECEIPT REQUESTED

Ms. Monica L. Nemecek
1711 N. Cliff Street
Alexandria, Virginia 22301

Re: Public Comments on United States Environmental Protection Agency (USEPA) Draft Permit #MI-009-2D-0217

Dear Ms. Nemecek:

Thank you for your comments on the draft permit referenced above. We appreciate you taking the time to express your concerns regarding the injection of water in the vicinity of your property.

The scope of the Federal Underground Injection Control (UIC) regulations is limited to the determination of the soundness of construction and operation of injection wells as they relate to the protection of all underground sources of drinking water (USDWs). A USDW is an aquifer or its portion which contains less than 10,000 mg/l of total dissolved solids.

In this case, the proposed well will be drilled to a depth of 1,535 feet below ground surface into the Dundee Limestone. The top of the injection zone is at 1,343 feet. The base of the lowermost USDW has been identified at a depth of 1,301 feet below ground surface and is separated from the top of the Dundee Limestone injection zone by approximately 42 feet of sedimentary rock strata. This rock strata consists of very low permeability rock and will prevent vertical migration of fluid. In addition, all well casing strings are adequately cemented to preclude the movement of fluids into and between USDWs due to injection operations.

As additional protection, injection will take place through tubing which is set within the steel casing. A packer will be set at the bottom of the tubing to seal off the space between the casing and tubing, which will be filled with a liquid mixture containing a corrosion inhibitor, and will allow the pressure in the space to be monitored. The pressure in the space between the tubing and casing (annulus) will be tested initially after the completion of the well to ensure that the well has mechanical integrity and monitored weekly thereafter to ensure that the well maintains mechanical integrity. Any loss of annulus fluid is monitored at least quarterly. If the well should fail a mechanical integrity demonstration, then the well will be shut down until corrective actions

have been taken and the well has been brought back into compliance. Any work performed on the well which requires the moving and/or removal of the tubing or packer must be followed by a mechanical integrity test before authorization to resume injection will be given. Under permit conditions, the injection pressure will be limited to ensure the safe operation of the well and monthly reports of pressure and flow rates must be submitted to our office for review. If, despite these safeguards, contamination of drinking water occurs, the operator is fully liable for providing alternate sources of drinking water. In addition, some operators may be willing to work with local residents to respond to problems.

Your comments expressed concerns regarding the depth of the injection well and contamination of your drinking water well or future drinking water wells drilled on your property.

Underground injection wells are designed with multiple safeguards to prevent, minimize, and internally contain leaks within the well. Injection wells are constructed with multiple steel casings cemented into place. Injection takes place through tubing located at the center of the innermost steel casing. A device called a packer seals off the bottom of the tubing, and the space between the innermost steel casing and tubing (called the annulus) is filled with a fluid containing a corrosion inhibitor. To assure that no leaking occurs in the well, the pressure within the annulus space is tested after the well is completed and then re-tested periodically. If this test fails, the well is shut down immediately, and the cause of the leak is isolated and repaired. Once shut down, a successful pressure test must be demonstrated before EPA will allow the operator to resume well injection. The injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between the Underground Source of Drinking Water (USDW). As a result, there should be no connection between the injection well and nearby drinking water wells or surface waters. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well is such that injection into the well is environmentally safe. Chevron Michigan, LLC is fully responsible for ensuring the groundwater is protected from contamination due to injection.

Federal Regulations restrict the depth of the injection well to a depth deeper then the lowermost known USDW. This is to insure that the injected fluid does not migrate into the USDW. The Bell Shale is located above the proposed injection formation (i.e., Dundee Limestone). There is approximately 40 feet of Bell Shale separating the injection zone from the lowermost identified USDW. The Bell Shale is a high density rock formation that will confine the injected fluid to the permitted injection zone. Information provided by Chevron indicates that the drinking water wells in the area of the proposed injection well are drilled to an average depth of between 40 feet and 200 feet. The proposed top of the injection zone for this well is located at 1,343 feet below the ground surface. There will be approximately 1,000 feet of low permeability rock layers between the proposed injected fluid and the drinking water aquifer used by residents in the area around the well. These rock layers prevent upward movement of fluid to the lowermost identified USDW and the local drinking water wells.

You asked how EPA determines that the confining layers are free of known open faults or fractures.

Driller's logs and formation records from nearby wells and the Hydrogeologic Atlas of Michigan were used to review geologic data from both the confining zone and injection zone. The geology of Michigan is relatively consistent. Data gathered from the wells that have been permitted by our office, together with technical studies of the geology of Michigan demonstrates that the Bell Shale is impermeable and serves as an effective confining zone over most of the State of Michigan. In addition, there is no documentation regarding open faults in Antrim County. Although fractures are much smaller than faults and therefore more difficult to detect, the presence of fractures in a confining zone does not automatically disqualify it as an adequate confining zone. If a fracture was present, injection would have to take place at a sufficient pressure to keep the fracture open. The likelihood of such a pressure being generated, much less maintained, is extremely remote. In addition, the draft permit for this well does not allow the fracturing of any rock formation. EPA has established the maximum permitted injection pressure for this well using the fracture gradient equation. This equation uses a conservative estimate for the fracture gradient and establishes a maximum injection pressure well below the pressure needed to fracture the rock formation in the confining and injection zones. The draft permit requires Chevron to monitor the injection pressure on a weekly basis and report to EPA on a monthly basis. Injection pressures above the permitted maximum injection pressure would be a violation of the conditions of the permit. Additional operating conditions contained in the draft permit prohibit the fracturing of the confining zone. Violation of any permit condition would subject Chevron Michigan, LLC to an enforcement action by EPA.

Your comment expresses concerns of contamination of the Jordan River from the proposed brine injection, and you identify the Jordan River as designated Wild and Scenic.

As part of EPA's standard procedure for reviewing permit applications, we verify that the well is not within one-quarter mile of a Federally-designated Wild and Scenic River. The Jordan River is located over 2 miles from the proposed injection well and will not be affected by the injection of brine at this well location. In addition, the Jordan River is not Federally protected, the State of Michigan has designated it as a Natural River. State law requires that Michigan Natural Rivers be protected to a distance of 400 feet from each bank. In addition to a permit from the EPA, operators in Michigan must also receive a permit from the Michigan Department of Environmental Quality (MDEQ). The MDEQ field checks all well locations before issuing permits. Before receiving an MDEQ permit, the well location must conform to MDEQ requirements.

We are taking the opportunity in this letter to serve notice to you that we are proceeding with the issuance of the permit for the well referenced above. In accordance with 40 CFR Section 124.19, any person who filed comments on the draft permit or participated in the public hearing (if held) may petition the Environmental Appeals Board to review any condition of the final permit decision. Such a petition shall include a statement of the reasons supporting review of the

decision, including a demonstration that the issue(s) being raised for review were raised during the public comment period (including the public hearing, if held) to the extent required by these regulations. The petition should, when appropriate, show that the permit condition(s) being appealed are based upon either, (1) a finding of fact or conclusion of law which is clearly erroneous, or (2) an exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review. If you wish to request an administrative review, you must submit such a request by regular mail to the United States Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board (MC 1103B), Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460-0001. Requests sent by express mail or hand-delivered must be sent to the United States Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board, Colorado Building, 1341 G Street, N.W., Suite 600, Washington D.C. 20005. The request must arrive at the Board's office within 30 days of the receipt of this notice of decision. The request will be timely if received within this time period. For this request to be valid, it must conform to the requirements of 40 CFR Section 124.19. A copy of these requirements is attached. This request for review must be made prior to seeking judicial review of any permit decision.

If you have any further questions or concerns, please feel free to contact Allan Batka of my staff at (312) 353-7316 or by e-mail at batka.allan@epa.gov.

Sincerely yours,

Lisa Perenchio, Chief
Direct Implementation Section

Enclosures

AB 8/10/12
8/14/12 8/15/12

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

B-10 U.S. EPA, Region 5, Response to Comments submitted to Lawrence and Sandra Nemecek, dated August 21, 2012

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

AUG 2 1 2012

REPLY TO THE ATTENTION OF
WU-16J

CERTIFIED MAIL 7009 1680 0000 7674 5574
RETURN RECEIPT REQUESTED

Lawrence L. Nemecek
Sandra K. Nemecek
5362 St. Johns Road
East Jordan, Michigan 49727

Re: Public Comments on United States Environmental Protection Agency (USEPA) Draft Permit #MI-009-2D-0217

Dear Lawrence and Sandra Nemecek:

Thank you for your comments on the draft permit referenced above. We appreciate you taking the time to express your concerns regarding the injection of water in the vicinity of your property.

The scope of the Federal Underground Injection Control (UIC) regulations is limited to the determination of the soundness of construction and operation of injection wells as they relate to the protection of all underground sources of drinking water (USDWs). A USDW is an aquifer or its portion which contains less than 10,000 mg/l of total dissolved solids.

In this case, the proposed well will be drilled to a depth of 1,535 feet below ground surface into the Dundee Limestone. The top of the injection zone is at 1,343 feet. The base of the lowermost USDW has been identified at a depth of 1,301 feet below ground surface and is separated from the top of the Dundee Limestone injection zone by approximately 42 feet of sedimentary rock strata. This rock strata consists of very low permeability rock and will prevent vertical migration of fluid. In addition, all well casing strings are adequately cemented to preclude the movement of fluids into and between USDWs due to injection operations.

As additional protection, injection will take place through tubing which is set within the steel casing. A packer will be set at the bottom of the tubing to seal off the space between the casing and tubing, which will be filled with a liquid mixture containing a corrosion inhibitor, and will allow the pressure in the space to be monitored. The pressure in the space between the tubing and casing (annulus) will be tested initially after the completion of the well to ensure that the well has mechanical integrity and monitored weekly thereafter to ensure that the well maintains mechanical integrity. Any loss of annulus fluid is monitored at least quarterly. If the well should

fail a mechanical integrity demonstration, then the well will be shut down until corrective actions have been taken and the well has been brought back into compliance. Any work performed on the well which requires the moving and/or removal of the tubing or packer must be followed by a mechanical integrity test before authorization to resume injection will be given. Under permit conditions, the injection pressure will be limited to ensure the safe operation of the well and monthly reports of pressure and flow rates must be submitted to our office for review. If, despite these safeguards, contamination of drinking water occurs, the operator is fully liable for providing alternate sources of drinking water. In addition, some operators may be willing to work with local residents to respond to problems.

Your first comment expressed concerns regarding the contamination of the drinking water aquifer do to the injection of fluids from the proposed well.

Underground injection wells are designed with multiple safeguards to prevent, minimize, and internally contain leaks within the well. Injection wells are constructed with multiple steel casings cemented into place. Injection takes place through tubing located at the center of the innermost steel casing. A device called a packer seals off the bottom of the tubing, and the space between the innermost steel casing and tubing (called the annulus) is filled with a fluid containing a corrosion inhibitor. To assure that no leaking occurs in the well, the pressure within the annulus space is tested after the well is completed and then re-tested periodically. If this test fails, the well is shut down immediately, and the cause of the leak is isolated and repaired. Once shut down, a successful pressure test must be demonstrated before EPA will allow the operator to resume well injection. Although small leaks can happen due to a loss of seal between the packer and the well casing, this does not mean that any fluid leaks out into the drinking water aquifer because the fluid will go into the injection zone. The injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between the Underground Source of Drinking Water (USDW). As a result, there should be no connection between the injection well and nearby drinking water wells. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well is such that injection into the well is environmentally safe. Chevron Michigan, LLC is fully responsible for ensuring the groundwater is protected from contamination due to injection. The EPA, under the Safe Drinking Water Act, and the Michigan Department of Environmental Quality, under Act 307, can require owners/operators to clean-up any contamination due to injection, and/or supply alternative drinking water sources.

Your second comment expressed concerns regarding contamination of your property which is designated as a Michigan Historical Site.

As described above, the injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval. In addition, part of the permit application process investigates the effects, if any, on any cultural or historical properties in the well project area. Chevron Michigan, LLC contacted the Michigan State Historic Preservation Office (SHPO) and submitted information for the proposed injection well project. In a February 15, 2012 letter from SHPO to USEPA, the State of

Michigan concluded that "no historic properties are affected" from the proposed injection well project. A copy of the SHPO letter is enclosed for your information.

Your third and fourth comments identified Deer Creek, Deer Lake, the Jordan River, Lake Charlevoix, and Lake Michigan and your concern of contamination of these surface waters from the proposed injection well project.

As stated above, the injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval. This will prevent the migration of any fluids into and between USDWs, as well as, local streams and rivers. As a result, there should be no connection between the injection well and nearby drinking water wells and local streams and rivers. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well are such that injection will be environmentally safe. In addition, surface spill prevention and remediation are regulated by the Michigan Department of Environmental Quality (MDEQ). The MDEQ also issues permits for underground injection wells within the State of Michigan. The Michigan administrative rules contain requirements regarding well site maintenance and clean-up.

We are taking the opportunity in this letter to serve notice to you that we are proceeding with the issuance of the permit for the well referenced above. In accordance with 40 CFR Section 124.19, any person who filed comments on the draft permit or participated in the public hearing (if held) may petition the Environmental Appeals Board to review any condition of the final permit decision. Such a petition shall include a statement of the reasons supporting review of the decision, including a demonstration that the issue(s) being raised for review were raised during the public comment period (including the public hearing, if held) to the extent required by these regulations. The petition should, when appropriate, show that the permit condition(s) being appealed are based upon either, (1) a finding of fact or conclusion of law which is clearly erroneous, or (2) an exercise of discretion or an important policy consideration which the Environmental Appeals Board should, in its discretion, review. If you wish to request an administrative review, you must submit such a request by regular mail to the United States Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board (MC 1103B), Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460-0001. Requests sent by express mail or hand-delivered must be sent to the United States Environmental Protection Agency, Clerk of the Board, Environmental Appeals Board, Colorado Building, 1341 G Street, N.W., Suite 600, Washington D.C. 20005. The request must arrive at the Board's office within 30 days of the receipt of this notice of decision. The request will be timely if received within this time period. For this request to be valid, it must conform to the requirements of 40 CFR Section 124.19. A copy of these requirements is attached. This request for review must be made prior to seeking judicial review of any permit decision.

If you have any further questions or concerns, please feel free to contact Allan Batka of my staff at (312) 353-7316 or by e-mail at batka.allan@epa.gov.

Sincerely yours,

Lisa Perenchio, Chief
Direct Implementation Section

Enclosures

AB 8/15/12 LP 8/15/12

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

B-11 U.S. EPA, Region 5, Response to Comments submitted to Lucille Lercel, dated August 15, 2012

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

AUG 15 2012

REPLY TO THE ATTENTION OF
WU-16J

CERTIFIED MAIL 7009 1680 0000 7674 5581
RETURN RECEIPT REQUESTED

Lucille Lercel, Clerk
Jordan Township
5577 St. Johns Road
East Jordan, Michigan 49727

Re: Public Comments on United States Environmental Protection Agency (USEPA) Draft Permit #MI-009-2D-0217

Dear Ms. Lercel:

Thank you for your comments on the draft permit referenced above. We appreciate you taking the time to express your concerns regarding the injection of water in the vicinity of your property.

The scope of the Federal Underground Injection Control (UIC) regulations is limited to the determination of the soundness of construction and operation of injection wells as they relate to the protection of all underground sources of drinking water (USDWs). A USDW is an aquifer or its portion which contains less than 10,000 mg/l of total dissolved solids.

In this case, the proposed well will be drilled to a depth of 1,535 feet below ground surface into the Dundee Limestone. The top of the injection zone is at 1,343 feet. The base of the lowermost USDW has been identified at a depth of 1,301 feet below ground surface and is separated from the top of the Dundee Limestone injection zone by approximately 42 feet of sedimentary rock strata. This rock strata consists of very low permeability rock and will prevent vertical migration of fluid. In addition, all well casing strings are adequately cemented to preclude the movement of fluids into and between USDWs due to injection operations.

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fail a mechanical integrity demonstration, then the well will be shut down until corrective actions have been taken and the well has been brought back into compliance. Any work performed on the well which requires the moving and/or removal of the tubing or packer must be followed by a mechanical integrity test before authorization to resume injection will be given. Under permit conditions, the injection pressure will be limited to ensure the safe operation of the well and monthly reports of pressure and flow rates must be submitted to our office for review. If, despite these safeguards, contamination of drinking water occurs, the operator is fully liable for providing alternate sources of drinking water. In addition, some operators may be willing to work with local residents to respond to problems.

Your first comment expressed concerns regarding the contamination of the drinking water aquifer due to the injection of fluids from the proposed well.

Underground injection wells are designed with multiple safeguards to prevent, minimize, and internally contain leaks within the well. Injection wells are constructed with multiple steel casings cemented into place. Injection takes place through tubing located at the center of the innermost steel casing. A device called a packer seals off the bottom of the tubing, and the space between the innermost steel casing and tubing (called the annulus) is filled with a fluid containing a corrosion inhibitor. To assure that no leaking occurs in the well, the pressure within the annulus space is tested after the well is completed and then re-tested periodically. If this test fails, the well is shut down immediately, and the cause of the leak is isolated and repaired. Once shut down, a successful pressure test must be demonstrated before EPA will allow the operator to resume well injection. Although small leaks can happen due to a loss of seal between the packer and the well casing, this does not mean that any fluid leaks out into the drinking water aquifer because the fluid will go into the injection zone. The injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval and prevent the migration of any fluids into and between the Underground Source of Drinking Water (USDW). As a result, there should be no connection between the injection well and nearby drinking water wells. An EPA permit for an injection well conveys permission to inject fluids based on EPA's finding that the construction and operation of the well is such that injection into the well is environmentally safe. Chevron Michigan, LLC is fully responsible for ensuring the groundwater is protected from contamination due to injection. The EPA, under the Safe Drinking Water Act, and the Michigan Department of Environmental Quality, under Act 307, can require owners/operators to clean-up any contamination due to injection, and/or supply alternative drinking water sources.

Your second comment identified the Jordan River, Lake Charlevoix, and Lake Michigan and your concern of contamination of these surface waters from the proposed injection well project.

As stated above, the injection well will be constructed and operated in such a manner so as to confine the injected fluids to the permitted interval. This will prevent the migration of any fluids into and between USDWs, as well as, local streams and rivers. As a result, there should be no connection between the injection well and nearby drinking water wells and local streams and rivers. An EPA permit for an injection well conveys permission to inject fluids based on EPA's

finding that the construction and operation of the well are such that injection will be environmentally safe. In addition, surface spill prevention and remediation are regulated by the Michigan Department of Environmental Quality (MDEQ). The MDEQ also issues permits for underground injection wells within the State of Michigan. The Michigan administrative rules contain requirements regarding well site maintenance and clean-up.

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If you have any further questions or concerns, please feel free to contact Allan Batka of my staff at (312) 353-7316 or by e-mail at batka.allan@epa.gov.

Sincerely yours,

Lisa Perenchio, Chief
Direct Implementation Section

Enclosures

8/10/12 8/14/12 8/15/12