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**west virginia** department of environmental protection

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Office of Oil and Gas  
601 57th Street SE  
Charleston, WV 25304  
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Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

**UIC Permit Reissuance**

EXCO RESOURCES (PA), LLC  
260 executive drive  
Cranberry township, PA 16066-

Dear TERRY AND DIANN.

Enclosed you will find the Underground Injection Control Renewal Permit # UIC2D0392419 dated October 16, 2015. Be advised that the duration of the permit is for a period of five (5) years.

Also be advised that all conditions established by the UIC Permit Number UIC2D0392419 either expressly or incorporated by reference, must be strictly adhered to. All monitoring forms shall be submitted to the Office of Oil and Gas in the manner and frequency prescribed. The monitoring forms will be compared with the scope of the permitted activity to verify compliance.

Please review the permit carefully and be aware of all permit conditions. Compliance of all permit conditions will be strictly enforced.

The operation of this injection well facility in general, including maintenance of all related surface equipment, shall be conducted so as to preclude any unlawful discharge of waste materials into the surface or ground waters of the state.

James Martin  
Chief,  
Office of Oil and Gas

Enclosures as stated



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## EXCO Resources (PA), LLC Comments and Response to Comments and Final UIC Permit.

On July 17, 2015, the Draft Underground Injection Control Permit No. **UIC2D0392419** and was presented to the public for a 30 day review and comment period as required by Legislative Rule 47-13. The following is a summary of written and verbal comment received during the comment period.

1. *Permit Authorization Page:* The Authorization page uses the location of the perforations in the Salt Sands. The Salt Sands are an extensive formation, about 457 feet thick (between 1360 to 1817 feet below the surface) according to the 1969 completion report for the well. Locating the injection to between 1568 and 1674 feet below the surface (106 feet thick) makes sense in this case, but does affect Area of Review calculations.

DEP Response: The depth interval (1,568' to 1,674') provided on the authorization page is representative of the injection zone being utilized by 2D0392419. Upon review of the gamma-density geophysical log (available at WVGES Pipeline) API well 47-039-02419 is perforated into a lower zone within the undifferentiated Salt Sands formation. This lower "clean" and relatively porous sandstone injection zone exists from approximately 1552' to 1696' and confined by an overlying shale layer from 1,494' to 1,552' (~58' thick). After review of said geophysical logs, the Office of Oil and Gas's determined the perforated interval provided by the applicant was more accurate as to where the injection fluids will be contained.

2. *Part I – D Effect of Permit:* There is a minor error in this condition. 40 CFR Chapter 1, Part 142 should be changed to 40 CFR Chapter 1, Part 141.

DEP Response: Draft permit 2D0392419 permit contains the correct reference, using 40 CFR Chapter 1 Part 142. 40 CFR 142.1 – Applicability directly references the 40CFR 141 as the national primary drinking water regulatory criteria that shall be enforced by the WVDEP.

### *§142.1 Applicability.*

*This part sets forth, pursuant to sections 1413 through 1416, 1445, and 1450 of the Public Health Service Act, as amended by the Safe Drinking Water Act, Public Law 93-523, regulations for the implementation and enforcement of the national primary drinking water regulations contained in part 141 of this chapter.*

3. *Part I – H General Conditions H.16* We approve of the addition of this condition which is not found in previous permits. We are as concerned with what might happen on the surface due to spills as what might happen underground due to improper underground injection.

Promoting a healthy environment.

Activities on the surface at UIC2D0392210 caused severe groundwater contamination which has since been remediated.

There is one spelling correction and a clarification needed here:

*... crude oil, or seepage [not septage], or natural gas fluids or condensate, ...*

DEP Response: The Office of Oil and Gas acknowledges your comment and the change has been incorporated into the final permit.

4. *Part II – Monitoring Requirements B.5* We approve of this addition to the permit for required fluid analysis. The operator's fluid sample analysis was conducted in 2013 and does not conform to the constituent requirements found in the most recent UIC Permit Application and Guidance Package. It also does not conform to the constituent requirement we have found in the earlier application and guidance package where a test is required for specific gravity, or for the list of constituents in Attachment A of earlier permits.

B.6 The permit's injection fluid lab analysis parameters (Table 1) is not protective and does not show the range of constituents characteristic of the fluids the operator is injecting. This permit condition requires lab analysis of fluid only once every five years. Region 3's non-commercial permit requires testing a sample every 2 years which we believe is more useful, especially considering condition B.7.

The permit application package has its own list of parameters which is better suited for the range of fluids injected in this state.

DEP Response: The permittee had originally submitted a UIC permit application prior to the Office's parameter list change. Consequently we will accept previous analytical data as well as previous analytical parameter requirements from the original UIC permit application. The Office of Oil and Gas believes these parameters characterize the injection fluid. Also, the specific gravity value was provided in the UIC permit application package. The value is located in the EPA "Prescone" induced pressure model spreadsheet. The submitted specific gravity is 1.08, within a common brine fluid specific gravity range. Lastly, the Class 2 disposal underground injection control permit requires the operator to notify the Office if the injection fluid specific gravity is above 1.2, preventing formation breakdown due to fluid weight fluctuations.

5. *B.10* We approve of the pipeline MIT condition, but wish the tests were required annually instead of every 5 years.

DEP Response: The Office of Oil and Gas (OOG) believes that the required five (5) year testing period of the mechanical integrity of the pipelines is sufficient.

6. *B.11* We believe an addition is required to this condition to help differentiate it from the previous condition:

*... integrity test of the injection well at a minimum ...*

DEP Response: The Office of Oil and Gas acknowledges your comment and the change has been incorporated into the final permit.

7. We also think that text from the prior condition could also be included in this condition:

The injection well integrity test shall pressurize the well's tubing annulus to 1.5 times the maximum permitted wellhead injection pressure for a minimum of thirty (30) minutes, allowing for no more than five (5) percent pressure loss after completion.

DEP Response: The Office of Oil and Gas requires the operator to perform a mechanical integrity test (MIT) in accordance with 47 CSR 13.6.2. This can be satisfied by an approved method that does not directly pressure test the tubing, packer and production string construction, as outlined above.

8. *B.12* An addition of a verb is needed for this condition:  
... if well failure is likely, ...

DEP Response: The Office of Oil and Gas acknowledges your comment and the change has been incorporated into the final permit.

9. *Since Part III – A Operating Requirements A.2* We believe this condition's wording can be improved for clarity and grammar:

Any well, with an inactive and/or abandoned status within the permitted Area of Review, that penetrates the injection zone and does not have cemented casing through the injection zone, shall be monitored immediately by a method approved by the Office of Oil and Gas. Any well shut-in for more than one (1) year shall be considered abandoned and shall be plugged immediately.

DEP Response: The Office of Oil and Gas (OOG) believes that Part III – Operating Requirements A.2 is written sufficiently to protect USDWs from abandoned and/or inactive wells within the permitted Area of Review.

10. *4.5* We are extremely concerned about unloading stations at this and other UIC wells where fluid is transferred from truck to tanks over soil or gravel rather than a cement pad with curbs. The facility plan for this well does not show a proper unloading pad. Injection should be halted until the facility has been upgraded.

DEP Response: This UIC permit contains three operating requirements that should address your concern. The following requirements can be found in Part III of this permit:

5. Loading and unloading stations shall have spill prevention and control facilities and procedures as well as secondary containment. Spill containment and cleanup equipment shall be readily accessible.
8. Pumps and ancillary equipment (e.g. valves, flanges, filters, condensate lines and instrumentation) handling materials that have the potential to contaminate groundwater shall be selected and installed to prevent or contain any spills or leaks.
9. Sumps containing materials which have the potential to contaminate groundwater shall be designed, constructed, and operated utilizing leak detection or secondary containment, or other appropriate controls that are capable of preventing groundwater contamination.

11. *A.7* We approve of a condition requiring secondary containment for aboveground storage tanks. The four permits examined have slightly different wording for this condition in that the permit for UIC2D1090980 has what appears to be an earlier version.  
New permit conditions: Conditions III A.8 and A.9 found in UIC2D0392419 draft permit should appear in this permit:

Pumps and ancillary equipment (e.g. valves, flanges, filters, condensate lines and instrumentation) and handling materials that have the potential to contaminate groundwater shall be selected and installed to prevent or contain any spills or leaks.  
*and*

Sumps containing materials which have the potential to contaminate groundwater shall be designed, constructed, and operated utilizing leak detection or secondary containment, or other appropriate controls that are capable of preventing groundwater contamination.

DEP Response: The Office of Oil and Gas acknowledges your comment and the change has been incorporated into the final permit.

12. *A.11* There is a sentence in this condition which has a couple of errors. It should read:  
All valves, water drains, containment areas, and storage areas shall be locked utilizing locking devices and/or plugs.

DEP Response: The Office of Oil and Gas acknowledges your comment and the change has been incorporated into the final permit.

13. *Appendix A:* West Virginia Geological and Economic Survey's Pipeline Plus located the injection at 1568 to 1682 feet instead of the 1568 to 1674 feet that appears on the form. We are not sure where the WVGES got their information.  
Groundwater is shown in Appendix A as being at 250 and 400 feet with "salt" water at 1,100 feet.<sup>4</sup> Each aquifer will require special attention when plugging the well, especially that at 250 feet because the surface casing only extends a few feet below it.  
Appendix A's casing and tubing program has a minor error. The 1969 completion report has the surface casing at 255, not 254 feet. Without a completion report for the most recent well work it is impossible to verify the tubing depth or packer information. The top of cement at 1,090 feet approximates our own calculation.

DEP Response:

The Office of Oil and Gas (OOG) acknowledges the comment. We do not have any bearing on the information provided by the West Virginia Geological and Economic Survey and are not required to correct their database. The records reviewed by the Office of Oil and Gas supports formation depth intervals that satisfy UIC permit issuance. The changes have been incorporated into the final permit. It is important to note, that this water bearing zone is protected by cemented casing, with 1,530 feet of 7" intermediate casing cemented to surface (CTS).

The UIC plugging and abandonment is a proposal and is subject to change at the time plugging activities are conducted. The Office of Oil and Gas requires an approved plugging and abandonment permit to be issued prior to such activities, which are in accordance with the most recent requirements.

14. Groundwater Protection Plan: The operator's GPP has a number of deficiencies and we refer the Office back to our earlier permit comments for what we believe is needed in the Guidance. As for this particular GPP, the operator is unaware (in section 4) that the underground injection activity and activities on the surface are regulated for groundwater protection (e.g., 47CSR13 for injection and 47CSR58 for prevention of contamination of the surface by produced water).

The operator provides no information about local groundwater quality in section 5 in spite of the number of drinking water source tests they conducted for the permit application for this well. This groundwater information need to be summarized and a reference needs to be made to the laboratory tests in the application.

DEP Response: The Office of Oil and Gas (OOG) believes the Groundwater Protection Plan meets the minimum requirements.

15. Area of Review (AOR). It appears that all have penetrated the injection well's confining zone and injection formation. Some of these wells have been plugged in the 1990s or more recently.

When completion reports were available we were able to verify cement above the Salt Sands for 47-039-05829, 47-039-02517 and 47-039-03911. The other wells within the AOR were drilled at about the same time as these wells.

The AOR includes three plugged secondary recovery wells, 47-039-03953, 47-039-03954 and 47-039-03957.

The AOR also includes a now-plugged class IID injection well, 47-039-03911, which injected waste into the Salt Sands. This well was plugged in 2010 and like UIC2D0392419 was converted from a production well to an injection well in 1987 by setting a bridge plug above the Big Injun formation and creating perforations in the Salt Sands between 1579 and 1696 feet below the surface.

Area of Reviews are always set up as a fixed radius perimeter around the vertical well bore. This is based on an assumption that has in the past been shown to be faulty.

We believe that the volume of waste already injected by UIC2D0392419 and the existing plume of injected waste from 47-039-03911, in an area with a large number of well penetrations, raises a concern that in this instance a quarter mile AOR is not adequate.

The main issue is USDW protection, and in this case we believe scheduled groundwater monitoring is necessary for area domestic groundwater supplies

DEP Response: The Office of Oil and Gas (OOG) acknowledges the comment. The Area of review was conducted in accordance with 47CSR13-5 and supported using the EPA "Prescone" induced pressure model. The Office of Oil and Gas assumed the policy that reservoir capacity has been reached when injection fluids cannot be safely injected at or beneath their permitted maximum injection pressures.

16. Condition for Operator's Financial Responsibility for Plugging: State law (47CSR13-13.7.g) requires the permit have a condition that the operator maintain financial responsibility for plugging the well. "The permittee must show evidence of financial responsibility to the Director by submission of a surety bond, or other adequate assurance, such as a financial statement or other material acceptable to the Director."

What we are not seeing in operators' applications, except in one instance (the permit application for UIC2D0873432), is evidence of financial responsibility. Without that evidence the certification included in the permit as a condition is meaningless. Either this and

other operators need to provide documentation in their application providing evidence of financial responsibility, or the Chief needs to include in the application materials made available to the public certification that the Office has seen and reviewed evidence of financial responsibility.

Without actual evidence of financial responsibility the operator's certification that serves as a condition in the permit is meaningless.

DEP Response: The Office of Oil and Gas required EXCO Resources (PA) LLC to submit a financial responsibility for disposal well as part of 2D0392419 Class 2 UIC application packages displayed in APPENDIX I. This form satisfies the 47CSR13-13.7.g requirement that "permittee must show evidence of financial responsibility to the Director by submission of a surety bond, or other adequate assurance, such as a financial statement or other material acceptable to the Director".

#### Plugging Plan

The operator's plugging plan is a condition of the permit (47CSR13-13.7.f).

What surprises us is how so many of the plans submitted in applications that we have reviewed the past few months have been inadequately prepared.

State law in §22-6-24 and 35CSR4-13 and federal law in 40CFR146.10 have clear requirements. Federal law requires cement plugs and the intention, though not the requirement, is that the entire well bore be plugged with cement. Federal law in 40CFR146.10.a.3 requires static equilibrium with mud weight equalized top to bottom when plugging an injection well. State law has a clear methodology and clear work order requirements for a plugging permit. It stands to reason that a permit condition for a UIC Class IID well would present a carefully constructed work order satisfying 35CSR4-13.4. The plugging plan as a condition for the permit for UIC2D0392419 is grossly inadequate. There is nothing in the plan that protects the state's waters except vague verbiage. The financial responsibility for plugging should be based on a reasonable estimate for actually plugging the well. In this permit we have the operator's certification of financial responsibility and a plan that doesn't cost anything because it doesn't do anything.

We have no problem with the use of a bridge plug, but a 100 foot minimum cement plug is required above the bridge plug. The actual top of cement behind the production casing needs to be determined, the casing cut and removed near that point and another plug placed above and below the cut. There needs to be cement plug for the water at 1100 feet, again at 400 feet, and again at 250 feet at the surface casing shoe. A final 100 foot surface plug would finish the job.

Until this operator creates a valid plugging plan, gets a realistic estimate for plugging and can provide evidence of financial responsibility for that cost, the permit should not be granted.

DEP Response: The Office of Oil and Gas required EXCO Resources (PA) LLC to submit a plugging and abandonment plan for the disposal well as part of 2D0392419 Class 2 UIC application package. The UIC plugging and abandonment is a proposal and is subject to change at the time plugging activities are conducted. The Office of Oil and Gas requires an approved plugging and abandonment permit to be issued prior to such activities, which are in accordance with the most recent requirements. The operator has accepted the responsibility and all costs associated with plugging disposal well 47-039-02419 in their submittal of a completed and signed APPENDIX I – Requirement for Financial Security to Plug/Abandon an Injection Well.

**UNDERGROUND INJECTION CONTROL PERMIT**

For

**EXCO Resources (PA), LLC**

**Number UIC2D0392419**

**AUTHORIZATION TO OPERATE AN  
UNDERGROUND INJECTION CONTROL  
(UIC) INJECTION WELL  
PERMIT NUMBER # UIC 2D0392419**

In compliance with provisions of the West Virginia Code, Chapter 22, Article 6, Article 11 and Article 12, as well as Legislative Rules, Title 47, Series 13 and Series 58, Title 47, Series 55, and Title 35 Series 1 and Series 4.

NAME	EXCO Resources (PA), LLC	FACILITY TYPE	<u>Brine Disposal</u>
ADDRESS	260 Executive Drive Suite 100	WELL API #	<u>47-039-02419</u>
ADDRESS	Cranberry Township, PA 16066	FIELD NAME	NA

is authorized by this permit to inject Class II fluids that are brought to the surface in connection with conventional oil or natural gas production and may be commingled with waste waters from gas plants which are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection into the Salt Sands formations in accordance with the conditions set forth herein. The permitted injection depth shall be 1568 feet to 1674 feet. The injection well is located in Kanawha County, 7.5' Clendenin Quadrangle. The coordinates for this injection well are:

UTM NAD 83 Northing 4260720.839 and UTM NAD 83 Easting 461879.169.

The maximum permitted wellhead injection pressure is established as 440 PSI.

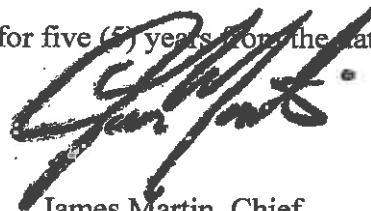
All references to West Virginia Regulations are to those that are in effect on the date that this permit becomes effective.

Any person who holds a permit shall pay an annual permit fee in accordance with the provisions of Title 47 Series 9 section 7 of the Legislative Rule. The first annual permit fee shall be remitted to the Office of Oil and Gas one (1) calendar year from the date of permit issuance; subsequent annual permit fees shall be remitted on or before the anniversary date of the permit issuance. The annual permit fee for a Class II disposal well is twenty five dollars (\$25). The permit becomes void if the annual permit fee has not been paid within one hundred eighty (180) days of the due date. The Chief shall not reissue a permit until all annual permit fees due during prior terms of that permit have been paid in full.

Failure to pay the annual groundwater fee of \$75.00 for Class IID as required by the West Virginia Code, Chapter 22 Article 11 and/or Article 12 shall be cause for revocation of this permit. The annual permit fee is due on the anniversary date of permit issuance and shall be paid on the anniversary date of issuance of this permit.

Non-compliance with the terms of this permit shall be cause for revocation of Certification under the terms of Chapter 22, Article 12, and revocation of the permit under Chapter 22, Article 11 of the West Virginia Code.

This permit and its authorization to inject shall remain in effect for five (5) years from the date of issuance of the final permit provided all terms of the permit are met.



James Martin, Chief  
Office of Oil and Gas

## **PART I**

### **A. REAPPLICATION**

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must submit an administratively complete application for a new permit at least one hundred and eighty (180) days before this permit expires and an application fee.

### **B. IMMEDIATE REPORTING**

The permittee shall report any noncompliance which may endanger human health or the environment immediately after becoming aware of the circumstances by using the WVDEP Emergency Spill line number, 1-800-642-3074. Written submission shall also be provided within five (5) days of 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, permittee shall provide the anticipated time it is expected to continue; and the steps taken or planned to be taken to reduce, eliminate, and prevent reoccurrence of the noncompliance. The following shall be included as information which must be reported immediately:

- i. Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water (USDWs).
- ii. Any non-compliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between the USDWs, or failure of mechanical integrity test demonstrations.

### **C. RIGHT OF APPEAL**

Notice is hereby given of your right to appeal the terms and conditions of this permit by which you are aggrieved to the State Environmental Quality Board by filing a NOTICE OF APPEAL on the form prescribed by such Board for this purpose, with the Board, in accordance with the provisions of Chapter 22 Article 11, Section 21 of the code of West Virginia within thirty (30) days after the date of receipt of the above permit.

### **D. EFFECT OF PERMIT**

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit based on an approved permit application. The permittee shall not allow the underground injection activity authorized by this permit to cause or allow the movement of fluid containing any contaminant into underground sources of drinking water and may not cause a violation of any primary drinking water regulation or any health-based limit promulgated under 40 CFR Chapter 1, Part 142, of the Code of Federal Regulations, or of any water quality standard promulgated by the West Virginia Department of Environmental Protection/Division of Water and Waste Management. Any underground injection activity not authorized in this permit is prohibited. Compliance with the terms of this permit does not constitute a defense to any action brought under Part C and the imminent and substantial endangerment provisions in Part D of the Safe Drinking Water Act (SDWA) or any other common or statutory law for any breach of any other applicable legal duty.

### **E. PERMIT ACTIONS**

1. This permit can be modified, revoked and reissued or terminated for cause specified in Chapter 22, Article 11 (hereafter §22-11), and Chapter 22, Article 12 (hereafter §22-12) of the West Virginia Code, and Title 47, Series 13 (hereafter 47 CSR 13) of the Legislative Rules. The filing of a request by the permittee for a permit modification, revocation and reissuance, suspension or revocation, or notification of planned changes or anticipated noncompliance, does not stay any permit condition.

2. **Transfer of Permits.** This permit is not transferable to any person unless notice is first provided to the Office of Oil and Gas and the permittee complies with requirements of 47 CSR 13-13.17. The Office of Oil and Gas may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Safe Drinking Water Act (SDWA).

#### **F. SEVERABILITY**

The provisions of this permit are severable, and if any condition of this permit or the permittee's application of any provision of this permit to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications of other provisions of the permit and the remainder of this permit shall not be affected.

#### **G. DURATION OF PERMIT**

This permit and the authorization to inject are issued for a period of five (5) years unless terminated under Part I Section H paragraph 11 of this permit. However, when through no fault of the permittee the West Virginia Department of Environmental Protection does not issue a new permit with an effective date on or before the expiration date of the previous permit and the permittee has submitted a timely administratively complete application as required in Part I section A of this permit, which is a complete application for a new permit, the expired permit shall continue to remain fully effective and enforceable.

#### **H. GENERAL REQUIREMENTS**

1. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the SDWA and the State Act and is grounds for enforcement action; for permit suspension or revocation, revocation and reissuance, or modification; or for denial of a permit renewal application. (47 CSR 13-13.12.a) Copies of UIC Program regulations (§22-11) may be obtained from the West Virginia Legislature's Web Site <http://www.legis.state.wv.us/WVCODE/Code.cfm>, and (47 CSR 13) may be obtained from the West Virginia Secretary of State's Web Site at <http://www.sos.wv.gov/>.
2. **Duty to Reapply.** If the permittee wishes to continue activity regulated by this permit after the expiration date of this permit, the permittee must apply for a new permit as required in Part I section A of this permit as well as obtain a new permit.
3. **Duty to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action 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 health of persons or 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, systems of treatment and control, and related equipment 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, adequate security at the facility to prevent unauthorized access, adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facility or similar systems only when necessary to achieve compliance with the conditions of this permit.

6. **Duty to Provide Information.** The permittee shall furnish to the Chief within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or revoking this permit, or to determine compliance with this permit. The permittee shall also furnish to the Chief, upon request, copies of records required to be kept by this permit. If the permittee becomes aware of any incomplete or incorrect information in the permit application or subsequent report(s), the permittee shall promptly submit information addressing these deficiencies to the Chief.
7. **Inspection and Entry.** The permittee shall allow the Chief, 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 must be kept under the conditions of this permit;
  - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
  - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
  - d. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance for any substances or parameters at any location.
8. **Penalties.** Any person who violates a permit requirement is subject to civil penalties, criminal penalties, fines and other enforcement actions under §22-11 and §22-12.
9. **Signatory Requirements.** Only a duly authorized person may sign documents and reports associated with this permit.
  - a. All reports required by this permit and other information requested by the Chief shall be signed as follows:
    - (1) For a corporation, by a responsible corporate officer of at least the level of vice-president;
    - (2) For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or
    - (3) For a Municipality, State, Federal, or other public agency by either a principal executive or a ranking elected official.
  - b. A duly authorized representative of the official designated in paragraph a. above may also sign only if:
    - (1) The authorization is made in writing by a person described in paragraph a. above;
    - (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, and;
    - (3) The written authorization is submitted to, and approved by, the Chief.
  - c. If an authorization under paragraph (b) of this section is no longer accurate because a different individual has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the Chief prior to or together with any reports, information or applications to be signed by an authorized representative.

- d. Any person signing a document under paragraph (b) of this section shall make the following certification: (47 CSR 13-13.11.d). "I certify under penalty of law that I have personally 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."
10. Property Rights. Issuance of this permit does not convey property rights or mineral rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, any infringement of State or local law or regulations, or any exclusive privilege.
11. Permit Actions. This permit may be modified, revoked and reissued, suspended, or revoked for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, suspension or revocation, or notification of planned changes or anticipated noncompliance, does not stay any permit condition.
12. Confidentiality of Information.
  - a. In accordance with 47 CSR 13-13.21, any information submitted to the State pursuant to this rule may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions, or in the case of other submissions, by stamping the words "CONFIDENTIAL BUSINESS INFORMATION" on each page containing such information. If no claim is made at the time of submission, the State may make the information available to the public without further notice.
  - b. Claims of confidentiality for the following information will be denied:
    - i. The name and address of any permit applicant or permittee.
    - ii. Information which deals with the existence, absence, or level of contaminants in drinking water.
13. Monitoring Reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.
14. 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 no later than thirty (30) days following each schedule date.
15. Other information. Where a permittee becomes aware that he/she failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Chief, he/she shall promptly submit such facts or information.
16. It shall be unlawful for any person, unless an authorization has been issued by a groundwater regulatory agency, to deliberately allow crude oil, or any petroleum product derived from crude oil, or seepage, or natural gas, or condensate, or salt water, or any chemical mixture which may impact groundwater quality to escape from any well, pipeline, impoundment, storage tank, treatment unit, or storage container, or be deliberately allowed to flow onto or under the land surface in such a manner that could impact groundwater quality.
17. State or Federal Laws. Nothing in this permit shall be construed to preclude the institution on any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any State or Federal law or regulation.

## **PART II**

### **A. RECORD RETENTION**

1. Required Records. The permittee shall retain all records concerning the permitted underground injection well until three (3) years after completion of any plugging and abandonment. The Director may require the owner or operator to deliver the records to the Director at the conclusion of the retention period.

### **B. MONITORING REQUIREMENTS**

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the fluid to be analyzed and the procedure for analysis of the sample shall be in accordance with test procedures approved under 40 CFR 136.3, unless otherwise approved by the Chief. The permittee shall identify the types of tests and methods used to generate the monitoring data.
2. All environmental measurements required by the permit, including but not limited to, measurements of pressure, temperature, mechanical, and chemical analyses shall be done in accordance with state guidance on quality assurance. All analysis must be performed by a West Virginia certified laboratory.
3. Records of monitoring information shall include:
  - a. The date, exact place, and time of sampling or measurements;
  - b. The individual(s) who performed the sampling or measurements;
  - c. The date(s) analysis(es) were performed;
  - d. Individual(s) who performed the analyses;
  - e. The analytical techniques or methods used; and
  - f. The results of such analyses.
4. The permittee shall daily monitor all the casing annuli with pressure sensitive devices or with such a method as approved or required by the Office of Oil and Gas to allow early detection of any leaks from the injection zone or casing. The Permittee shall also monitor injection pressure, volume, and rate daily. This information shall be reported monthly using the Office of Oil and Gas electronic WR-40 Form. Submittal shall be through the current WVDEP Electronic Submittal System (ESS).
5. The permittee shall sample and analyze injection fluids thirty (30) days prior to issuance of the UIC permit for the parameters listed in TABLE 1 below and submit the laboratory results to the Office of Oil and Gas within fifteen (15) days of receipt of the analysis.
6. The permittee shall sample, analyze and record the nature of all the injected fluid for the parameters listed in TABLE 1 below at the initiation of the injection operation and upon request by the Chief or whenever the operator observes or anticipates a change in the injection fluid.

**TABLE 1**

-pH	-Manganese
-Specific Gravity	-Total Dissolved Solids
-Barium	-Hydrogen Sulfide
-Specific Conductance	-Sodium
-Iron	-Alkalinity
-Magnesium	-Hardness
-Chloride	-Total Organic Carbon (TOC)
-Dissolved Oxygen	

7. Any analysis result of specific gravity greater than 1.2 and any analysis of TOC greater than 250.0 mg/L shall be reported to the Chief within twenty-four (24) hours of the results.
8. The permittee shall maintain a record (manifest) of every load of fluid received. The record shall include the hauler's name and signature, the operator's name and signature, API number for the well the fluid was collected or the location from where the load was obtained, the volume of the load and whether the load of fluid delivered was a split load. If the load was a split load, each operator's name and location shall be listed and, if possible, the volumes of fluid received from each operator documented. This information shall be maintained on the Class II disposal manifest attached to this permit and maintained at the facility.
9. A wellhead pressure gauge shall be installed and maintained on the injection tubing to facilitate inspection and ensure compliance of maximum injection pressures as approved on Oil and Gas Form WR-37. A daily reading of the injection pressure shall be taken and reported on Form WR-40.
10. All pipeline(s) from the injection pump to the injection well shall be tested for integrity at least once every five (5) years with the results reported and on Form WR-37 and submitted to the Office of Oil and Gas. The pipeline integrity test shall pressurize the injection pipeline(s) to 1.5 times the maximum permitted wellhead injection pressure for a minimum of thirty (30) minutes, allowing for no more than five (5) percent loss after completion. The permittee shall notify the Chief of his or her intent to conduct an integrity test of the pipeline(s) no less than twenty-four (24) hours prior to such test. Upon failure of a mechanical integrity test or expiration of the five (5) year mechanical integrity test regulatory period, the permittee shall cease operation/injection and shut-in the well immediately until successfully repaired, replaced and then tested. Repairs shall be completed by the permittee and approved by the Office of Oil and Gas. All repairs shall be completed within ninety (90) days of the failure date. If repaired, the well must be re-tested and an updated WR-37 Form must be submitted to the Office of Oil and Gas for approval. Any change made to the pipeline fittings or piping will require integrity testing.
11. The permittee shall conduct a mechanical integrity test of the injection well at a minimum frequency of once every five (5) years per 35 CSR 4-7.7.b. The permittee shall notify the Chief of his or her intent to conduct a mechanical integrity test no less than twenty-four (24) hours prior to such demonstration. The permittee must submit a WR-37 Form with each mechanical integrity test along with a copy of any test chart(s). Upon failure of a mechanical integrity test or expiration of the five (5) year mechanical integrity test regulatory period, the permittee shall cease operation/injection and shut-in the well immediately until successfully repaired, tested or permanently plugged and abandoned per regulation. Corrective action for repairs shall be completed for approval by the Office of Oil and Gas and be conducted within ninety (90) days of the failure date. If repaired, the well must be re-tested and an updated WR-37 Form must be submitted to the Office of Oil and Gas for approval.

12. In addition to the above requirement, a mechanical integrity test demonstration shall be conducted whenever protective casing or tubing is removed from the well, the packer is replaced or resealed, if well failure likely, or as requested by the Chief. The permittee may continue operation only if he or she has successfully demonstrated to the Chief the mechanical integrity of the permitted well. The permittee shall cease injection operations if a loss of mechanical integrity becomes evident or if mechanical integrity cannot be demonstrated.

**C. REPORTING AND NOTIFICATION REQUIREMENTS**

1. Anticipated Noncompliance. The permittee shall give advance notice to the Chief of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
2. Other Noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs Part I Section B, and Part II Section C Paragraph 3 of this permit, at the time monitoring reports are submitted. The report shall contain the information listed in Part I Section B of this permit. The permittee shall report all other instances of noncompliance in writing within ten (10) days of the time the permittee becomes aware of the circumstances. The reports shall contain the information listed in this permit.
3. Planned Changes. The permittee shall give notice to the Chief as soon as possible of any planned significant physical alterations, additions to the permitted facility, and/or any significant changes planned in the operation of the facility.
4. Cessation of Injection Activity. Any well which is not in use for a period of twelve (12) consecutive months shall be presumed to have been abandoned and shall promptly be plugged by the operator in accordance with the provisions in Chapter 22, Article 6 Section 24 of the West Virginia Code, unless the operator furnishes satisfactory proof to the Chief that there is a bona fide future use for such well.
5. Report on Permit Review. Within thirty (30) days of receipt of this permit, the permittee shall report to the Chief that he or she has read and understands and accepts all terms and conditions of the permit.
6. The owner or operator or person in charge of a facility subject to this rule from which a reportable discharge as described in subsection 3.3 of 35CSR1 occurs shall notify the Office of Oil and Gas by calling 1-800-642-3074 immediately; but in no case, later than twenty-four (24) hours after becoming aware of the discharge.

**PART III**

**A. OPERATING REQUIREMENTS**

1. Injection Fluid. The permittee shall not inject any hazardous substances, as defined by 40 CFR 261, or any other fluid, other than the fluids produced solely in association with oil and gas production operations.
2. Any well that penetrates the injection zone with an inactive and/or abandoned status within the permitted Area of Review, that does not have cement casing through the injection zone, shall be monitored immediately by a method approved by the Office of Oil and Gas, as well as properly plug and abandon such wells, as necessary.
3. Injection between the outermost casing protecting underground sources of drinking water and the wellbore is prohibited, as is injection into any USDW.

4. Corrective Action. The applicant must satisfy the requirement of the Office of Oil and Gas regarding any corrective action needed on all known wells penetrating the injection zone within the area of review. This must be done in a manner which satisfies the requirements of 47 CSR 13-13.9.
5. Loading and unloading stations shall have spill prevention and control facilities and procedures as well as secondary containment. Spill containment and cleanup equipment shall be readily accessible.
6. The permittee shall ensure that secondary containment for existing above ground storage tank(s) shall be adequately designed and constructed to be sufficiently impervious to prevent the released substance from penetrating the containment structure until the release can be detected and recovered, but in no case will that time be less than seventy-two (72) hours.
7. Above ground storage tank(s) associated with this underground injection facility shall have secondary containment sufficient capacity to contain 110% volume of the largest tank. For tank batteries or tanks connected in series by manifold, the combined volume of the tanks must be considered if a release from one tank or the piping is capable of emptying the other tanks.
8. Pumps and ancillary equipment (e.g. valves, flanges, filters, condensate lines and instrumentation) handling materials that have the potential to contaminate groundwater shall be selected and installed to prevent or contain any spills or leaks.
9. Sumps containing materials which have the potential to contaminate groundwater shall be designed, constructed, and operated utilizing leak detection or secondary containment, or other appropriate controls that are capable of preventing groundwater contamination.
10. No third party haulers shall be permitted without approval by the Office of Oil and Gas. For approval, the permittee shall designate by letter to the Office of Oil and Gas, any third party hauler proposed to be used for the transportation of fluids to the facility. The third party hauler may not commence transportation of fluids to the facility until approved by the Office of Oil and Gas.
11. Facility Security. The gate on the access road to the site shall be closed and locked at all times when there is not a company representative at the facility. All valves, water drains, and containment areas and storage areas shall be locked utilizing locking devices and/or plugs. During the life of this permit all gates and access points shall be secured and locked while no representative is at the facility. All visitors must check in upon arriving at the facility. Haulers (trucks) shall not be allowed to off load without the proper paperwork and documentation.

## **B. PLUGGING AND ABANDONMENT**

1. Any well which is not in use for a period of twelve (12) consecutive months shall be presumed to have been abandoned and shall promptly be plugged by the operator in accordance with the provisions of Chapter 22, Article 6, of the West Virginia Code, unless the operator furnishes satisfactory proof to the Chief that there is a bona fide future use for such well.
2. Prior to well plugging, the permittee shall apply for and receive a plugging permit from the Office of Oil and Gas to plug and abandon the well in accordance with an approved plugging and abandonment plan.
3. Plugging and abandonment shall be conducted in a manner to prevent movement of fluids into or between underground sources of drinking water.
4. Pursuant to Legislative Rule 47-13-13.7.f, the permittees plugging and abandonment plan shall be incorporated into the UIC permit. See attachment 1.

## **PART IV**

### **A. SITE SPECIFIC CONDITIONS**

1. Appendix A: Specific operational conditions.
2. Appendix H: Groundwater Protection Plan (GPP) The GPP shall be maintained and updated as necessary to protect groundwater quality.
3. Appendix I: Requirement for Financial Responsibility to plug/abandoned an injection well.
4. Attachment 1: Permittee's Plugging and Abandonment Plan.
5. Attachment 2: Site/Facility Diagram.

## APPENDIX A

1) GEOLOGIC TARGET FORMATION <u>Salt Sands</u>			
Depth	<u>1,568</u>	Feet (top)	<u>1,674</u> Feet (bottom)
2) Estimated Depth of Completed Well, (or actual depth of existing well): <u>1850</u> Feet			
3) Approximate water strata depths: Fresh <u>250, 400</u> Feet Salt <u>1,100</u> Feet			
4) Approximate coal seam depths: <u>NA</u>			
5) Is coal being mined in the area? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
6) Virgin reservoir pressure in target formation <u>NA</u> psig Source _____			
7) Estimated reservoir fracture pressure <u>NA</u> psig (BHFP)			
8) MAXIMUM INJECTION OPERATIONS:			
Injection rate (bbl/hour)	<u>15</u>		
Injection volume (bbl/day)	<u>360</u>		
Injection pressure (psig)	<u>440</u>		
Bottom hole pressure (psig)	<u>1,163</u>		
9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES			
<u>Produced brines, fracturing fluids, pit fluids, O<sub>2</sub> scavenger, bacteriacid, and scale inhibitor</u>			
Temperature of injected fluid: (°F) _____			
10) FILTERS (IF ANY) _____			
11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL _____			
<u>Corrosion inhibitor in annual fluid</u>			

## APPENDIX A (cont.)

### 12. Casing and Tubing Program

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor							
Fresh Water	8 5/8"		H-40	24	254		CTS (Surface)
Coal							
Intermediate 1							
Intermediate 2							
Production	4 1/2"		J-55	13.5	1,850 (PBTD)		TOC 1,090
Tubing	2 3/8"		J-55	4.7	1,519		
Liners							

TYPE	Wellbore Diameter	Casing Size	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)	Cement to Surface ?
Conductor							
Fresh Water							
Coal							
Intermediate 1							
Intermediate 2							
Production							
Tubing							
Liners							

### Packers

	Packer #1	Packer #2	Packer #3	Packer #4
Kind:	Haliburton R-4			
Sizes:	2 3/8" x 4 1/2"			
Depths Set:	1,519' – 1,523'			



## APPENDIX H

## GROUNDWATER PROTECTION PLAN

Facility Name: L.C. Wilson #4County: Kanawha

## Facility Location:

Postal Service Address:		
Latitude and Longitude:	38.494024; -81.437139	

## Contact Information:

Person:	Brian E. Rushe, P.E. w/ EXCO Resources (PA), LLC
Phone Number:	724-720-2590
E-mail Address:	brushe@excoresources.com

Date: 06/20/14

1. A list of all operations that may contaminate the groundwater.

Production water tanks  
Underground piping to production water injection well  
Injection well

2. A description of procedures and facilities used to protect groundwater quality from the list of potential contaminant sources above.

Secondary containment structures for tanks; tank inspection conducted in accordance with SPCC Plan  
Pipe line inspection  
Tubing, packer & multiple casing strings in place for wellbore

3. List procedures to be used when designing and adding new equipment or operations.

When adding additional tanks, secondary containment will be modified to handle additional storage capacity.

4. Summarize all activities at your facility that are already regulated for groundwater protection.

Not applicable.

5. Discuss any existing groundwater quality data for your facility or an adjacent property.

Not applicable.

6. Provide a statement that no waste material will be used for deicing or fill material on the property unless allowed by another rule.

EXCO does not utilize produced water for any kind of onsite deicing activities.

7. Describe the groundwater protection instruction and training to be provided to the employees. Job procedures shall provide direction on how to prevent groundwater contamination.

All field employees will be trained annually during one of EXCO's monthly safety meetings. This training will also coincide with EXCO's SPCC inspection training, which shall include the following:

Dike Integrity Inspection  
Piping Inspections  
Housekeeping Procedures  
Location of spill response materials and inventory

8. Include provisions for inspections of all GPP elements and equipment. Inspections must be made quarterly at a minimum.

EXCO personnel shall complete quarterly inspections at a minimum for all production tanks in accordance with the SPCC Plan; all secondary containment; all underground piping; and the Injection well head for evidence of leakage and integrity issues.

Signature:

Brian E. Ruane

Date:

10/17/14

Received  
Office of Oil & Gas

## APPENDIX I

### Requirement for Financial Responsibility to Plug/Abandon an Injection Well

To: WV Department of Environmental Protection  
Office of Oil and Gas  
601 57<sup>th</sup> Street, SE  
Charleston, West Virginia 25304-2345  
ATTN: Underground Injection Control Program

From: EXCO Resources (PA), LLC  
Brian E. Rushe, P.E.  
260 Executive Drive, Suite 100  
Cranberry Township, PA 16066

Date: June 20, 2014

Subject: Underground Injection Control (UIC) Permit Application  
# UIC2D0392419  
Requirement for Financial Responsibility

I, Brian E. Rushe, verify in accordance with 47CSR13-13.7.g., that I will maintain financial responsibility and resources to close, plug, and abandon underground injection wells(s) in a manner prescribed by the Chief of the Office of Oil and Gas.

Name: Brian E. Rushe, P.E.

Signature: Brian E. Rushe

Date: 6/20/14

# Attachment 1

**L.C. WILSON #4 – UIC 2D0392419**

## **PLUGGING & ABANDONMENT PLAN**

EXCO's plan to plug and abandon the L.C. Wilson #4 Injection Well shall consist of the following:

1. Set a cast iron bridge plug above the perforations for the injection zone.
2. Set a cement plug on top of the cast iron bridge plug.
3. Follow all West Virginia DEP Plug 7 Abandon rules and regulations from that point as to further plugs and retrieval of casing from the hole.

# Attachment 2



[illegible]

**Make as many copies of the document as necessary to comply with the UIC permit. Page numbers should be maintained sequentially to provide an adequate record.**

## **RIGHT OF APPEAL**

Notice is hereby given of your right to appeal the terms and conditions of this permit of which you are aggrieved to the Environmental Quality Board by filing a NOTICE OF APPEAL, on the form prescribed by such Board for this purpose, in accordance with the provisions of Section 21, Article 11, Chapter 22 of the Code of West Virginia within thirty (30) days after the date of receipt of this permit.

# Underground Injection Control Permit

## CERTIFICATION DOCUMENT

### West Virginia Department of Environmental Protection Office of Oil and Gas

Permit Id: 2D0392419

Permit Name: EXCO Resources (PA), LLC

In accordance with Part II, Reporting and Notification Requirements, I hereby certify that I have read and am personally familiar with all the terms and conditions of this permit.

I understand that the underground injection of any waste streams other than those provided for in this permit is strictly prohibited. I understand that failure to pay the Annual Permit Fee or any other associated fees required by West Virginia Code, Chapter 22, Articles 11 and 12 shall be cause for revocation of this Permit. I further understand that reporting is required, and noncompliance with the terms of this permit will be cause for revocation of the permit and subject me to significant penalties including the possibility of fines and imprisonment.

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Signature

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Name and Title (Type or Print)

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Date