COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In The Matter Of:

Equitrans Midstream Corporation	:	2012 Oil and Gas Act
2200 Energy Drive	:	
Canonsburg, PA 15317	:	

CONSENT ORDER AND AGREEMENT

This Consent Order and Agreement ("COA") is entered into this 29th day of October 2019, by and between the Commonwealth of Pennsylvania, Department of Environmental Protection ("Department"), and Equitrans Midstream Corporation ("Equitrans").

The Department has found and determined the following:

A. The Department is the agency with the duty and authority to implement, administer, and enforce the Oil and Gas Act, Act of February 14, 2012, P.L. 87, No. 13, 58 Pa. C.S. §§ 3201 – 3274 ("2012 Oil and Gas Act"); Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, *as amended*, 71 P.S. § 510-17 ("Administrative Code"); and the rules and regulations promulgated thereunder.

B. Equitrans, a Pennsylvania corporation, is engaged in, *inter alia,* oil and gas gathering, transportation, and storage in Pennsylvania and has a business address of 2200 Energy Drive, Canonsburg, PA 15317.

C. Equitrans is the "storage operator" as this term is defined in Section 3203 of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3203, of the Swarts Gas Storage Reservoir ("Swarts Field"), which is located in Greene County, Pennsylvania.

D. The Swarts Field is a "storage reservoir"[1] as that term is defined in Section 3203 of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3203.

E. The Swarts Field is comprised of a subsurface geologic formation into which natural gas is pumped and stored under pressure until the gas is removed.

F. The Swarts Field operates under a certificate issued by the United States Federal Energy Regulatory Commission ("FERC") on June 21, 2007. Equitrans' FERC certificate governs certain operating characteristics of the Swarts Field, including maximum inventory levels and operating pressures.

G. Various wells have been or may have been drilled into or through the storage stratum of the Swarts Field. Such wells include storage wells, observation wells, withdrawal/injection wells, production wells, plugged wells, orphan wells, and abandoned wells.

H. A "reservoir protective area"[2] is the area surrounding a storage reservoir boundary, within 2,000 feet of the reservoir boundary, that affords protection to the storage reservoir. 58 Pa. C.S. § 3203. The reservoir protective area for the Swarts Field is an area that extends 2,000 feet from the Swarts Field boundary ("Swarts Protective Area").

I. Consol Coal Resources, L.P., a Delaware limited partnership, is engaged in coal exploration and extraction activities in Pennsylvania and has a business address of 1000 Consol Energy Drive, Canonsburg, PA 15317 ("CONSOL").

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[1] Section 1 of the 2012 Oil and Gas Act defines the term "storage reservoir" to mean "that portion of a subsurface geological stratum into which gas is or may be injected for storage purposes or to test suitability of the stratum for storage." 58 Pa. C.S. § 3203.

[2] Section 1 of the 2012 Oil and Gas Act defines the term "reservoir protective area" to mean:

> The area surrounding a storage reservoir boundary, but within 2,000 linear feet of the storage reservoir boundary, unless an alternative area has been designated by the Department, which is deemed reasonably necessary to afford protection to the reservoir, under a conference held in accordance with Section 3251 (relating to conferences).

52 Pa. C S. § 3203.

J. CONSOL is the "coal operator" as that term is defined in Section 3203 of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3203, of the Harvey Mine ("Harvey Mine"). The Harvey Mine is operated by CONSOL pursuant to Coal Mining Activity Permit No. 30121301.

K. At the Harvey Mine, CONSOL extracts coal from the Pittsburgh Coal Seam. This seam overlies the entire Swarts Field.

L. The outside boundary of the Harvey Mine overlies the Swarts Field and the Swarts Protective Area; specifically, most of the Harvey Mine B District is proposed to lie above the Swarts Field.

M. Section 3234(a) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234(a), sets forth obligations on storage operators with a storage reservoir or the reservoir protective area underlying or within 2,000 linear feet of a coal mine operating in a coal seam that extends over the storage reservoir or reservoir protective area to locate and, in certain instances, plug or recondition wells, in accordance with Section 3220 of the 2012 Oil and Gas Act, that have been drilled into or through the storage stratum and located within the portion of the acreage of the operating coal mine overlying the storage reservoir or the reservoir protective area.

N. Section 3234(b) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234(b), requires storage operators operating a storage reservoir referred to in 58 Pa.C.S.A. § 3234(a) to submit a Verified Statement to the Department. That section states:

> **(b) Verified statement.** A person operating a storage reservoir referred to in subsection (a) shall file with the department and furnish a copy to the person operating the affected operating coal mine a verified statement setting forth:
>
> (1) That the map and any supplemental maps required by section 3231(a) (relating to reporting requirements for gas storage operations) have been prepared and filed in accordance with section 3231.

(2) A detailed explanation of what the storage operator has done to comply with the requirements of subsection (a)(1) and (2) and the results of those actions.
(3) Such additional efforts, if any, as the storage operator is making and intends to make to locate all wells.
(4) Any additional wells that are to be plugged or reconditioned to meet the requirements of subsection (a)(2).

(The verified statement required under this provision shall be referred to as the "Verified Statement.")

O. As of June 22, 2013, and on occasions thereafter, including in or around September of 2018, Equitrans and/or its predecessor had notice that CONSOL or its predecessor had conducted or planned to conduct active coal extraction activities in the Pittsburgh Coal Seam within 2,000 feet of the Swarts Field.

P. Pursuant to Section 3234(m)(1) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234(m)(1), a storage field operator is required to provide a Verified Statement to the Department and to the coal operator within sixty (60) days of being notified that the coal mine will be extended to within 2,000 feet of the storage reservoir.

Q. On or about November 30, 2012, Equitrans, or its predecessor, provided the Department with storage field maps, well lists, and additional information under the 2012 Oil and Gas Act. Thereafter, Equitrans, or its predecessor, provided the Department with storage field maps on or about August 27, 2014; September 24, 2014; July 30, 2015; January 11, 2017; July 12, 2017; January 18, 2018; July 18, 2018; January 4, 2019; and January 15, 2019. Additionally, Equitrans, or its predecessor, provided the Department with lists of wells on or about August 12, 2014; August 27, 2014; September 29, 2014; July 30, 2015; January 13, 2016; February 24, 2016; January 11, 2017; July 12, 2017; January 18, 2018; July 18, 2018; December 18, 2018; January 4, 2019; and January 15, 2019. At no time prior to Fall 2018 was Equitrans,

or its predecessor, notified by the Department that its submissions were deficient or that it failed to comply with the 2012 Oil and Gas Act, Subchapter C.

R. Equitrans failed to timely submit to the Department a complete Verified Statement, that complied with Section 3234(b) of the 2012 Oil and Gas Act, for the area where CONSOL's B District lies over the Swarts Field.

S. On December 26, 2018, the Department issued an Administrative Order ("Order") to Equitrans. A true and correct copy of the Order is attached as Exhibit A.

T. On January 9, 2019, Equitrans submitted information, but not all information, required under the Order to the Department.

U. Equitrans appealed the Order to the Environmental Hearing Board on January 25, 2019. The appeal is docketed at EHB Docket No. 2019-007-B.

V. By a letter dated January 9, 2019, the Department suspended Paragraph 8 of the Order until further notice.

W. Equitrans and CONSOL submitted information, jointly and separately, to the Department that was, in part, responsive to the Order, including information identifying and locating wells that have or may have been drilled into the storage stratum of the Swarts Field for an area above CONSOL's planned 5B panel and 500 feet beyond the boundaries of the 5B Panel ("5B Area"). After mining in the 5B Area, CONSOL plans on commencing mining in the 4B panel (the 4B panel and 500 feet beyond the boundaries of the 4B Panel are hereinafter the "4B Area"). An exhibit showing the location of the 5B Area and the 4B Area is attached hereto as Exhibit B. The "Swarts Remainder Area" is defined as the area of the Swarts Field and its reservoir protective area plus 500 feet laterally beyond the limits of planned coal extraction less the 5B Area and 4B Area.

X. The resources and techniques used to identify and locate wells in the 5B Area are described in Exhibit C, which was submitted to the Department by Equitrans.

Y. CONSOL is currently engaged in development mining of its planned 5B Panel above the Swarts Field pursuant to a mining plan approved by the Department's Bureau of Mine Safety.

Z. CONSOL has advised Equitrans and the Department that it does not project engaging in development mining of the 4B Area and other areas of the Harvey Mine B District outside the boundaries of the 5B Area until at least late 2019.

AA. Equitrans and/or CONSOL have not yet completed the final identification and location of wells that have been or may have been drilled into the storage stratum of the Swarts Field for areas of the Harvey Mine B District outside the boundaries of the 5B Area.

BB. Equitrans has failed to fully comply with the requirements of Sections 3233 and 3234 of the 2012 Oil and Gas Act, 58 Pa. C.S. §§ 3233 and 3234.

CC. The violations described in Paragraph BB subject Equitrans to civil penalty liability under Section 3256 of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3256.

After full and complete negotiation of all matters set forth in this Consent Order and Agreement and upon mutual exchange of covenants contained herein, the parties desiring to avoid litigation and intending to be legally bound, it is hereby ORDERED by the Department and AGREED to by Equitrans as follows:

1. Authority. This Consent Order and Agreement is an Order of the Department authorized and issued pursuant to Sections 3234(b.1), 3234(n), and 3253 of the 2012 Oil and Gas Act, 58 Pa. C.S. §§ 3234(b.1), 3234(n), and 3253, and Section 1917-A of the Administrative Code, 71 P.S. § 510-17.

2. Findings.

a. Equitrans agrees that the findings in Paragraph A through CC are true and correct, and, in any matter or proceeding involving Equitrans and the Department, Equitrans shall not challenge the accuracy or validity of these findings.

b. The parties do not authorize any other persons to use the findings in this Consent Order and Agreement in any matter or proceeding.

3. Corrective Action.

a. **5B Area; 4B Area.** On or before **October 18, 2019**, Equitrans shall submit a Verified Statement and map to the Department for the 5B Area in accordance with sections (i) – (iv) and (vi) – (vii) of the Template that is attached as Exhibit D. On or before **November 1, 2019**, Equitrans shall submit a Verified Statement and map to the Department for the 4B Area in accordance with sections (i) – (iv) and (vi) – (vii) of the Template that is attached as Exhibit D.

b. **Swarts Remainder Area.** For purposes of satisfying the requirement in 58 Pa.C.S. § 3234(a) to use every known reasonable method for discovering, locating, and establishing the plugging status for all wells that have or may have been drilled into the storage stratum in the Swarts Remainder Area, Equitrans shall, at a minimum, utilize the resources and techniques described in Exhibit C.

c. On or before **January 31, 2020**, Equitrans shall have completed the effort described in Paragraph 3b, above.

d. On or before **January 31, 2020**, Equitrans shall submit to the Department a Verified Statement containing all of the information set forth in Exhibit D and in the format

identified in Exhibit D for all wells that it has identified and located pursuant to Paragraph 3.b, above. This Verified Statement shall be verified in the manner described in Exhibit D.

e. When evaluating wells in accordance with Exhibit D, if Equitrans is unable to locate records documenting the condition of any well identified pursuant to Paragraph 3.b, above, such as well inspection reports, annual well inspections, or well integrity testing information collected under 25 Pa. Code Chapter 78, Subchapter H, Equitrans shall conduct such inspection(s) and/or testing required by the 2012 Oil and Gas Act and 25 Pa. Code Chapter 78 to establish the wells' condition and include documentation of these efforts with the Verified Statement provided pursuant to Paragraph 3.d, above.

f. On or before **January 31, 2020**, Equitrans shall submit to the Department a plan and schedule to plug or recondition (including proposals for plugging or reconditioning through an approved alternative method) any wells requiring plugging or reconditioning identified in the Verified Statement, submitted pursuant to Paragraph 3.d, above, in accordance with the 2012 Oil and Gas Act and 25 Pa. Code Chapter 78. The schedule, as may be modified by the Department, shall be incorporated by reference as a requirement of this COA.

g. On or before **October 18, 2019**, Equitrans shall submit stable carbon and hydrogen isotopic analyses for representative gas from the Swarts Field. Equitrans shall submit additional carbon and hydrogen isotopic analyses for representative gas from the Swarts Field to the Department on November 1st of each year.

h. On or before **October 18, 2019**, Equitrans shall revise its Storage Integrity Plan to address potential impacts from underground coal mining activities above the Swarts Field and Hunter's Cave Field.

4. This COA replaces the Order, and supersedes the Order and all of its requirements.

5. Within five days of the date of this COA, Equitrans shall file with the Environmental Hearing Board all documents required to withdraw its appeal at EHB Dkt. No. 2019-007-B with prejudice.

6. Civil Penalty Settlement. Equitrans consents to the assessment of a civil penalty of $ 650,000, which shall be paid in full within ten (10) days of signing. This payment is in settlement of the Department's claim for civil penalties against Equitrans for the violations set forth in Paragraph BB, above, covering the period from November 1, 2018 to January 31, 2019. The payment shall be by corporate check or the like made payable to "Commonwealth of Pennsylvania" and sent to the address set forth in Paragraph 13 (Correspondence with the Department), below.

7. Stipulated Civil Penalties.

a. In the event Equitrans fails to comply in a timely manner with the requirements of Paragraphs 3.a, 3.g, 3.h, or Paragraph 5 of this Consent Order and Agreement when and by the dates required herein, respectively, Equitrans shall be in violation of this Consent Order and Agreement and, in addition to other applicable remedies, shall pay a civil penalty in the amount of $500 per day for each violation.

b. In the event Equitrans fails to comply in a timely manner with the requirements of Paragraphs 3.b and 3.c, of this Consent Order and Agreement, when and by the dates required herein, respectively, Equitrans shall be in violation of this Consent Order and Agreement and, in addition to other applicable remedies, shall pay a civil penalty in the amount of $2,000 per day for each violation.

c. In the event Equitrans fails to comply in a timely manner with the requirements of Paragraphs 3.d, 3.e, or 3.f of this Consent Order and Agreement, when and by the dates required herein, respectively, Equitrans shall be in violation of this Consent Order and Agreement and, in addition to other applicable remedies, shall pay a civil penalty in the amount of $2,500 per day for each violation.

d. Stipulated civil penalty payments shall be payable monthly on or before the fifteenth day of each succeeding month and shall be forwarded as described in Paragraph 6 (Civil Penalties), above.

e. Any payment under this paragraph shall neither waive Equitrans' duty to meet its obligations under this Consent Order and Agreement nor preclude the Department from commencing an action to compel Equitrans' compliance with the terms and conditions of this Consent Order and Agreement. The payment resolves only Equitrans' liability for civil penalties arising from the violations of this Consent Order and Agreement for which the payment is made.

f. Stipulated civil penalties shall be due automatically and without notice.

8. Additional Remedies.

a. In the event Equitrans fails to comply with any provision of this Consent Order and Agreement, the Department may, in addition to the remedies prescribed herein, pursue any remedy available for a violation of an order of the Department, including an action to enforce this Consent Order and Agreement.

b. The remedies provided by this paragraph and Paragraph 7 (Stipulated Civil Penalties) are cumulative, and the exercise of one does not preclude the exercise of any other. The failure of the Department to pursue any remedy shall not be deemed to be a waiver of

that remedy. The payment of a stipulated civil penalty, however, shall preclude any further assessment of civil penalties for the violation for which the stipulated penalty is paid.

9. Reservation of Rights. The Department reserves the right to require additional measures to achieve compliance with applicable law. Equitrans reserves the right to challenge any action which the Department may take to require those measures.

10. Liability of Operator. Equitrans shall be liable for any violations of the Consent Order and Agreement, including those caused by, contributed to, or allowed by its officers, agents, employees, or contractors. Equitrans also shall be liable for any violation of this Consent Order and Agreement caused by, contributed to, or allowed by its successors and assigns.

11. Transfer of Site.

a. The duties and obligations under this Consent Order and Agreement shall not be modified, diminished, terminated, or otherwise altered by the transfer of any legal or equitable interest in the Swarts Field or any part thereof.

b. If Equitrans intends to transfer any legal or equitable interest in the Swarts Field which is affected by this Consent Order and Agreement, Equitrans shall serve a copy of this Consent Order and Agreement upon the prospective transferee of the legal and equitable interest at least thirty (30) days prior to the contemplated transfer.

12. Correspondence with Department. All correspondence with the Department concerning this Consent Order and Agreement shall be addressed to:

David McDermott or successor
Environmental Group Manager
Southwest District Office
Oil & Gas Operations
400 Waterfront Drive
Pittsburgh, PA 15222-4745
Phone and Facsimile:
412-442-4000

412-442-4238

13. Correspondence with Equitrans. All correspondence with Equitrans concerning this Consent Order and Agreement shall be addressed to:

Todd L. Normane
Deputy General Counsel – Environmental & Regulatory Affairs
Equitrans Midstream Corporation
2200 Energy Drive
Canonsburg, PA 15317
Direct: (412) 553-5931
Cell: (412) 316-6632
tnormane@equitransmidstream.com

and

Hannah McCoy
Environmental Director
Equitrans Midstream Corporation
2200 Energy Drive
Canonsburg, PA 15317
E-MAIL:
PHONE

Equitrans shall notify the Department whenever there is a change in the contact person's name, title, or address. Service of any notice or any legal process for any purpose under this Consent Order and Agreement, including its enforcement, may be made by mailing a copy by first class mail to the above address.

14. Force Majeure.

a. In the event that Equitrans is prevented from complying in a timely manner with any time limit imposed in this Consent Order and Agreement solely because of a strike, fire, flood, act of God, or other circumstance beyond Equitrans' control and which Equitrans, by the exercise of all reasonable diligence, is unable to prevent, then Equitrans may petition the Department for an extension of time. An increase in the cost of performing the

obligations set forth in this Consent Order and Agreement shall not constitute circumstances beyond Equitrans' control. Equitrans' economic inability to comply with any of the obligations of this Consent Order and Agreement shall not be grounds for any extension of time.

b. Equitrans shall only be entitled to the benefits of this paragraph if it notifies the Department within five (5) working days by telephone and within ten (10) working days in writing of the date it becomes aware or reasonably should have become aware of the event impeding performance. The written submission shall include all necessary documentation, as well as a notarized affidavit from an authorized individual specifying the reasons for the delay, the expected duration of the delay, and the efforts which have been made and are being made by Equitrans to mitigate the effects of the event and to minimize the length of the delay. The initial written submission may be supplemented within ten working days of its submission. Equitrans' failure to comply with the requirements of this paragraph specifically and in a timely fashion shall render this paragraph null and of no effect as to the particular incident involved.

c. The Department will decide whether to grant all or part of the extension requested on the basis of all documentation submitted by Equitrans and other information available to the Department. In any subsequent litigation, Equitrans shall have the burden of proving that the Department's refusal to grant the requested extension was an abuse of discretion based upon the information then available to it.

15. Severability. The paragraphs of this Consent Order and Agreement shall be severable, and, should any part hereof be declared invalid or unenforceable, the remainder shall continue in full force and effect between the parties.

16. Entire Agreement. This Consent Order and Agreement shall constitute the entire integrated agreement of the parties. No prior or contemporaneous communications or prior

drafts shall be relevant or admissible for purposes of determining the meaning or extent of any provisions herein in any litigation or any other proceeding.

17. Attorney Fees. The parties shall bear their respective attorney fees, expenses and other costs in the prosecution or defense of this matter or any related matters, arising prior to execution of this Consent Order and Agreement.

18. Modifications. No changes, additions, modifications, or amendments of this Consent Order and Agreement shall be effective unless they are set out in writing and signed by the parties hereto.

19. Titles. A title used at the beginning of any paragraph of this Consent Order and Agreement may be used to aid in the construction of that paragraph, but shall not be treated as controlling

20. Decisions Under Consent Order. Any decision which the Department makes under the provisions of this Consent Order and Agreement, including a notice that stipulated civil penalties are due, is intended to be neither a final action under 25 Pa. Code § 1021.2, nor an adjudication under 2 Pa. C.S. § 101. Any objection which Equitrans may have to the decision will be preserved until the Department enforces this Consent Order and Agreement.

21. Dispute Resolution.

a. Equitrans may initiate dispute resolution under this paragraph in response to any decision required of the Department under Paragraph 3, above.

b. To initiate dispute resolution, Equitrans shall provide written notice to the Department within ten (10) days of the decision in dispute. Equitrans shall have an additional ten (10) days to provide the Department with a written list of objections to the decision in

dispute, the relevant facts, analysis and opinions, and other supporting data ("Statement of Position"). The Department shall have twenty (20) days to provide its Statement of Position.

c. Within the twenty (20) day period following receipt of the Department's Statement of Position, the Southwest District Oil & Gas Operations Program Manager and Equitrans' - Environmental Director shall confer in an attempt to resolve the dispute. In the event the parties are unable to resolve the dispute within this period, the Statements of Position shall be provided to the Department's Director, Bureau of Oil & Gas Operations, to issue a final decision resolving the dispute.

d. During the pendency of the dispute resolution procedures set forth in Subparagraphs (b) and (c), any obligation to be performed under this Consent Order and Agreement which is the subject of such dispute, and any associated activities whose performance is directly dependent upon the resolution of the dispute, shall be postponed for a period of time not to exceed the actual time taken to resolve the dispute pursuant to Subparagraphs (b) and (c) or as otherwise agreed by the parties. All other obligations and activities shall be completed in accordance with the terms of this Consent Order and Agreement.

e. Any time period for dispute resolution set forth herein may be extended by written agreement of the parties.

f. For decisions which are specified as appealable to the Environmental Hearing Board under Paragraph 19 (Decisions Under Consent Order), Equitrans must either appeal the decision to the Board within thirty (30) days of its receipt, or initiate dispute resolution in the manner set forth in this paragraph and, in all events, before the expiration of the 30 day appeal period. If dispute resolution is initiated before the expiration of the appeal period,

the initial decision shall be suspended until the Department makes a final decision under Subparagraph (c).

22. Termination of Consent Order and Agreement. Equitrans' obligations, but not the Findings, of this COA shall terminate when the Department has confirmed in writing that Equitrans has: 1) completed all of the requirements of this COA; and 2) paid any outstanding stipulated civil penalties due under Paragraph 7 (Stipulated Civil Penalties), above.

23. Execution of Agreement. This Consent Order and Agreement may be signed in counterparts, each of which shall be deemed to be an original and all of which together shall constitute one and the same instrument. The counterparts may be transmitted by facsimile or electronically using portable document format (.pdf), each of which shall be deemed to be an original and all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have caused this Consent Order and Agreement to be executed by their duly authorized representatives. The undersigned representatives of Equitrans certify under penalty of law, as provided by 18 Pa. C.S. § 4904, that they are authorized to execute this Consent Order and Agreement on behalf of Equitrans; that Equitrans consents to the entry of this Consent Order and Agreement as a final ORDER of the Department; and that Equitrans hereby knowingly waives its right to appeal this Consent Order and Agreement and to challenge its content or validity, which rights may be available under Section 4 of the Environmental Hearing Board Act, Act of July 13, 1988, P.L. 530, 35 P.S. § 7514; the Administrative Agency Law, 2 Pa. C.S. § 103(a) and Chapters 5A and 7A; or any other provisions of law. (Signature by Equitrans' attorney certifies only that the agreement has been signed after consulting with counsel.)

FOR EQUITRANS MIDSTREAM CORPORATION:

Name: Diana Charletta
Title: President

TLN 10/24/14

FOR THE COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION:

For

Daniel F. Counahan
Program Manager
Southwest District Oil & Gas Operations

Name: Tobin M. Nelson
Title: Corporate Secretary

Name: Todd L. Normane
Title: Deputy General Counsel

Michael J. Heilman
Assistant Regional Counsel

Exhibit A

Administrative Order dated December 26, 2018

(attached)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In The Matter Of:

Equitrans Midstream Corporation	:	2012 Oil and Gas Act
2200 Energy Drive	:	
Canonsburg, PA 15317	:	

ORDER

NOW, this 26th day of December 2018, the Commonwealth of Pennsylvania, Department of Environmental Protection ("Department") has found and determined the following:

The Parties and Site

A. The Department is the agency with the duty and authority to implement, administer, and enforce the Oil and Gas Act, Act of February 14, 2012, P.L. 87, No. 13, 58 Pa. C.S. §§ 3201 – 3274 ("2012 Oil and Gas Act"); Section 1917-A of the Administrative Code of 1929, Act of April 9, 1929, P.L. 177, *as amended*, 71 P.S. § 510-17 ("Administrative Code"); and the rules and regulations promulgated thereunder.

B. Equitrans Midstream Corporation, a Pennsylvania corporation, is engaged in, *inter alia,* oil and gas gathering, transportation and storage in Pennsylvania and has a business address of 2200 Energy Drive, Canonsburg, PA 15317 ("Equitrans").

C. Equitrans is the "storage operator" as this term is defined in Section 3203 of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3203, of the Swarts Gas Storage Reservoir ("Swarts Field"), located in Greene County, Pennsylvania.

D. The Swarts Field is a "storage reservoir" as that term is defined in Section 3203 of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3203.

E. A storage reservoir is an area in a geologic formation into which natural gas is pumped and stored under pressure until the gas is removed.

F. Various wells have been or may have been drilled into or through the storage stratum of the Swarts Field (collectively "Wells"). Such wells include storage wells, observation wells, withdrawal/injection wells, production wells, and abandoned wells.

G. A "reservoir protective area" is the area surrounding a storage reservoir boundary that protects the storage reservoir. Section 3203 of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3203. The reservoir protective area for the Swarts Field is an area that extends 2,000 feet from the Swarts Field boundary ("Swarts Protective Area").

H. Consol Coal Resources, L.P., a Delaware limited partnership, is engaged in coal exploration and extraction activities in Pennsylvania and has a business address of 1000 Consol Energy Drive, Canonsburg, PA 15317 ("CCR").

I. CCR is the "coal operator" as that term is defined in Section 3203 of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3203, of the Harvey Mine ("Harvey Mine"). The Harvey Mine is operated by CCR pursuant to Coal Mining Activity Permit No. 30121301.

J. The Harvey Mine extracts coal from the Pittsburgh Coal Seam, which overlies the entire Swarts Field.

K. The outside boundary of the Harvey Mine overlies the Swarts Field and the Swarts Protective Area.

Duties of Storage Operators to Take Actions to Safeguard Mine Workers

L. If CCR's coal mining activities in the strata above the Swarts Field were to encounter and damage a Well that had not previously been discovered and properly plugged or reconditioned ("Uncharted Wells"), the damaged Well could allow gas from the Swarts Field to

flood the mine, posing an extreme danger of asphyxiation or fire/explosion in the mine. To protect human life, it is therefore necessary for storage operators such as Equitrans to take measures necessary to prevent the escape of gas out of the storage field and its facilities.

M. On several occasions, CCR's coal mining operations in the Harvey Mine or nearby coal mines have encountered abandoned wells, the existence and location of which were previously unknown to CCR and undeclared by any other person to CCR.

N. Section 3234(a) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234(a), sets forth obligations on storage operators to locate and properly safeguard wells drilled into or through the storage stratum or a storage reservoir in advance of mining activities. That section states in relevant part:

> **§ 3234. Gas storage reservoir operations in coal areas.**
>
> **(a) General rule.** A person operating a storage reservoir which underlies or is within 2,000 linear feet of a coal mine operating in a coal seam that extends over the storage reservoir or the reservoir protective area shall:
>
> (1) Use every known reasonable method for discovering and locating all wells which have or may have been drilled into or through the storage stratum in the acreage lying within the outside coal boundaries of the operating coal mine overlying the storage reservoir or the reservoir protective area.
>
> (2) Plug or recondition, as provided by section 3220 (relating to plugging requirements) and subsection (e), all known wells, except to the extent provided in subsections (e), (f), (g) and (h), drilled into or through the storage stratum and located within the portion of the acreage of the operating coal mine overlying the storage reservoir or the reservoir protective area. If an objection is raised as to use of a well as a storage well and, after a conference under section 3251 (relating to conferences), it is determined by the department, taking into account all circumstances and conditions, that the well should not be used as a storage well, the well shall be plugged unless, in the opinion of the storage operator, the well may be used as a storage well in the future, in which case, upon approval of the department after taking into account all circumstances and conditions, the storage operator may recondition and inactivate the well rather than plug it.
>
> (3) The requirements of paragraph (2) shall be deemed to have been fully complied with if, as the operating coal mine is extended, all wells which from time to time come within the acreage described in paragraph (2) are

reconditioned or plugged as provided in section 3220 and subsection (e) or (f) so that, by the time the coal mine has reached a point within 2,000 linear feet of the wells, they will have been reconditioned or plugged in accordance with section 3220 and subsection (e) or (f).

O. Section 3234(b) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234(b), requires storage operators to verify to the Department the steps taken to find and safeguard Wells drilled into or through the storage stratum or a storage reservoir in advance of coal mining activities. That section states:

> **(b) Verified statement.** A person operating a storage reservoir referred to in subsection (a) shall file with the department and furnish a copy to the person operating the affected operating coal mine a verified statement setting forth:
>
> (1) That the map and any supplemental maps required by section 3231(a) (relating to reporting requirements for gas storage operations) have been prepared and filed in accordance with section 3231.
>
> (2) A detailed explanation of what the storage operator has done to comply with the requirements of subsection (a)(1) and (2) and the results of those actions.
>
> (3) Such additional efforts, if any, as the storage operator is making and intends to make to locate all wells.
>
> (4) Any additional wells that are to be plugged or reconditioned to meet the requirements of subsection (a)(2).
>
> (The verified statement required under this provision shall be referred to as "Verified Statement")

P. Section 3234(o) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234(o), imposes a duty on storage operators to keep and operate all wells that penetrate the storage field in a manner designed to prevent the escape of gas from the storage field. That section states:

> **(o) Prevention of escape of gas.**--In addition to initial compliance with other provisions of this chapter and lawful orders issued under this chapter, it shall be the duty, at all times, of a person owning or operating a storage reservoir subject to this chapter to keep all wells drilled into or through the storage stratum in a condition, and operate the wells in a manner, which is designed to prevent the escape of gas out of the storage reservoir and its facilities, and to operate and maintain the storage reservoir and its facilities in the manner prescribed by regulation of the department and at a pressure that will prevent gas from escaping

> from the reservoir or its facilities. This duty shall not be construed to include inability to prevent the escape of gas when escape results from an act of God or a person not under the control of the storage operator, except that this exception does not apply to a well which the storage operator has failed to locate and make known to the department. If an escape of gas results from an act of God or a person not under the control of the storage operator, the storage operator shall be under the duty to take any action reasonably necessary to prevent the further escape of gas out of the storage reservoir and its facilities.

Equitrans' Violation of Storage Operator's Duties

Q. CCR and its predecessor have provided maps showing completed and projected coal mining excavations and workings for the Harvey Mine to Equitrans and/or its predecessor and to the Department every six months as required by Section 3232(b) of the 2012 Oil & Gas Act, 58 Pa. C.S. § 3232(b).

R. On or about June 22, 2013, Equitrans and/or its predecessor had notice that CCR or its predecessor had conducted active coal extraction activities in the Pittsburgh Coal Seam within 2,000 feet of the Swarts Field.

S. Equitrans and/or its predecessor have had notice that on numerous occasions since June 22, 2013, CCR or its predecessor conducted further active coal extraction activities in the Pittsburgh Coal Seam within 2,000 feet of the Swarts Field.

T. A storage field operator shall provide a Verified Statement within sixty (60) days of being notified that in the next nine months or less time the coal mine will be extended to within 2,000 feet of the storage reservoir. Section 3234(m) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234(m).

U. On or about June 22, 2013, Equitrans and/or its predecessor had notice that CCR or its predecessor's coal mining operations in the Pittsburgh Coal Seam would, in the next nine months or less time, be extended to within 2,000 feet of the Swarts Field.

V. As the date of this Order, Equitrans is in violation of Section 3234(a) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234 (a). Specifically, Equitrans has failed to:

1. "Use every known reasonable method for discovering and locating all wells which have or may have been drilled into or through the storage stratum in the acreage lying within the outside coal boundaries" of the Harvey Mine overlying the Swartz Field and Swartz Protective Area; and

2. Adequately plug or recondition all known Wells drilled into or through the storage stratum and located within the portion of the acreage of the Harvey Mine overlying the Swartz Field and Swartz Protective Area.

W. As the date of this Order, Equitrans is in violation of Section 3234(b) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234 (b). Specifically, Equitrans has failed to submit a Verified Statement, as that term is identified in Paragraph O, above, in accordance with this regulation, for the Swartz Field.

X. The violations described in Paragraphs V and W, above, constitute unlawful conduct under Section 3259 of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3259.

Y. According to CCR, the current extent of its active coal extraction activities in the Pittsburgh Coal Seam into the Swarts Field Protective Area is depicted on Exhibit A.

ORDER

NOW, THEREFORE, pursuant to Sections 3234(b.1), 3234(n) and 3253 of the 2012 Oil and Gas Act, 58 Pa. C.S. §§ 3234(b.1), 3234(n), 3253 and Section 1917-A of the Administrative Code, 71 P.S. § 510-17, the Department hereby ORDERS that:

1. ***Verified Statement.*** On or before January 9, 2019 at 4:00 p.m. Eastern Standard Time (EST), Equitrans shall submit to the Department a Verified Statement that fully meets all

requirements of Section 3234(b) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234(b), for the Swarts Field.

2. The Verified Statement, required pursuant to Paragraph 1, shall, at a minimum, include the following information:

a. Identification of all methods used, to date, to discover and locate all Wells which have or may have been drilled into or through the storage stratum in the Swarts Field and the Swarts Protective Area;

b. Identification of all Wells that have been discovered and located, which have or may have been drilled into or through the storage stratum in the Swarts Field and the Swartz Protective Area;

c. Identification of any additional methods Equitrans plans to use to discover and locate all Wells which have or may have been drilled into or through the storage stratum in the Swarts Field and the Swarts Protective Area;

d. Identification of all Wells that have been discovered and located in the Swarts Field and the Swarts Protective Area that have been plugged or reconditioned, and the date each Well was plugged or reconditioned;

e. Identification of all Wells that have been discovered and located in the Swarts Field and the Swarts Protective Area that will be adequately plugged or reconditioned, including a schedule for adequately plugging or reconditioning each such Well;

f. A schedule for discovering and locating all Wells which have or may have been drilled into or through the storage stratum in the Swarts Field and the Swarts Protective Area, and have not yet been discovered and located, and a schedule for adequately plugging or reconditioning the Wells identified and located;

g. Identify all possible additional methods for discovering and locating wells which have or may have been drilled into or through the storage stratum in the Swarts Field and the Swarts Protective Area that Equitrans has chosen to not use, and set forth the technical bases and any other reasons for not using these methods;

h. If Equitrans has been informed of the existence and location of any Wells by another party ("Third Party Well"), Equitrans shall identify the party who identified each Third Party Well, and Equitrans shall provide any information to which it has access that is responsive to subsections a-g, above, for each Third Party Well; and

i. Equitrans shall show that any maps or data provided with the Verified Statement, or that the Verified Statement relies upon, are accurate, including but not limited to the location of storage reservoir boundaries and Well locations.

3. ***Digital Files***. On or before January 9, 2019 at 4:00 p.m. EST, Equitrans shall submit to the Department digital files that can be mapped using Geographic Information System (GIS) technology for all Wells that Equitrans has identified and located in the Swarts Field and the Swarts Protective Area.

a. Information relating to the Wells must include the status (plugged, active, unknown, planned for plugging, etc.); type (storage, observation, etc.); whether the Well has been field-located; source(s) of information for each Well; and supporting documentation for each Well (well record, plugging certificate, well bore schematics etc.). For all field-located Wells, Equitrans shall also provide the distance discrepancy between the original mapped location of the Well and the field coordinates.

b. Equitrans shall supplement its response as it discovers and locates additional Wells, which have or may have been drilled into or through the storage stratum in the

Swarts Field and provide digital files that can be mapped using GIS technology for the additional Wells and the information described in subsection 3.a. for the additional wells.

4. ***Plugged or Reconditioned Wells.***

a. On or before January 9, 2019 at 4:00 p.m. EST, Equitrans shall provide evidence that all Wells which have or may have been drilled into or through the storage stratum in the Swarts Field and the Swarts Protective Area that it has identified and located, and which are located within 2,000 feet of CCR's Harvey Mine coal extraction as depicted on Exhibit A, have been adequately plugged or reconditioned. The evidence shall include, but is not limited to, schematics for each plugged Well.

b. If any Wells which have or may have been drilled into or through the storage stratum in the Swarts Field and the Swarts Protective Area that Equitrans has identified and located, which are located within 2,000 feet of CCR's coal extraction as depicted on Exhibit A, have not been adequately plugged or reconditioned, Equitrans shall provide a schedule for adequately plugging or reconditioning of these wells.

c. If Equitrans asserts that any Well was plugged prior to April 18, 1985, Equitrans shall provide evidence showing that the plugging was done in the manner required by 58 Pa. C.S. § 3220, or in a manner approved as an alternative method in accordance with 58 Pa. C.S. § 3221 (relating to alternative methods), and that the plugging is still sufficiently effective to, at a minimum, meet the requirements of 58 Pa. C.S. Subchapter C.

5. ***Plan for Prevention of Escape of Gas.*** On or before January 9, 2019 at 4:00 p.m. EST, Equitrans shall provide a plan ("Plan") that sets forth how it will "prevent the escape of gas out of the [Swarts Field] and its facilities" as required by Section 3234(o) of the 2012 Oil and Gas Act, 58 Pa. C.S. § 3234(o). The Plan shall detail the method(s) to be used and the basis for

Equitrans' belief that such methods will be successful, and shall include a schedule for implementation. Upon approval by the Department, Equitrans shall fully implement the Plan pursuant to this schedule.

6. ***Records.*** Within ten (10) calendar days from receipt of this Order, Equitrans shall submit to the Department electronic copies (in portable document format (.pdf)) of the following:

a. ***Inspection Reports***. Reports of monthly inspections performed pursuant to 25 Pa. Code § 78.402(a) and (b) for storage wells and observation wells at the Swarts Field and the Swarts Protective Area covering the past twelve (12) months;

b. ***Annual Inspections.*** Reports of annual inspections of the Swarts Field and the Swarts Protective Area performed pursuant to 25 Pa. Code § 78.402(c) for the past five (5) years; and

c. ***Gas Storage Well Integrity Testing***. Pursuant to 25 Pa. Code § 78.403(b), Gas Storage Well Integrity Monitoring Reports for Swarts Field Wells performed pursuant to 25 Pa. Code § 78.403 for the past five (5) years.

7. ***Storage Field Gas Characterization Samples.***

a. Within ten (10) calendar days of the date of this Order, Equitrans shall provide gas chromatograph compositional data for gas stored in the Swarts Field from a representative number of locations in order to characterize the composition of storage field gas.

b. Within forty-five (45) calendar days from receipt of this Order, Equitrans shall provide storage field gas characterization sample analysis results for the locations sampled and analyzed pursuant to subsection 7.a. The results shall include the stable isotopic composition of the gas and component composition of the gas, *e.g.*, methane, ethane, propane, butane. The location and date of sample collection shall also be provided.

8. ***Depressurization of Swartz Field.*** If the Department determines that Equitrans did not comply with Paragraph 1, above, by filing a Verified Statement for the Swarts Field and conducting activities that fully meet the requirements of 58 Pa. C.S. § 3234(a) and (b) on or before January 9, 2019 at 4:00 p.m. EST, or if the Department determines that Equitrans did not comply with Paragraph 6, above, by providing to the Department a complete and adequate plan that sets forth how it will "prevent the escape of gas out of the [Swarts Field] and its facilities" on or before January 9, 2019 at 4:00 p.m. EST, Equitrans shall do the following:

a. On or before January 9, 2019 at 4:01 p.m. EST, Equitrans shall: (i) suspend the injection of gas into the Swarts Field; and (ii) shall remove gas from the Swarts Field to reach and maintain the lowest possible surface-measured pressure while operating in accordance with recognized engineering and operational procedures. Equitrans may petition the Department, in writing, to reduce the Swartz Field pressure to a different pressure than the lowest possible surface-measured pressure. In its petition, Equitrans would have the burden of showing that reaching and maintaining the lowest possible surface-measured pressure is infeasible, presents an undue hardship, or endangers health and safety. The petition should include technical justification and documentation for its assertions and for any alternative low pressure it proposes.

b. Equitrans shall provide any monitored pressure data for the Swarts Field, including pressure data from continuous monitors, obtained from its monitoring wells and the calculated storage reservoir pressure to the Department on a weekly basis.

c. Within five (5) days of reaching the lowest possible surface-measured pressure, Equitrans shall submit to the Department calculations of the rate of gas flow (cubic

feet/second) that would emanate from a well with mechanical integrity that intercepts the Swarts Field and is open to the atmosphere.

d. Equitrans shall continue using its equipment and infrastructure to maintain the lowest operating reservoir pressure at the Swarts Field (or such other pressure if approved by the Department pursuant to Paragraph 8.a) until the Department determines, in writing, that Equitrans has fully complied with Paragraphs 1 and 5 of this Order.

e. Equitrans shall submit, upon and within the time period requested by the Department, any additional and relevant information in Equitrans' possession that the Department determines is necessary to evaluate the safety threats to the Harvey Mine and persons working in it or the public, which may exist due to Uncharted Wells.

f. Equitrans shall achieve the lowest possible surface-measured pressure at the Swarts Field while operating in accordance with recognized engineering and operational procedures on or before February 1, 2019 at 8:00 a.m. EST. However, Equitrans may petition the Department for a different time period. In support of such a petition, Equitrans would have the burden of demonstrating that it is technically or operationally infeasible to reach the lowest possible surface-measured pressure at the Swarts Field while operating in accordance with recognized engineering and operational procedures on or before February 1, 2019 at 8:00 a.m. EST, and justify a different time period when such a pressure reduction could be achieved.

9. ***Correspondence.*** All correspondence with and submissions to the Department concerning this Order shall be addressed as follows:

Attention: David McDermott
Oil and Gas Operations
Pennsylvania Department of Environmental Protection
400 Waterfront Drive
Pittsburgh, PA 15222-4745

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board) pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa. C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board
Rachel Carson State Office Building, Second Floor
400 Market Street
P.O. Box 8457
Harrisburg, PA 17105-8457

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TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800-654-5984.

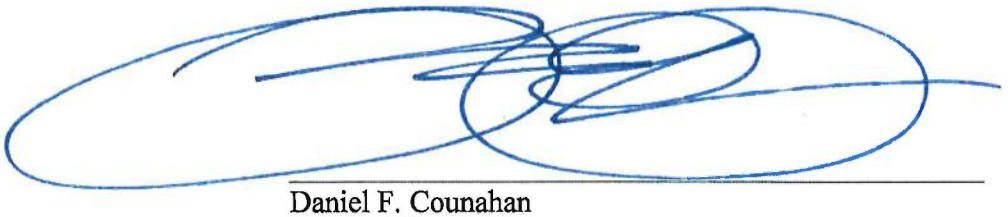
Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at http://ehb.courtapps.com or by contacting the Secretary to the Board at 717-787-3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717-787-3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

FOR THE COMMONWEALTH OF PENNSYLVANIA,
DEPARTMENT OF ENVIRONMENTAL PROTECTION:



Daniel F. Counahan
District Manager
Southwest District Oil and Gas Operations

EXHIBIT A

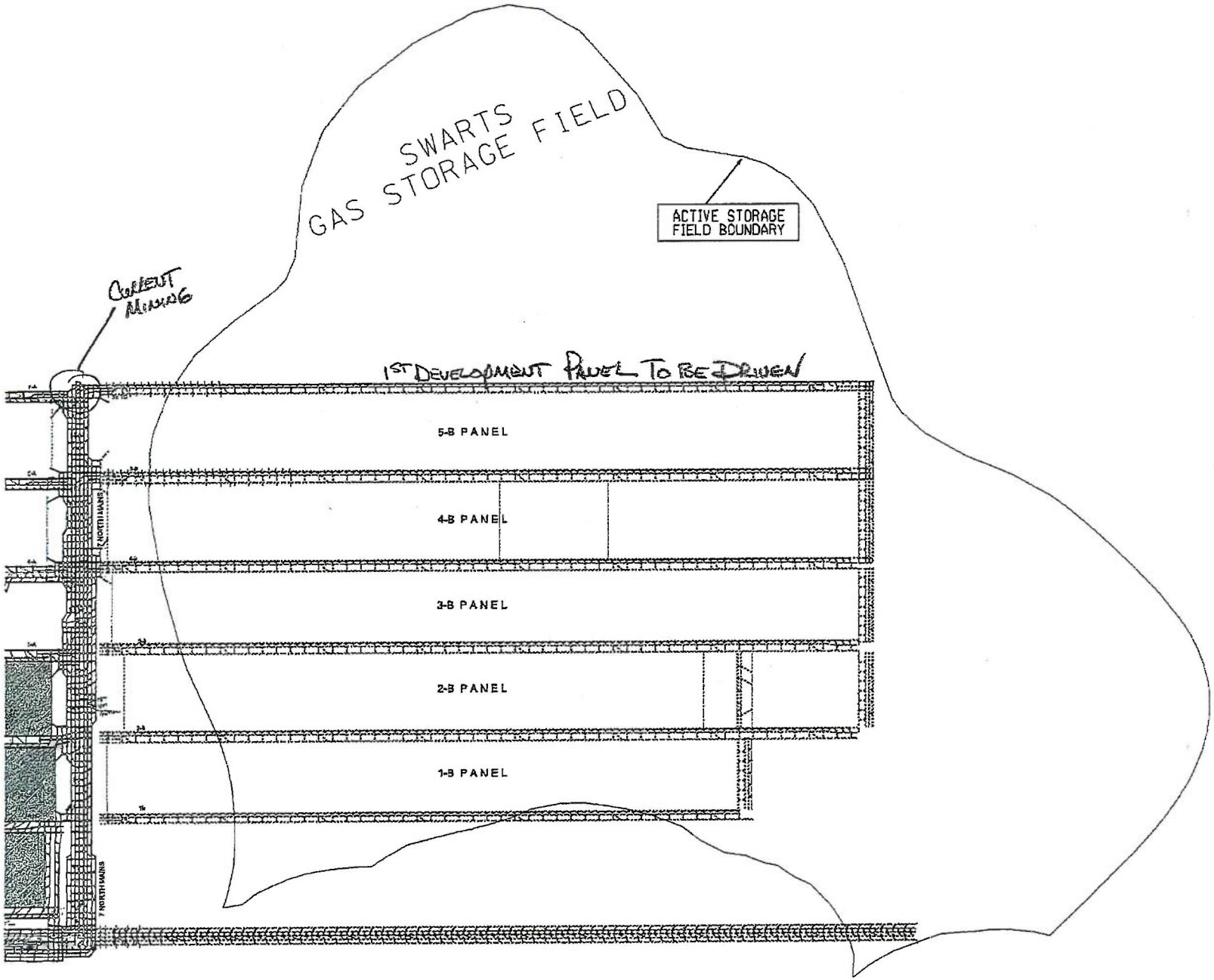

SWARTS
GAS STORAGE FIELD
ACTIVE STORAGE
FIELD BOUNDARY
CURRENT
MINING
1ST DEVELOPMENT PANEL TO BE DRIVEN
5-B PANEL
4-B PANEL
3-B PANEL
2-B PANEL
1-B PANEL
7 NORTH MAINS
7 NORTH MAINS

Exhibit B

Map of 5B Area and 4B Area

(attached)

EXHIBIT C – RESOURCES & TECHNIQUES

All Reasonable Methods Used to Discover/Locate Wells

Equitrans Statement: Equitrans retained the services of an environmental and engineering consultant, Woodard & Curran, with the objective to access and acquire available public and private well information pertaining to the CONSOL's Panel 5B in the Swarts Field. The specific objective was to collect and evaluate the respective sources of well information to identify and locate all known oil and gas wells in the Swarts Field area storage stratum and corresponding area and provide pertinent information with respect thereto. Where needed to verify identity and location, additional research and field verification were conducted.

A total of 33 electronic databases were accessed for pertinent well information sourced from the following agencies/entities:

- IHS Markit
- Pennsylvania Department of Environmental Protection (PADEP)
- Pennsylvania Spatial Data Access (PASDA)
- Pennsylvania Department of Conservation and Natural Resources (PADCNR)
- Greene County Geographic Information Systems (GIS) portal
- PA Topographic and Geologic Survey – PA Geologic Data Exploration (PAGEODE)
- Frac Tracker
- FracFocus

In addition to the electronic databases, inquiries were made to several local and regional agencies (e.g., libraries, historical societies) to obtain supplemental source materials including farmline maps, periodicals, and books. Agencies contacted and/or visited included:

- Greene County Historical Society Museum
- Cornerstone Genealogical Society
- Greene Connections
- Eberly Library Waynesburg University
- West Virginia University
- PADCNR

The detailed narrative and references (Appendices 2 and 3, respectively) describe the combination of available on-line, electronic databases and other local and regional (hardcopy) references researched, acquired, georeferenced, and incorporated to construct a complete set of well identification and location references pertinent to the Swarts Field.

Based on the synthesis and incorporation of historic and current electronic and hardcopy well records into a georeferenced GIS database, Woodard & Curran created GIS layers to assess position, type, function, and status of wells. As would be expected, discrepancies were noted for

locations not matching to the known survey of wells. In lieu of strict positional comparison, supplemental metadata information was evaluated to permit assignment of these "additional" locations to known locations. Discrepancies can generally be attributed to:

- Source accuracy where historical (farmline) maps may have used uncontrolled "artistic license" to place wells at locations on hardcopy references.
- The scanning, digitization, and georeferencing process, while robust, can introduce subtle shifts in position (typically resolved by proximity to known well location and type/function).
- Other electronic databases may have transcription errors for which there is no record of original data acquisition to verify accuracy.

On July 18, 2019, Woodard & Curran performed supplemental field activities in the Panel 5B area to verify the existence of several potential locations, whether visually or by use of a magnetometer. To complement the field component, historical aerial photography and topography between 1939 and 2003 were reviewed for evidence of or the probability for oil and gas development activities in a 250-foot radius around each location. The combined results of the field and historical review resulted in the identification and location of the known wells in this Verified Statement.

Supplemental Methodology

Equitrans Statement: The following outline/narrative describes the additional sources reviewed to support well location verification.

Electronic Databases

A number of electronic databases were accessed to extract information pertaining to locations (and other relevant data) of wells in the area of interest.

1. Subscription systems (a.k.a. "data warehouses") including IHS Markit and PI Dwights had been historically accessed by Equitrans and combined with Greene Co. well info from Pennsylvania Internet Record Imaging System (PAIRIS). Note, IHS Markit owns PI Dwights and the information is sourced from the Pennsylvania Department of Environmental Protection (PADEP) Oil & Gas well records via data mining techniques. Regardless, IHS was accessed in June 2019 for current information.
2. PADEP
    a. Oil & Gas Reports (hyperlink) provides access to interactive reports including the Oil and Gas Operator Well Inventory. Report tables (data) for the respective townships (Center, Franklin, Morris, Washington) were downloaded and incorporated into the study area GIS system for this project on May 29, 2019.
    b. PADEP GIS Portal (hyperlink) downloaded and incorporated on June 7, 2019 from the following datasets:
        i. Oil & Gas Locations – Conventional
        ii. Oil & Gas Locations – Unconventional
        iii. Coal Pillar Locations Oil & Gas

iv. Conservation Wells Plugged
v. Oil & Gas Locations (OGL) – Oil & Gas Well
vi. Oil & Gas Locations (OGL) – Pit
vii. Oil & Gas Locations (OGL) – Land Application

c. PADEP Oil & Gas Mapping (hyperlink)
d. PADEP eFACTs (hyperlink)

3. Pennsylvania Spatial Data Access (PASDA; hyperlink) maintains a number of databases pertinent to the gas well and mining operations for the study area including:
   a. Active Underground Permit Boundaries (hyperlink) downloaded and incorporated on May 28, 2019 and June 7, 2019.
   b. Digitized Mine Areas (hyperlink) downloaded and incorporated on May 28, 2019 and June 7, 2019.
   c. PADEP Historical Gas Wells (hyperlink) downloaded and incorporated on May 28, 2019 and June 7, 2019.
   d. PADEP Oil & Gas Wells (hyperlink) downloaded and incorporated on May 28, 2019 and June 7, 2019.
   e. Historic Maps (hyperlink), based on the attribute table from PADEP Historical Oil & Gas Well information, downloaded and incorporated on May 28, 2019 and June 7, 2019. These maps were also used to verify georeferencing of data.
4. Pennsylvania Department of Conservation and Natural Resources (PADCNR)
   a. Farmline Maps (hyperlink) for Rogersville and Waynesburg quadrangles downloaded and incorporated on June 3, 2019.
   b. Other farmline maps in hardcopy format were located, scanned, georeferenced, and incorporated between June 8 and June 14, 2019. Hardcopy location information is provided under Other Reference Resources (below).
5. Greene County GIS (hyperlink) dialog with David Craft (Greene County GIS Coordinator) regarding information to support georeferencing the overall study area dataset resulted in the acquisition and incorporation of additional layers for wells, permits, county centerlines and streams on June 19, 2019.
6. PA Topographic and Geologic Survey – PA Geologic Data Exploration (PAGEODE) tool (hyperlink) - Electronic files reviewed and searched for the review area included the following:
   a. Information Circular 16 - No specific oil or gas well locations or data for the project area. Nearest Deep Wells referenced are in extreme western Greene County and central Washington County.
   b. Bulletin M 32 - Provided information on reserves, production and location of oil & gas pools. No specific oil or gas well locations or data for the project area.
   c. Bulletin M 46 - Provided a map of the gas storage fields in Pennsylvania. Hunters Cave and Swartz storage fields were identified in the report (Plate 1, #23 & #25, respectively). However, no specific oil or gas well locations or data were illustrated for the project area.
   d. County Report 30 – Page 124 reported 4 deep wells drilled: 5,322 feet (Aleppo Township), 4,398 feet (Perry Township), >4,000 feet (Scott Farm, Bristoria Field)

and 3,780 feet (Wayne Township). Plate 2 included a map with geologic structure and oil and gas wells. There was no associated table for the gas wells on Plate 2.

e. Map 44 – Map shows a number of dry holes and producing gas wells, however, there was no associated table for the wells.
f. Map 3 – Provides the location of oil and gas fields in Pennsylvania. Swartz West Storage (979), Swartz East Storage (980) and Hunters Cave (981) are illustrated on the map. There was no associated table for the wells nor were any wells depicted on the map.
g. M 54 - Does not include the study area.
h. Special Bulletin 1 – Includes oil and gas well information on a table and wells shown on figures.
i. M 95 – Shows locations of coal-bed methane gas pools and locations of wells on maps. There was no associated table for the wells.
j. W 63 – Contains information on water wells but no information specific to oil or gas wells.
k. USGS Atlas 121 - Waynesburg Structure and Economic (Map) - included the locations of oil & gas wells. There was no associated table for the wells nor were any wells depicted on the map.
l. USGS Atlas 146 - Rogersville Quad Structure and Economic (Map) - included the locations of oil & gas wells. There was no associated table for the wells nor were any wells depicted on the map.
m. OF 00-01 - PA Coalbed Methane Wells Spreadsheet (cbm_wells_spreadsheet.xls).

7. Frac Tracker (hyperlink) well attribute data downloaded and incorporated on May 29, 2019.
8. FracFocus (hyperlink) well attribute data downloaded and incorporated on June 17, 2019.

Other Reference Resources (Hardcopy)

In addition to the available electronic databases, inquiries were made to several local and regional agencies to supplement research pertinent to the study area. A listing of each office and description of findings is provided below. Where possible, all information reviewed and/or acquired was scanned, georeferenced, and incorporated into the study area GIS dataset to complete the due diligence for well information and location.

1. Greene County Historical Society Museum (hyperlink)
    a. Contact: 918 Rolling Meadows Road, Waynesburg, PA 15370; 724-627-3204; Matt Cumberland.
    b. Called June 4, 2019 @ 10:10 and June 5, 2019 @ 13:58 and discussed with Mr. Cumberland the availability of oil & gas well information for the north central region of Greene County. Mr. Cumberland indicated they have an entire room dedicated to oil & gas and maps from the turn of the century dating between 1897 and 1916. However, due to current renovations of the facility and (re)cataloging all their archives, there could be no access to the archives at least for the next year until the work is complete.

c. Mr. Cumberland suggested contacting The Cornerstone Genealogical Society as he was aware they possessed some of the oil & gas records. He also suggested searching for a book by Thad Swestyn (which Cornerstone may have a copy) for reference to the O&G industry (see below).

2. Cornerstone Genealogical Society (hyperlink)
   a. Contact: First Greene County Courthouse – Annex, 144 East Greene Street, Waynesburg, PA 15370; 724-627-5653; David Cressy (hours 13:00-16:00 M-F & 10:00-15:00 Sa).
   b. Called June 4, 2019 @ 10:29 (left VM) and June 5, 2019 @ 14:03 and spoke with Mr. Cressy regarding the search for oil & gas wells in north-central Greene County. Mr. Cressy indicated they did have some maps, but specifically referenced a book by Thad Swestyn entitled "Oil & Gas Well Locations Greene County, Pennsylvania 1863-2013" (ISBN 978-1-304-75582-7; self-published) which has many maps and references to wells, gas storage, mining, and so on. Mr. Cressy also pointed out several websites Mr. Swestyn runs including:
      i. http://www.gaswellbooks.com/ - abovementioned book was for sale here.
      ii. www.genealogicalsurveyor.com (inaccessible; error upon attempting to access).
   c. Jonathan Taylor (JT; Woodard & Curran): called Mr. Cressy on June 7, 2019 @ 13:40 to arrange an appointment to review maps and other material on June 11, 2019.
   d. June 11, 2019, JT visited the Cornerstone Genealogical Society, met Mr. Cressy, and reviewed the book by Thad Swestyn entitled "Oil & Gas Well Locations Greene County, Pennsylvania 1863-2013." Upon review, select maps/material from the book were photocopied and subsequently scanned and georeferenced between June 12 and 14, 2019.
3. Greene Connections (hyperlink) included several additional links to other potential sources of information:
   a. Greene Connections – Resources/Maps - Rainey's farmline map of Greene County, Pennsylvania (1897) (hyperlink); while parcels were noted on the map, no additional or specific well information was available.
   b. Greene Connections – Resources/Repositories - Carmichaels Area Historical Society (hyperlink); located in Carmichaels, PA; 724-966-2731. Several attempts to contact have been made since June 4, 2019 (phone rings "busy").
4. Eberly Library Waynesburg University (hyperlink)
   a. Contact: 51 W. College St., Waynesburg, PA 15370; 724-852-3278; John Thompson.
   b. Called June 4, 2019 @ 10:50 and spoke with John Thompson who indicated they have some records though (they were) not well organized (perhaps some USGS maps and Greene Co. Atlases). He indicated he would spend a couple days looking and would get back to Woodard & Curran (Teeling). No contact since June 4, 2019.

c. Mr. Thompson also suggested contacting Cornerstone Genealogical Society and Greene Co. Historical Society (above) and posited the Greene Co. Courthouse could have records (though more likely related to deeds/leases; as expected).

5. West Virginia University (hyperlink)
    a. Contact: 1549 University Ave., P.O. Box 6069, Morgantown, WV 26506-6069; 304-293-4040 (gen); 304-293-9964 Tim Berge (Science Librarian)
    b. Thesis and Dissertations (hyperlink)
        i. Searched electronic archives for: "Greene County; Gas Wells, Gas Storage, Gas Storage Wells, Oil & Gas Wells".
        ii. No definitive "hits" for Thesis and/or Dissertations.
    c. Maps, Atlases, and Gazetteers (hyperlink)
        i. Called June 4, 2019 @ 11:41 and spoke with Tim Berge who had directed Woodard & Curran to the website under Library/Collections and noted that all collections for the Maps are located at the WV Regional History Center in the downtown library and suggested calling ahead to advise the staff what materials might be reviewed.
        ii. Searchable Map Collection summary was available as a downloadable PDF (hyperlink). WVU Control # 1237 references a farmline Map which covered Greene County for which Woodard & Curran had already obtained a copy.
    d. Newspaper Articles – a general internet of searchable articles for Greene County did not reveal any additional information or "hits."
6. PADCNR
    a. Contact: Pittsburgh office, 500 Waterfront Drive, Pittsburgh, PA 15222; 412-44204235; Contact name: Renee; (admin).
    b. Woodard & Curran contacted office personnel on September 23, 2019 and obtained a visitation appointment for September 24, 2019 to perform supplement review and research on the Exploration and Development Well Information Network (EDWIN) regarding current and/or historical well location status.

Exhibit D

Verified Statement Template

(attached)

CONFIDENTIAL AND PRIVILEGED – SETTLEMENT DISCUSSIONS
PA DEP -- 5/21/2019

Underground Storage Field
Verified Statement Submittal Template
Issued May 2019

DISCLAIMER:

This document describes the information that Underground Natural Gas Storage Operators should provide to the Department of Environmental Protection (DEP or Department) to meet the requirements of Subchapter C of the Oil and Gas Act, 58 Pa.C.S. §§ 3231 – 3237 (the "2012 Oil & Gas Act"); and the format in which that information should be provided to facilitate efficient review by the Department. The descriptions herein are neither an adjudication nor a regulation, and the Department does not intend this document to supersede, amend, or otherwise modify statutory or regulatory requirements, including Subchapter C of the Oil and Gas Act, or 25 Pa. Code Chapter 78. The definitions set forth in 58 Pa.C.S. § 3202 are hereby incorporated by reference and any defined word or phrase used herein shall be deemed to have the meaning ascribed therein.

DEFINITIONS:

Verified Statement – complete information package, as required by 58 Pa.C.S. § 3234(b). *Verified Statement Attestation* – signed, single-page, paragraph attesting to the completion of the Verified Statement in accordance with the requirements of the 2012 Oil & Gas Act and this document.
Producing Well – A penetrating well that produces gas or oil and has or may have been drilled into or through the storage stratum of the storage field. This does not include observation, storage, abandoned, or plugged wells.
Underground Natural Gas Storage Operator/Storage Operator/Operator – a person who operates or proposes to operate a storage reservoir as an owner or lessee.
Formally Credentialed Individual – a geologist or engineer who, through a combination of education, experience, and certification from a professional organization other than the Commonwealth's licensing board (*e.g.*, AIPG, SPEC, AAPG, etc.), demonstrates competency in the field of underground natural gas storage operations.

TEMPLATE:

This document presents a methodology for Underground Natural Gas Storage Operators to satisfy the Verified Statement submission requirement in 58 Pa.C.S. § 3234(b). To provide for efficient review of the Verified Statement by DEP, Storage Operators should submit a comprehensive package that includes all information required for the Verified Statement. Two (2) paper copies of the package should be submitted to the DEP Oil and Gas District Office with responsibility for the area where the storage operation is sited. The paper copies may be compiled in a single binder or multiple binders. One (1) paper copy of the Verified Statement should be submitted to any Coal Operator(s) responsible for the affected operating mine. In addition to the paper copies, a stand-alone electronic version (portable document format; *i.e.* .pdf) of the Verified Statement should be submitted to the Department. The Department requests all other electronic files which may assist in the Department's efficient review of the Verified

Statement, including but not limited to tables, graphs, images, and electronic boundary mapping files (*e.g.*, Geographic Information System (GIS) and/or Excel). These items may be submitted electronically (*e.g.*, e-mail or through a file transfer protocol site) or via compact disc or flash-memory data stick. Due to the size of the submittal, it may be delivered in multiple volumes (*i.e.*, Volume 1, Volume 2, etc.).

Verified Statement Submittal:
- *Two (2) Bound, Paper Copies of Verified Statement*
- *One (1) Portable Document Format (.pdf) File of Verified Statement*

Requested Supplemental Information To Verified Statement:
- *Well List in Excel format (.xls or .xlsx)*
- *Field Boundary/Well Location Data in .dwg or .shp format*
- *Other Pertinent Electronic Data*

(i) **Title Page** – Title, Storage Reservoir Name, County(ies), Township(s), Operator, Original Date, and Revision Date.

(ii) **Verified Statement Attestation** – single page, paragraph or paragraphs attesting to the completeness and correctness of the submission. Must include signature and date of an Operator Employee with overall responsibility/accountability for the storage field. This will generally not be the engineer or geologist who prepared the map and table, unless the engineer or geologist is a person with overall responsibility/accountability for the storage field.

The following language shall be appended to the Verified Statement as the Verified Statement Attestation prior to signature of the Operator Employee with overall responsibility/accountability for the storage field (described above).

I certify that the information provided for this Verified Statement for _____ is complete and correct to the best of my knowledge, information, and belief. I further certify that I am an authorized officer or delegated agent of the company responsible for submitting the Verified Statement. I understand that the statements and information contained herein are made subject to the penalties of 18 Pa.C.S. § 4904 (unsworn falsification to authorities).

_____

(iii) **Table of Contents** – References all narrative sections, maps, tables, appendices, etc.

(iv) **Summary** – Executive summary describing germane information about the storage reservoir, including but not limited to the storage reservoir's location, storage horizon(s), operating pressure, field volume, number of wells addressed in the Verified Statement, and well status.

(v) **Narrative** – Written summary divided into logically sequenced sections (*i.e.*, background, methodology, results, schedule, etc.). At a minimum, this will describe the acquisition and

compilation of all necessary and reasonably available information to fulfill the requirements of Pa. C.S. §§ 3231(a) and 3234(b). This summary should include documentation that the requirements of 58 Pa.C.S. § 3234(a)(1) have been satisfied. A descriptive list shall be included of every known, reasonable method employed by the operator for discovering and locating wells which meet all the following criteria: (1) have or may have been drilled into or through the storage stratum, (2) overlie the storage reservoir and reservoir protective area, and (3) are located within the coal boundaries of the operating coal mine should be included.

(vi) **Map** – Large size format (ANSI D (22" x 34") or ANSI E (34" x 44")), stamped by a Pennsylvania-registered (licensed) engineer or registered geologist with competency in the field, or signed by someone with an equivalent level of experience (non-licensed/non-registered professionals should be formally credentialed; append a *curriculum vitae* (CV)); display standard map symbology and items (*i.e.*, north arrow, legend, title block with revision history, scale, coordinate grid, landmarks). A local grid system (*i.e.*, A19) could be included to assist in locating wells from the well table (suggest 1,000-5,000 foot grid). Appropriate scale should be utilized to ensure sufficient level of detail. Coordinate system and datum should be defined. Multiple maps may be submitted. Map should be folded and placed in a sleeve within submittal binder.

(vii) **Well Table** – Large size format data table (ANSI D or E) cross-referenced to map. Include title block and area to be stamped by a Pennsylvania-registered (licensed) engineer or registered geologist with competency in the field, or signed by someone with an equivalent level of experience (non-licensed/non-registered professionals should be formally credentialed; append a CV). Table should include all pertinent well information, including what associated documentation is available. Table should indicate if well was plugged prior to April 18, 1985. Table should be folded and placed in a sleeve within submittal binder. Minimum data for each well identified above should include, to the extent in the Operator's possession or is otherwise reasonably available:

1) API (permit) number indicating 3-digit county code, hyphen, and 5-digit sequential identifier)
2) Operator internal or historical well number
3) Name of operator
4) Well Type (*i.e.*, conventional, unconventional, storage (injection/withdrawal),observation (monitoring), etc.)
5) Well Status (*i.e.*, active, abandoned, historically plugged (pre-Act), Oil and Gas Act of 1984 plugged, plugged to current standards, etc.)
6) Well Location (active reservoir area, reservoir protective area)
7) Latitude (decimal degrees, note datum)
8) Longitude (decimal degrees, note datum)
9) Northing (State Plane, feet, note datum)
10) Easting (State Plane, feet, note datum)
11) Collar elevation (feet Above Mean Sea Level)
12) Local Grid Cell (*i.e.*, A19) on master map
13) Spud Date.
14) Recondition Date (if applicable)
15) Location Plat (Y/N)

16) Well Diagram/Schematic (Y/N)
17) Well Record/Completion Report (Y/N)
18) Recondition Report (Y/N)
19) If Reconditioned, does well reconditioning meet current standard? (Y/N)
20) Plugging Certificate (Y/N)
21) DEP (or former DER) approved alternate plugging method? (Y/N)
22) If Plugged, does well plugging meet current standard? (Y/N)
23) If Plugged, indicate plugging date
24) Depth of Production Zone 1, Production Zone 2, Production Zone 3 (feet)
25) Producing Lithologic unit of Production 1, Production 2, Production 3 (Fifty Foot, Big Injun, etc.)
26) Initial Rock Pressure (psi)
27) Initial Rock Pressure Shut-In Time (duration in hours, *i.e.*, 24, 72, etc.)
28) Initial Flow (thousand cubic feet per day (mcf/day))
29) Depth of Workable Coal Seams encountered (separate column by seam; *i.e.*, Waynesburg, Pittsburgh, etc.)

(viii) **Appendices** –

Appendix 1 – Well Records and/or Other Documentation – catalogued by well

The following information should be compiled for each penetrating well identified in the Well Table:

1) Well Diagram/Schematic (indicate all known annular materials)
2) Well Completion Report
3) Original Well Drilling Record
4) Certificate of Well Plugging
5) Well Plat
6) Other Pertinent Well Records (approved alternate plugging method, etc.)
7) At the end of each Well's section, the operator should indicate if the well is or is not in compliance with 28 Pa.C.S. § 3234 and the rationale applied to justify each compliance-status determination. For wells that are not in compliance, the operator should identify a corrective action plan and schedule. This criterion does not apply to Producing Wells, as defined in this document.

Note: a) To document that records were not inadvertently omitted, if, after a diligent search by the storage operator, certain records were not located, a blank page representing the record that was not located should be included in the series of documents about the well. Include a list of the sources which were unsuccessfully searched.

b) Well groups should be placed into the Appendix in API numerical order. Wells without an API number should be listed by alternative number (these wells should be assigned API numbers in the future through coordination with DEP and using existing processes (*e.g.*, well adoption or abandoned well investigation process)).

Appendix X (number each additional appendix sequentially starting at 2) – Supplemental Information-

May include internal company documents, miscellaneous reports, etc. Examples may include Field Flow Rate Data and Map, Well Inspection Reports, Consultant Reports, Emergency Action Plan, etc.

Equitrans Swarts Storage Field - Panel 5B

Stable Carbon and Hydrogen Isotopic Analyses

(attached)

Element Material Technology
2129 West Willow Street
Scott, LA
70583-5301 USA

P 337 232 3568
F 337 232 3621
T 888 786 7555
info.scott@element.com
element.com

Report No: 245048 245048-1 - **Date:** 10/11/2019

For: EQUITRANS MIDSTREAM
Attn: JEDEDIAH FOLEY
317 EAST ROY FORMAN HWY
WAUMESBIRG, PA 15370

Sample Identification:
Company: EQUITRANS MIDSTREAM
Field: PA SOUTH
Lease: WOODS METER
STA #:

Sample Data: **Date:** 9/23/2019 **By:** JED FOLEY
PSIG: 839.4 **Temp:** 60 **DEG. F.**

Remarks:

CYL # 1359

Sample Type: SPOT **Effective Date:** NP

Component	Chemical mol. %	$\delta^{13}C$ ‰	δD ‰	$\delta^{15}N$ ‰
Carbon Monoxide	nd			
Helium	0.0152			
Hydrogen	0.0101			
Argon	nd			
Oxygen	nd			
Nitrogen	0.24			
Carbon Dioxide	0.21			
Methane	94.92	-39.99	-168.2	
Ethane	4.24			
Ethylene	nd			
Propane	0.314			
Propylene	nd			
Iso-butane	0.0158			
N-butane	0.0256			
Iso-pentane	0.0032			
N-pentane	0.0023			
Hexanes +	0.0077			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1048
Specific gravity, calculated: 0.581

Janet Cox, Customer Service Supervisor

Equitrans Swarts Storage Field - Panel 5B

Storage Integrity Plan

(attached)

STORAGE INTEGRITY PLAN
EQUITRANS MIDSTREAM
2019

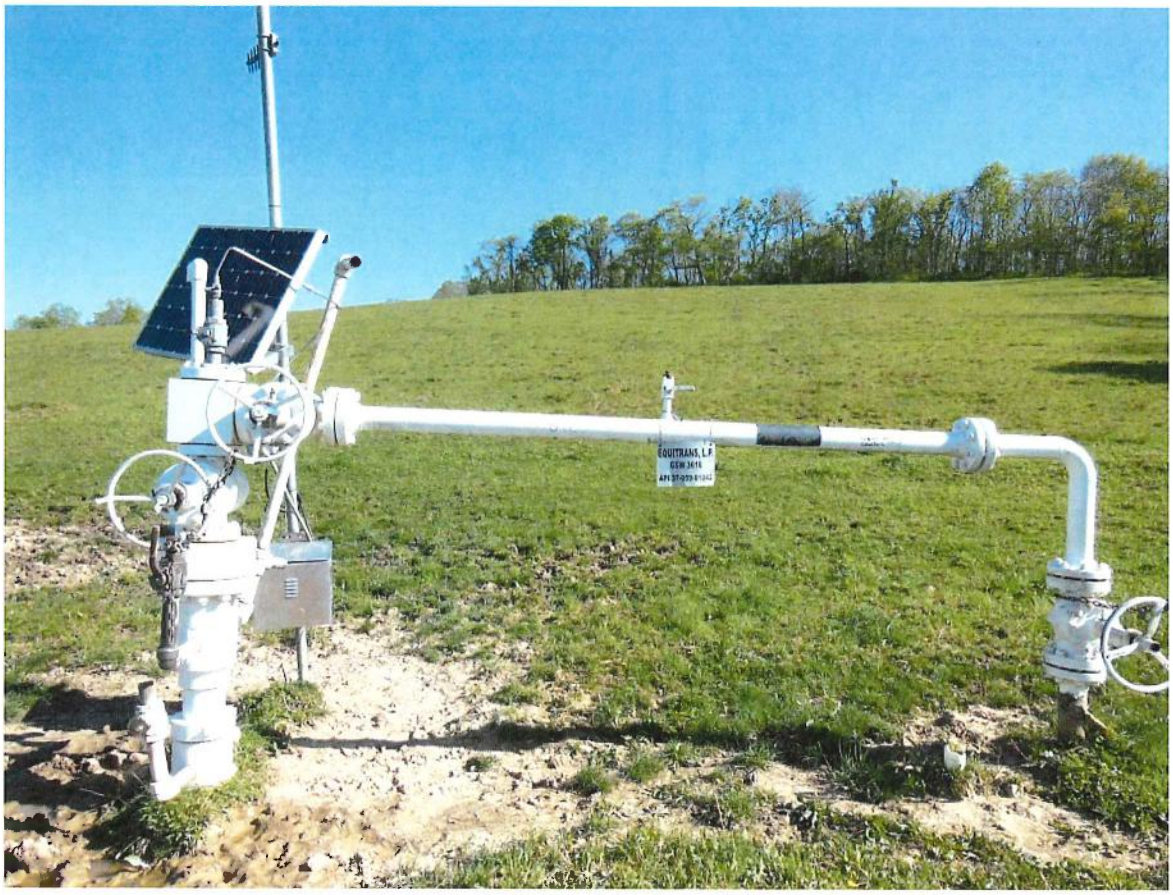


Table of Contents

Revision History

DATE	REVIEWED BY	RESULTING REVISIONS
Jan. 2005	Tim Habovick, Brian Hall, Tom Suhy	• Developed EQT Storage Integrity Plan
Nov. 2009	Andrea Horton	• Revised inspection report locational data; highlighted specific tasks and who was responsible
Nov. 2010	Andrea Horton, Brian Hall, Arman Yussefabad	• Updated all Company Standards with the most recent reference to the EQT O&M Manual and Safety Standards; • Added note on Follow-up to the monthly storage inspections, regarding apparent well damage; • Updated all Sharepoint site link information; • Updated Section II-C, Storage Well Emergency Response
Jan. 2011	Brian Hall	• No revisions
Jan. 2012	Andrea Horton	• Complete revision of "Storage Integrity Plan," reducing document to actions involving well facilities only, and removing all Operational maintenance tasks that are covered in EQT Standards and Procedures documents
Sept. 2012	Andrea Horton	• Storage Guidelines revised to incorporate references to PA and WV regulations on storage wells
Feb. 2014	Brian Hall, Andrea Horton	• Updated surveillance logging frequency based updated industry standards
Jul. 2014	Jack Shaffer, Brian Hall	• Added AVC Storage pool data • Update wording as needed to include AVC.
Mar. 2015	Brian Hall, Jack Shaffer	• Minor changes throughout
Oct. 2016	Gerry Smith, Brian Hall, Jack Shaffer, Andrea Horton, Nesinka Benkovski	• Updated with citations to API RP 1171 and renamed "Storage Integrity Plan", in accordance with State and Federal requirements.
Dec. 2017	Gerry Smith, Brian Hall, Jack Shaffer	• Added Reservoir Integrity tasks • Included SOP references • Minor changes throughout
Dec. 2018	Gerry Smith, Brian Hall, Jack Shaffer	• Change company name from EQT to Equitrans Midstream • Incorporate recommendations from PHMSA audits • Add 3rd Party non-storage well mechanical integrity data process • Added more specific PA and WV regulations • Added annual Inventory Verification requirement • Modified gauge verification frequency • Added reference to Equitrans policies regarding Environmental, Health and Safety, Training Requirements, Emergency Procedures, Management of Change process, and Control Room Management process
Apr. 2019	Gerry Smith	• Add Swarts/Hunters Cave special operating conditions during CONSOL mining (page 15)

Introduction

EQT Midstream holds primary responsibility for operating and maintaining the functional integrity of Equitrans storage reservoirs. The overall storage mission is to:

a) provide reliable storage service,
b) ensure the integrity of all storage wells and reservoirs, and
c) ensure safe operations.

This plan outlines the essential operational maintenance practices needed to ensure the integrity and safety of storage operations. They are to serve as a guide for both the Storage Department (Storage) and Operations personnel.

The primary topics covered herein are focused on operational maintenance of the storage wells and reservoirs only. All other appurtenant facilities are maintained by Operations personnel following established EQT Standard Operating Procedures.

All storage well inspections and recurring maintenance tasks conducted by Operations personnel are the subject of monthly Operations work-orders within the Enterprise Asset Management (EAM) System. Data gathered during scheduled well inspections are entered into the system, transferred to the EQT Data Warehouse, and are then accessible via numerous reports. As needed, the EAM system will generate accelerated maintenance reports, to facilitate required maintenance follow-up tasks.

This document has been developed based on state and federal storage requirements and general oil and gas well requirements. The codes reviewed include:

PA Code, Title 25, Subchapter H, Underground Gas Storage, Section 78
Pennsylvania's Oil and Gas Act (Act 223) Title 58, Chapter 11 Oil and Gas Act
PA Oil and Gas (58 PA.C.S.) – Omnibus Amendments, 2012, P.L. 87, No. 13 Amending Title 58, Chapter 32 Development.
WV Code, Chapter 22, Article 9, Environmental Resources, Underground Gas Storage Reservoirs
WV Code, Title 35 Legislative Rule Department of Environmental Protection Oil and Gas Series 4 Oil and Gas Wells and Other Wells
API RP 1171: Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs, 2015.

The Equitrans storage fields are located in both Pennsylvania and West Virginia. The more comprehensive requirements of either the Pennsylvania Code or the West Virginia Code has been applied to all Equitrans storage fields. Federal regulations (PHMSA's Interim Final Rule) apply to all of Equitrans storage reservoirs.

Storage conducts an annual review of this document and makes note of changes in the revision history on page 3.

Summary Table

The table below provides a summary of all operational maintenance tasks outline herein.

Task	Operations responsibility	Storage responsibility
Field Inspections	• Check wells and document all measured pressures and required items in the work orders • Follow up / bring in other groups as needed • Review issues with Storage monthly	• Plot pressure data • Provide secondary follow-up where needed • Review issues with Operations monthly
Annual inspection of plugged wells	• Inspect wells • Document all findings • WV Ops to start in 2017	• Provide listing of all wells that are to be inspected
Spring and Fall shut-in tests	• Shut-in wells; • Document all measured pressures and required items in the work orders	• Develop test schedule • Compile and analyze shut-in pressure data for annual inventory verification analysis
Use of Remote Terminal Units	• Download data where needed • Change batteries and conduct routine maintenance	• Plot and analyze pressure data • Identify communications issues
Well performance testing	• Conduct all field testing	• Schedule testing • Coordinate efforts with Gas Control • Analyze test data
Total depth verification using slickline	• Conduct slickline check on designated wells	• Identify wells to check, based on logging and/or testing data
Casing corrosion inhibitors	• Conduct gelling	• Identify wells to gel
Well access	• Review road rankings from monthly inspection reports • Identify O&M funds for road repairs	• Work with Operations to identify roads needing capital restoration
Well security	• Ensure valve security and lock-out/tag-out where needed	• Ensure valve security and lock-out/tag-out where needed
Valve maintenance	• Follow EQT Midstream Standard Operating Procedures	
Emergency and other repairs	• Oversee O&M repairs	• Oversee capital repairs • Oversee O&M repairs
Surveillance logging	• Assist in the field as needed	• Schedule logging • Identify O&M budgetary needs for logging • Evaluate log results
Non-storage wells		• Maintain semi-annual update of well list identifying all wells within 3,000' of active storage boundary

Outside drilling	• Serve as eyes and ears in the field, noting activity of interest	• Monitor all activity in and around storage fields using I.H.S. and EQT mapping systems
Maximum operating conditions	• Be familiar with maximum inventory and pressure levels	
Special operating circumstances	• Open and shut-in wells as identified after spring and fall shut-in tests, and when deemed necessary	• Track operational status of all storage wells

In all cases, the first line of follow-up for storage well maintenance is through Operations. The second line of follow-up is through Storage.

A. SAFETY

1. General Safety Practices

API 1171 10.2.1

All employees and contracted employees are to follow EQT safety guidelines at all times.

2. Training

API 1171 11.12

All employees and contracted employees are required to have documented training for their assigned tasks and demonstrate familiarity with the applicable procedures.

B. FIELD INSPECTIONS

1. Monthly Well Inspections

PA Code, Subchapter H, Underground Gas Storage, Section 78.402a;
WV Code, Title 35, Article 4, 11.6;
API 1171 9.3.2, 10.5

Every storage well is to be inspected on a monthly basis. The inspections should be spaced at approximately even time intervals. Whenever possible, all wells in a given storage field should be inspected on the same day.

See SOP STR_OPS_Monthly_Well_Inspections

Accurate, detailed reporting of all items listed below, as well as any other issues of note at each well site, is essential to ensure storage well and reservoir integrity. The personnel making the monthly well inspections serve as the primary "eyes and ears" in the field. Any and all issues must be identified and reported. Data to be noted and recorded during the monthly inspection shall include:

Item	Inspection Data	Follow-up Notification Needed
Date and time of inspection		
Wellhead pressure, psig		If pressure is abnormal
Remote terminal unit (RTU) pressure, psig		If RTU and wellhead pressures vary by more than 10 psi
Well status/ Valves in correct position	In line, shut-in, not connected, frozen	If well is frozen
Verify Security		Signs of vandalism
Assess for damage		Potential tree falls, persistent rock falls, vandalism
Well sign visible		Well sign damaged/missing

Signs of Leakage		Wellhead leaks that cannot be fixed during inspection. Signs of underground leakage
Annular vent gas volume or other gas leakage	Is there vent gas?	Leave annular vents open, unless directed otherwise by Storage Follow-up needed to obtain measurement; In PA, report any leakage in excess of 5 Mcfd (5,000 cubic feet/day)
Road Ranking, 1-5	1 = Road is fine 2 = Passable, needs general maintenance 3 = Only passable by truck in fair weather 4 = Road is impassible with truck /only accessible by ATV in fair weather 5 = No road / current road is impassible by truck or ATV; must walk to well	Notify supervisor for changes in condition that require road repair
Corrosion	Acceptable – Fixed - Previously reported - Issue	Report new issues to supervisor
Encroachments	Note any new encroachments within 200 feet of the well	

2. Annual inspection of the gas storage active and protective area at end of injection season when storage pressure is at its highest

PA Code, Subchapter H, Underground Gas Storage, Section 78.402c
API 1171 9.3.2

To ensure reservoir integrity, identified plugged and abandoned wells penetrating the storage horizon within the active and protective boundaries are required to be inspected for leaking gas or signs of leakage.

Item	Inspection Data	Follow-up Notification Needed
Plugged wells in active pool	Well/monument condition	Follow-up needed for any material changes, including encroachments, evidence of leakage, etc.
Plugged wells in protective area		
Area inspection	Any conditions that may indicate gas leakage or public hazard	

3. Spring and fall shut-in tests

PA Code, Subchapter H, Underground Gas Storage, Section 78.403, Gas Storage Well Integrity Testing;
API 1171 9.5.5

To facilitate inventory verification studies and confirm the integrity of each storage reservoir, all EQT storage pools will have a semi-annual shut-in test, at the approximate high and low inventory levels of each pool. Shut-in testing involves isolating storage wells from the storage gathering system and allowing the pool pressure to stabilize.

Pressures read at the end of the shut-in period are used in inventory verification (see D9 Inventory Verification).

See SOP STR_OPS_Inventory_Verification_Shut-In_Test

The specific responsibilities for the semi-annual shut-in tests are outlined in the table below:

Item	Who is Responsible	Note
Scheduling/duration of tests	Storage – Gas Control - Operations	Preferably 5-day tests, at near high and near low inventory. Attempt to test consistently each season
Pressure gauge verification	Operations personnel	The accuracy of gauges must be verified according to the manufacturer's recommended frequency.
Well isolation	Operations personnel	Wells should be shut in so that they are isolated from the pipeline but open to the reservoir. The recorded pressures must be the reservoir.
Pressure readings	Operations personnel	Record instantaneous pressure at time of shut-in. On final day, record final shut-in pressure, along with date and time.
Turn wells back in line	Operations personnel	After obtaining **ALL** pressure readings, wells may be turned back in line.
Wells used selectively for injection/withdrawal purposes	Operations personnel	Some storage pools contain wells that are used selectively, such as for withdrawal only or for limited injections. These wells be identified by Storage, as needed.
Data analysis/ review	Storage	Data analysis is used to determine what gas loss adjustments and/or operational changes may be needed in each storage pool.

C. FIELD OPERATIONS

1. Use of Remote Terminal Units for Pressure Monitoring

API 1171 9.5.3

Remote terminal units (RTU's) have been installed on several storage wells for the purpose of monitoring storage pressures. Tracking of pressure data assists with the monitoring and identification of performance and integrity issues.

In many EQT Storage Pools, there is one designated storage indicator well, by which the storage reservoir pressure is monitored. This well may be an observation well (not connected to a storage pipeline) or an injection/withdrawal well that is kept shut-in and isolated from the storage gathering system. The wellhead pressure on the indicator well is read, stored, and transmitted by the RTU. The storage indicator pressures are transmitted to the EQT SCADA system, and displayed on the Storage Summary screen.

As noted in Section B1, the RTU's should be checked during the monthly storage well inspections. Differences of 10 psig or more between the RTU pressure reading and the measured wellhead pressure indicate the need for RTU calibration.

2. Well Performance Testing

API 1171 5.3.2

All EQT storage injection/withdrawal or withdrawal-only wells are candidates for performance testing to periodically monitor the capability of the well. Such testing is generally conducted during injection operations, using clamp-on ultrasonic flow meters and specially designed patterns of flow and shut-in, during which flow volumes and pressures are measured at the wellhead. The data from these tests are used to determine the well's flow potential, permeability of the storage formation near the well bore, the well's drainage radius, as well as down-hole factors that may limit well flow, such as water presence around the well-bore, turbulent gas flow, or the build-up of a mechanical barrier reservoir sand-face (skin damage).

Storage schedules the tests and coordinates the efforts with Gas Control. Operations personnel may conduct the testing.

3. Total Depth Verification Utilizing Slickline

Many of the EQT storage wells have open-hole completions, which have the potential for formation cave-ins. These can cause reduced flow from the well, since the wellbore becomes filled, covering the storage horizon. A slickline unit may be used to measure the total depth and determine whether the storage horizon is open to the full depth. Use of the slickline requires following the Well Entry SOP.

4. Casing Corrosion Inhibitors ("Gelling")

API 1171 9.3.2

To mitigate the potential for annular corrosion, the annular space in some EQT storage wells is filled with a corrosion inhibiting fluid. Storage will select the wells to be gelled, as needed.

See SOP STR_OPS_Maintaining_Annular_Gel_Volumes

5. Well Access

API 1171 10.3.1

Unimpeded access, whereby a company vehicle can safely drive to the well site from the nearest public road, is important to storage operations. In addition, access roads should be kept clear of low and overhanging branches to enable passage of logging trucks, drilling rigs, and/or other related equipment that might be needed for maintenance or emergency operations. In the course of planning for annual storage maintenance work, information regarding needed road maintenance work should be reviewed by Storage and Operations.

6. Well Security

API 1171 10.2.2

All valves must be secured. Any time that work is ongoing on a well; appropriate equipment must be locked and tagged out as per OMP 081 Inspect and Maintain Valves: Valve Inspection Procedure, step 9.

See EQT Safety Standard 9.9 Lockout/Tagout Control of Hazardous Energy Sources

7. Valve Maintenance

API 1171 9.3.2

Storage well valves must be maintained in good, secure working order. Valves must be inspected annually and maintained following the standards in the EQT Midstream Standard Operating Procedures.

See SOP OMP_081_Inspect_and_Maintain_Valves

8. Emergency Repairs

PA Code, Subchapter H, Underground Gas Storage, Section 78.405, Emergency Repairs

When emergency repairs are necessary, efforts should be coordinated between the Storage and Operations personnel. PADEP requires notice within 24 hours of repairs and a written explanation within 5 days of the emergency, including an explanation of the emergency and the corrective action taken or planned. PHMSA requires the filing of an Incident report if there is an unintended release of gas exceeding 3Mcf, death or personal injury resulting in patient hospitalization, or property damage >$50,000. PHMSA requires the filing of a Safety report for findings that compromise well or reservoir integrity (casing leaks, cracks, material defects, earthquakes, etc…). If permits are required for the corrective action, an application must be filed within 10 days.

9. Other storage well work

API 1171 6.9

All storage well work, such as wellhead replacements, plug and abandonments, deliverability recovery, re-conditioning, etc., must adhere to all state permitting, construction, and restoration regulations. All such activities are required to be supervised by a qualified employee or contractor. Any workover or maintenance that repairs, replaces or modifies the existing production string of a storage well is required to conduct a well mechanical integrity test to demonstrate casing integrity.

See SOP STR_OPS_Well_Entry

See SOP STR_Well_Mechanical_Integrity_Test

10. Storage Well Emergency

API 1171 10.6.1

In the event of an incident involving loss of control and/or fire at a well site, the EQT Midstream Emergency Plan and the Storage Well Emergency Response Plan shall be implemented. Storage has an emergency form for each well, containing pertinent location, completion, and operational details located on the Gas Systems Planning Sharepoint site.

D. RESERVOIR AND WELL INTEGRITY

1. Geological characterization

API 1171 5.2.2

Each storage field has had all available geological data reviewed for all wells within the active and protective storage boundaries and incorporated well data from outside of the storage boundaries to evaluate the geology of the storage horizon(s). Collected data includes top and base elevations for formations surrounding the storage horizon, gross thickness, net pay, average porosity, and average water saturation where suitable well-log data exists. The collected data is used to create maps of the subsurface structure of the storage horizon, and isopach maps of the net pay, average porosity, PhiH and average storage water saturation, which are used in the reservoir models.

As new well data becomes available, the geologic mapping is updated in GeoGraphix annually. A periodic review of the each storage field is conducted every 5 years, which involves checking State databases for new log data within each mapping area.

2. Reservoir models

API 1171 5.3.2

Data from well testing, shut-in tests, geologic evaluations and system operations are utilized to construct a reservoir model for each storage field. Each reservoir model can be used to evaluate potential changes in operational methods and corroborate inventory verification and the potential for gas migration.

3. Casing and Cementing

PA Code, Subchapter D, Well Drilling, Operation and Plugging, Sections 78.71, 78.75, 78.81-78.87; PA Title 58, No 13, 3220-3221; PA Act 223 Section 601.207;
WV Code Chapter 22, 22-6-18&21; 22-9-5f; WVDEP Title 35, Series 4, 35-4-11; WVDEP Casing and Cementing Standards and Best Management Practices;
API 1171 6.3 & 6.4

New wells are required to meet State regulations, as required by State permits. Well workovers that require State permits will also need to meet State regulations.

4. Wellhead Equipment

PA Code, Subchapter D, Well Drilling, Operation and Plugging, Section 78.72l;
API 1171 6.2

All wellhead equipment should meet the standards of API 6a Specification for Wellhead and Christmas Tree Equipment, 30 CFR 250.806(a)(c).

5. Plugging and Abandoning Wells

PA Code, Subchapter D, Well Drilling, Operation and Plugging, Sections 78.75, 78.91-98;
WV Code Chapter 22, 22-6-23&24; WVDEP Title 35, Series 4, 35-4-13&14;
API 1171 6.7

All plugging and abandoning operations are required to meet State regulations, as required by State permits. Plugged wells will be added to annual inspection of plugged and abandoned wells within each storage field.

6. Environmental, Health and Safety

PA Code, Title 25, Chapter 78, Subchapter C, Section 78.51 - 78.66; Subchapter D, Section 78.74 & 78.77. PA Act 223 Section 601.208-209;
WV Title 35, Series 4, 35-4-16, 35-4-17, 35-4-19, & 35-4-20. WV Code Chapter 22, 22-6-6&7, 22-6-30;
API 1171 6.7

All well sites, wellheads and well designs are required to meet State and Federal environmental, health and safety regulations.

7. Risk Assessment/Risk Mitigation

API 1171 8

Storage uses the Joint Industry Task Force Risk Assessment Guidance to determine a probabilistic risk value for each storage well. Storage will identify mitigative actions based on each risk assessment (See ***Storage Well Risk Assessment Procedure*** for more details). Reassessment of each pool is to be performed periodically based on the acquisition of new surveillance logs, a modification/revision to the Guidance, or upon the occurrence of an event that may unexpectedly compromise the reservoir (i.e. earthquake, mine subsidence, production well casing failure, etc...).

8. Monitoring of monthly pressures and indicator wells

PA Code, Subchapter H, Underground Gas Storage, Section 78.402 & 403;
API 1171 9.5.3

Storage charts the pressures obtained from the monthly inspections and monitors the well pressure for abnormal conditions comparing the trend to previous years of gathered data points. Indicator wells for each field our monitored tracking reservoir pressure; indicator wells with RTU's will allow continual monitoring. The field indicator well RTU is monitored through SCADA and alarms will be sent if pressures reach warning points below the MAOP of the system. If the MAOP is exceeded, then the incident must be documented and reported to FERC.

9. Inventory Verification

PA Code, Subchapter H, Underground Gas Storage, Section 78.403d;
API 1171 9.4.3

Data collected during the Spring and Fall shut-in tested is required to be analyzed, yearly, to determine the integrity and performance of each storage field using appropriate methods including pressure vs inventory trends and reservoir modeling. The results of the analyses in combination with the book inventory is used to identify apparent gas losses and/or needed adjustments to the book inventory or pool operations.

10. Surveillance Logging

PA Code, Subchapter H, Underground Gas Storage, Section 78.403, Gas Storage Well Integrity Testing;
API 1171 9.3.2

Storage utilizes cased-hole inspection, or surveillance, logging to monitor the downhole condition of individual storage wells. The current surveillance logging suite includes gamma-ray/neutron, temperature, caliper, and flux-leakage. Where possible, Storage logs wells on a 15-year frequency not to exceed 20 years. As of 2018, logging schedule will aim to log entire fields each year to allow the reassessment of that fields risk analysis. All wells have been entered in EAM, which generates work-orders for well logging.

When needed, due to corrosion histories, past log anomalies, or for wells close to structures or public areas, Storage may use an accelerated logging frequency. Storage has an ongoing program to remediate wells that have restrictions that prevent logging. Surveillance logs that identify Class 4 features (60% metal loss or greater) require a prompt evaluation of the potential risk and what mitigative steps to put in place. When a Class 4 feature is greater or equal to 80% metal loss, a prompt assessment of the well safety needs to be performed, setting a temporary plug when risk of gas loss may occur prior to repairs or plugging can occur.

11. 3rd Party Non-storage wells

PA Oil and Gas Act 13, Subchapter C, Underground Gas Storage, Section 3231 & 3233 General gas storage reservoir operations;
API 1171 9.4.3

Storage maintains a listing of all wells located within the active storage pool limits, the protective limits, and an additional 1,000 feet beyond the protective limits, noting which wells have been drilled through the storage stratum. This list is be updated on a semi-annual basis. Wells penetrating storage are evaluated for risk (high, medium or low) based on available completion information. The evaluation of wells penetrating the storage horizon was conducted in 2012 and is updated as new well information becomes available.
Annually, all wells within the active, protective and additional 1,000ft boundaries that do not have location plats, completion reports or plugging affidavits are to be checked in the PADEP or WVDEP online databases for new information.

12. Outside Drilling

PA Oil and Gas Act 13, Subchapter C, Underground Gas Storage, Section 3231 & 3233, General gas storage reservoir operations;
API 1171 9.4.3

a) Storage tracks all available data on all wells planned near or within the EQT storage pools. This information is obtained from the Information Handling Services (IHS) well activity monitoring system. Areas of interest encompassing each storage pool are monitored daily to identify any permitted activity within the area (e.g., reworks, plugging, hydraulic-fracturing, new drills, drill-deeper, etc.). It is recommended to perform an IHS update for wells in each county that contains a storage field to ensure any new wells has been added to the database.

The information obtained from IHS is compiled, mapped, reviewed, and tracked to monitor any potential risks to storage operations. All available documents (location plats, completion reports and plugging affidavits) for wells within the storage boundaries are stored for each field. As needed, the Land and Legal Departments are notified to obtain assistance with lease and/or legal issues regarding drilling activity near or within the EQT storage pools.

b) PHMSA Interim Ruling requires that 3rd party production wells within storage to be contacted to ask for any available well integrity data regarding their wells. Storage is to send out this request letter by the end of January each year with a requested response time of March 31st.

E. OPERATING PARAMETERS

1. Maximum Operating Conditions

PA Code, Subchapter H, Underground Gas Storage, Section 78.404, Maximum Storage Pressure;
API 1171 5.4.3, 5.4.7

The certificated total reservoir capacity and maximum average wellhead pressures for each of the Equitrans storage reservoirs are listed below:

Pool	Counties	State	FERC Maximum Average Shut-In Wellhead Pressure (CP05-18)	Maximum Average Shut-In Well Pressure (State)	Total Certificated Maximum Capacity including Native Gas (CP05-18, CP15-553)
			psig	psig	MMcf

FERC Order CP05-18

Bunola	Allegheny, Washington	PA	890	890	7,300
Finleyville	Washington	PA	1,000	960	800
Hunters Cave	Greene	PA	950	1,000	6,700
Pratt	Greene, Washington	PA	900	850	9,300
Swarts	Greene	PA	1,000	1,000	2,600
Tepe	Allegheny	PA	1,000	1,000	1,275
Comet	Taylor	WV	1,000		5,300
Hayes	Marion	WV	700		193
Logansport	Marion	WV	1,000		3,700
Maple Lake	Harrison, Taylor	WV	780		2,400
Mobley	Wetzel	WV	900		7,400
Rhodes	Lewis	WV	975/925/890; Pools A/B/C		9,700
Shirley	Doddridge, Tyler	WV	400		3,800
Skin Creek	Lewis	WV	1,000		2,165

FERC Order CP15-553

Gamble-Hayden	Allegheny	PA	1,000	1,000	2,041
Rager Mountain	Cambria	PA	3,200	3,200	11,606
Truittsburg	Clarion	PA	900	900	2,781
Webster	Westmoreland	PA	660	660	974

In any instances where the State and FERC maximums differ, the minimum of the two values shall be used.

FERC requires the reporting of all incidents where either the maximum pressure or inventory is exceeded.

2. Special Operating Concerns

In special cases, the following specific operating procedures shall be utilized:

Pool	Special Circumstance	Action Required
Maple Lake (47-091-00035) (47-091-00036) (47-091-00037)	2 storage horizons; must shut-in 3 Big Injun wells (606151, 606152 and 606153) mid-injection season, at pressure of 553 psig	Monitor pool inventory; shut-in back 3 before total pool inventory = 1.57 Bcf
Hunters Cave: 603725 (37-059-20012) Tepe: 603839 (37-059-20894)	Withdrawal-only wells, located within buffer zone (between active and protective boundaries)	Storage will notify Operations when to open and close these wells.

Swarts and Hunters Cave (both fields): During the CONSOL mine-through, safety incidents or abnormal operating conditions that may impact the safety of the mining operations need to be reported to both CONSOL and PADEP as soon as possible. Contact information is:

CONSOL Tracking Center: (724) 663-7501 or (724) 249-7065
PADEP Southwest Regional Office: (412) 442-4000

F. REPORTING AND RECORD-KEEPING

1. Reporting

PA Oil and Gas Act 13, Subchapter C, Underground Gas Storage, Section 3231, Reporting requirements for gas storage operations;
PHMSA Interim Final Ruling

Storage submits pool maps to the Pennsylvania and West Virginia DEP, as required. PHMSA requires an Annual Storage report to be filed for each storage field.

2. Control Room Communication

API 1171 11.7

All communication related to system changes that storage operations wants to be carried out must go through either the Gas Control Manager, Supervisors, or the On-call Person.

3. Management of Change

API 1171 11.11

Changes that affect the operation of any storage field will be subject to the EQT Midstream integrity management policy regarding Management of Change (MOC). Capital improvement projects that affect one or more wells will require project management oversite to monitor the scope of the project and commence MOC procedures if the scope changes.

4. Record-keeping

PA Code, Subchapter H, Underground Gas Storage, Section 78.406, Recordkeeping;
API 1171 9.8, 11.13

Storage maintains monthly storage well inspection reports, biannual shut-in test data, surveillance logging reports, PA plugged and abandoned well inspection reports, and well completion data as available, including well pockets, well logs, well cards, etc… Retention for records relating the design and condition of the well are required to be retained for the life of the well. PA requires well inspection results and pressure data to be held for 7 years, well integrity testing data held for 15 years and data gathered during the plugged and abandoned well inspections held for 7 years.

G. API RP 1171/Integrity Plan Cross-reference table

AP RP 1171	Requirement	PA	WV	Integrity Plan Description	Page #
5.2.2	Geologic Characterization			Geologic Characterization	11
5.3.2	Engineering Characterization			Reservoir modelling	11
5.3.2	Engineering Characterization	✓		Well Performance Testing	11
5.4.3. 5.4.7	Maximum and Minimum Pressure, Facility Integrity Plan	✓		Operating parameters	13-15
5.5	EHS design considerations			Environmental, Health and Safety	12
6.2	Wellhead Equipment Design	✓		Wellhead Equipment	11
6.3	Well Casing	✓	✓	Casing and Cementing	11
6.4	Casing Cementing Practices	✓	✓	Casing and Cementing	11
6.6	Well Remediation	✓		Other Storage Well Work	10-11
6.7	Well Closure	✓	✓	Plugging and Abandoning Wells	11
6.8	EHS	✓	✓	Environmental, Health and Safety	12
6.9	Mechanical Integrity Tests	✓		Other Storage Well Work	10-11
6.10	Monitoring of Construction Activities			Other Storage Well Work	10-11
8	Risk Management for Gas Storage Operations			Risk Assessment/Risk Mitigation	12
9.3.2, 10.5	Well Integrity Monitoring, Site Inspections	✓	✓	Monthly well inspections	7-8
9.3.2	Well Integrity Monitoring	✓		Annual Inspections of Plugged and Abandon wells	8
9.3.2	Well Integrity Monitoring	✓		Casing Corrosion Inhibitor	10
9.3.2	Well Integrity Monitoring	✓	✓	Valve Maintenance	10
9.3.2	Well Integrity Monitoring	✓		Surveillance Logging	12
9.4.3	Third Party Activity	✓		Non-storage wells	13
9.4.3	Third Party Activity	✓		Outside Drilling	13
9.4.4, 9.5.3	Observation wells, Hydrocarbon Reservoir Methodology	✓		Monitoring of monthly pressures	12
9.5.3	Hydrocarbon Reservoir Methodology	✓		Use of Remote Terminal Units for Pressure Monitoring	9
9.5.5	Hydrocarbon Reservoir Methodology additional actions	✓		Spring and Fall Shut-in Tests	8-9

9.6	Flow and Pressure Monitoring			Monitoring of monthly pressures	12
9.7	Integrity Non-conformance			Monitoring of monthly pressures	12
5.6, 6.11, 8.8, 9.8, 11.13	Record Keeping	✓		Record Keeping	15
10.2.1	General Site Security and Safety			Safety Practices	7
10.2.2	Site Security and Safety			Well Security	10
10.3.1	Ingress and Egress: Roads			Well Access	10
10.4	Signage	✓	✓	Monthly well inspections	7-8
10.5	Site Inspections	✓	✓	Monthly well inspections	7-8
10.6.1	Emergency Preparedness/Emergency Response Plan	✓		Emergency Response Plans	11
10.6.2, 11.12	Training			Training	7
10.7	Cyber Security			only impacts pipelines	n/a
11.7.2	Interaction with Control Room			Control Room Communication	15
11.11	Management of Change			Management of Change	15