



Ohio Department of Natural Resources

MIKE DEWINE, GOVERNOR

MARY MERTZ, DIRECTOR

Eric Vendel, Chief

Division of Oil and Gas Resources Management

2045 Morse Rd, Building F

Columbus, Ohio 43229

Phone: (614) 265-6922; Fax: (614) 265-6910

ORDER BY THE CHIEF

June 26, 2023

ORDER NO. 2023-139

**TO: K & H Partners LLC
283333 West Belpre Pike
Coolville, OH 45723**

**RE: K & H Partners LLC No. 1 Well
API # 34-009-2-3821-00-00
SWIW No. 8
Troy Township, Athens County**

**K & H Partners LLC No. 2 Well
API # 34-009-2-3823-00-00
SWIW No. 10
Troy Township, Athens County**

**K & H No. 3 Well
API # 34-009-2-3824-00-00
SWIW No. 11
Troy Township, Athens County**

SUBJECT: Suspension of Injection Operations

Pursuant to Ohio Revised Code Section 1509.03 and Ohio Admin. Code 1501:9-3-07(N), the Chief of the Division of Oil and Gas Resources Management (“Chief” or “Division”) makes the following Findings and issues the following Order:

BACKGROUND:

- (1) K & H Partners LLC (“K & H”) is the “Class II disposal well owner,” as that term is defined in Ohio Admin. Code 1501:9-3-01(J), of the K & H Partners No. 1 Well, API# 34-009-2-3821-00-00, SWIW No. 8 (“K&H No. 1”); the K & H Partners LLC No. 2 Well, API 34-009-2-3823-00-00, SWIW No. 10 (“K&H No. 2”); and the K & H No. 3 Well, API# 34-

009-2-3824-0000, SWIW #11(K&H No. 3) located in Troy Township, Athens County, Ohio (collectively referred to as “the K&H Injection Wells”).

- (2) Pursuant to R.C. 1509.05, R.C. 1509.06, and R.C. 1509.22(D), on November 13, 2012, December 9, 2013, and March 18, 2015, the Division issued permits to K & H, authorizing K & H to drill the K& H Partners LLC No. 1 Well, K & H Partners LLC No. 2 Well, and K & H No. 3 Well as saltwater injection wells.
- (3) The K& H Partners LLC No. 1 Well is constructed to inject into Devonian-aged shale formations at a depth interval of 1904 feet to 3960 feet.
- (4) The K& H Partners LLC No. 2 Well is constructed to inject into Devonian-aged shale formations at a depth interval of 2020 feet to 3990 feet.
- (5) The K& H No. 3 Well is constructed to inject into the Devonian-aged shale formations at a depth interval of 2071 feet to 4010 feet.
- (6) The K&H injection wells have “ratholes,” which are portions of the borehole that extend 25 to 45 feet below the permitted injection zone, close to the estimated top of the Oriskany Sandstone.
- (7) On May 20, 2019, in response to information received by the Division indicating that production wells may be impacted by the K&H Injection Wells, a Division inspector met with the owner of the S. Moore No. 1 Well, API# 34-009-2-3537-0000, who reported brine at surface and loss of production. The owner reported that the S. Moore No. 1 flowed 100 barrels of brine in 90 minutes until it was shut in. The S. Moore No. 1 was drilled in September 1993 to produce from the Devonian-aged Oriskany Sandstone formation at a depth interval of 4095 feet to 4111 feet and is located approximately three quarters of a mile east of the K&H Injection Wells. The Oriskany Sandstone is stratigraphically deeper than permitted injection zones for the K & H injection wells.
- (8) The Division conducted subsequent inspections of the S. Moore No. 1 Well on September 17, 2020, and July 27, 2021. During those inspections, the inspector measured increasing pressure on the production casing annulus and production tubing annulus.
- (9) On September 17, 2020, in response to information received by the Division indicating that production wells may be impacted by the K&H injection wells, a Division inspector met with the owner of the H. Dunfee No. 1 Well, API# 34-009-2-3538-0000, to discuss brine at surface and loss of production at the well. The H. Dunfee No. 1 Well was drilled in November 1993 to produce from the Devonian-aged Oriskany Sandstone formation at a depth interval of 4080 feet to 4097 feet and is located about one mile east of the K&H

Injection Wells. During the inspection, the Division inspector measured the pressure on the production casing annulus.

- (10) The Division conducted a subsequent inspection of the H. Dunfee No. 1 Well on July 27, 2021. During that inspection, the inspector measured increasing pressure on the production casing annulus.
- (11) On March 8, 2021, again in response to information received by the Division indicating that production wells may be impacted by the K&H injection wells, a Division inspector met with the owner of the R. Dunfee Unit No. 1 Well, API# 34-167-2-9029-0000, to discuss loss of production and brine at surface. The owner demonstrated the well flowing brine to surface during the inspection. The R. Dunfee Unit No. 1 Well was drilled in November 1993 to produce from the Devonian-aged Oriskany Sandstone formation at a depth interval of 4024 feet to 4039 feet. It is located approximately 1.5 miles east of the K&H injection wells.
- (12) The brine flows and pressure increases described above do not occur naturally in Devonian-aged Oriskany Sandstone wells drilled decades ago and can only be originating from a nearby injection well or wells as depicted in the attached Exhibit A.
- (13) The Division previously investigated allegations that injection wells were impacting the S. Moore No. 1, the H. Dunfee No. 1, and the Holdren-Dunfee Unit No. 1, API No. 34-009-2-3582-0000, and concluded in or around 2016 that it was unlikely the K&H No. 3 was impacting these wells. Subsequent developments including, but not limited to the following, undermine that 2016 investigation and demonstrate that its conclusion is wrong.
 - (a) The brine flows and pressure increases described above were not present during the 2016 investigation and cannot be explained by a natural production decline.
 - (b) In 2019, the Division received a report from an expert petroleum engineer it retained as part of its investigation of allegations that an injection well in Washington County, the Redbird No. 4, was impacting production wells as far as five miles away. That report is available at <https://ohiodnr.gov/discover-and-learn/safety-conservation/about-odnr/oil-gas/oil-gas-resources/washington-county-investigation>. That report concluded that injection pressures were allowing natural fractures to be increased in size or propagated in the Ohio shale injection zone. The fractures allowed injected brine to travel far beyond the area of review and upwards of at least 1800 feet from the point of injection, which is outside of the permitted injection zone and area of review. Before receiving the Redbird report, the Division did not contemplate that injected fluid could migrate in the manner described by that report.

- (c) The K&H Wells have injected large volumes of fluid at pressures that have increased.
 - (d) The Division has learned through step rate testing of other shale injection zones that the formula used to calculate the maximum allowable injection pressure for the K&H Injection Wells may result in a maximum allowable injection pressure that is high enough to allow for the creation and propagation of fractures in the injection zone.
- (14) Data provided to the Division, including injection pressure and bottom hole pressure data, for the K&H Injection Wells does not establish that these wells are not communicating with each other. Even assuming that there is no communication, it does not establish that the K&H Injection Wells are not impacting production wells or that fluid is not traveling out of the area of review because injected fluid is not necessarily travelling radially. The known impacts of the K&H Wells and information contained in the June 2, 2020 technical analysis prepared by ALL Consulting suggest that fluid is not reaching radial flow and is flowing through fractures.
- (15) Zone of influence calculations performed during the previous investigation used data for the Oriskany Sandstone because that is the formation from which potentially impacted wells were producing. Zone of influence calculations assume radial flow. The fluid injected into the K&H Injection Wells is likely not reaching radial flow because the reservoir is fractured. Therefore, the previous zone of influence calculations can no longer be reliably used to conclude that the K&H Injection Wells are not impacting production wells.
- (16) Decreases in the amount of reported produced brine from the impacted production wells cannot be used to conclude that they are not being impacted. The impacted production wells were shut-in after being impacted and, therefore, would not produce anything, including brine.
- (17) The impacts described above cannot be plausibly explained as naturally originating from the Big Injun Sandstone. The weight of the brine found in the S. Moore No. 1 is dissimilar from the weight of native brine from the Big Injun as reported in the June 2, 2020 technical analysis prepared by ALL Consulting. The construction of the impacted wells undermines the possibility that brine in these production wells is coming from the Big Injun because their cemented steel casing is a barrier between the wells and the Big Injun to isolate them from the Big Injun. In addition, if the Big Injun is the source of the brine in the impacted wells, it is unlikely that impacts in all three wells would only be observed after the K&H Injection Wells began operating.

- (18) During the time frame in which the complaints described above were received, the only nearby injection wells that injected brine at volumes large enough to migrate to the impacted production wells are the K& H Injection Wells.
- (19) The impacts to production wells extend outside the areas of review for the K& H Injection Wells.
- (20) Ohio Administrative Code 1501:9-1-07(A) provides that “[a]ll persons engaged in any phase of operation of any well or wells shall conduct such operation or operations in a manner which will not contaminate or pollute the surface of the land, or water on the surface[.]”
- (21) Ohio Administrative Code 1501:9-3-07(N)(1) states, in pertinent part, that “[t]he chief may immediately suspend, by order, operations of a class II disposal well or surface facility under any of the following circumstances:
 - (a) A class II disposal well is causing or likely to cause contamination of the land, surface waters, or subsurface waters; * * *
 - (f) The chief determines that operation or continued operation of the well . . . is likely to endanger public health or safety;
 - (g) The chief determines that brine or other waste substances from class II disposal well injection operations may be outside of the permitted injection zone or area of review; [and] * * *
 - (k) Any violation of Chapter 1509. of the Revised Code or division 1501:9 of the Administrative Code.”
- (22) Pursuant to R.C. 1509.03 and Ohio Admin. Code 1501:9-3-07(N), Chief's Order No. 2023-122 was issued to K&H on June 2, 2023, finding that K&H's operations of the K&H Injection Wells violate Ohio Admin. Code 1501:9-1-07(A); is impacting nearby production wells and that such impacts endanger and are likely to endanger public health, safety, or the environment; that the continued operation of the K&H Injection wells may cause additional impacts in the future that are likely to contaminate the land, surface waters, or subsurface waters; that the continued operation of the K&H Injection Wells presents an imminent danger to the health and safety of the public and is likely to result in immediate substantial damage to the natural resources of the state; that brine or other waste substances from operation of the K&H Injection Wells are outside of the area of review; and that the K&H Injection Wells should be immediately suspended under Ohio Admin. Code 1501:9-3-07(N).
- (23) On June 14, 2023, K&H requested an informal hearing on Chief's Order 2023-122.

- (24) Pursuant to R.C. 1509.224(B), on June 16, 2023, an informal hearing was held before the Division to provide K&H with an opportunity to present evidence as to why Chief's Order 2023-122 should be revoked or modified. K&H made a presentation during that hearing, which the Division has considered.
- (25) Pursuant to R.C. 1509.224(B), this order is issued as a final Order modifying Chief's Order 2022-122.

FINDINGS:

- (1) The Chief finds that K&H's operations of the K&H Injection Wells violate Ohio Admin. Code 1501:9-1-07(A).
- (2) The Chief finds that the operation of the K&H Injection Wells has and is impacting nearby production wells and that such impacts endanger and are likely to endanger public health, safety, or the environment.
- (3) The Chief finds that if the K&H Injection Wells continue to operate, additional impacts may occur in the future and are likely to contaminate the land, surface waters, or subsurface waters. Thus, the continued operation of the K&H Injection Wells presents an imminent danger to the health and safety of the public and is likely to result in immediate substantial damage to the natural resources of the state.
- (4) The Chief finds that brine or other waste substances from operation of the K&H Injection Wells are outside of the area of review.
- (5) The Chief finds that the K&H Injection Wells should be immediately suspended under Ohio Admin. Code 1501:9-3-07(N).

ORDERS:

IT IS HEREBY ORDERED:

- (1) K&H shall immediately suspend all operations at the K&H Injection Wells and associated surface facility.
- (2) K&H shall submit a plan in accordance with Ohio Admin. Code 1501:9-3-07(O)(1).
- (3) Injection operations at the K&H Injection Wells shall not resume until the Chief or his authorized representative determines that the conditions that caused the suspensions have been corrected and this Order is terminated.

6/26/2023
Date

Andrew Adgate For
Eric Vendel, Chief
Division of Oil and Gas Resources Management

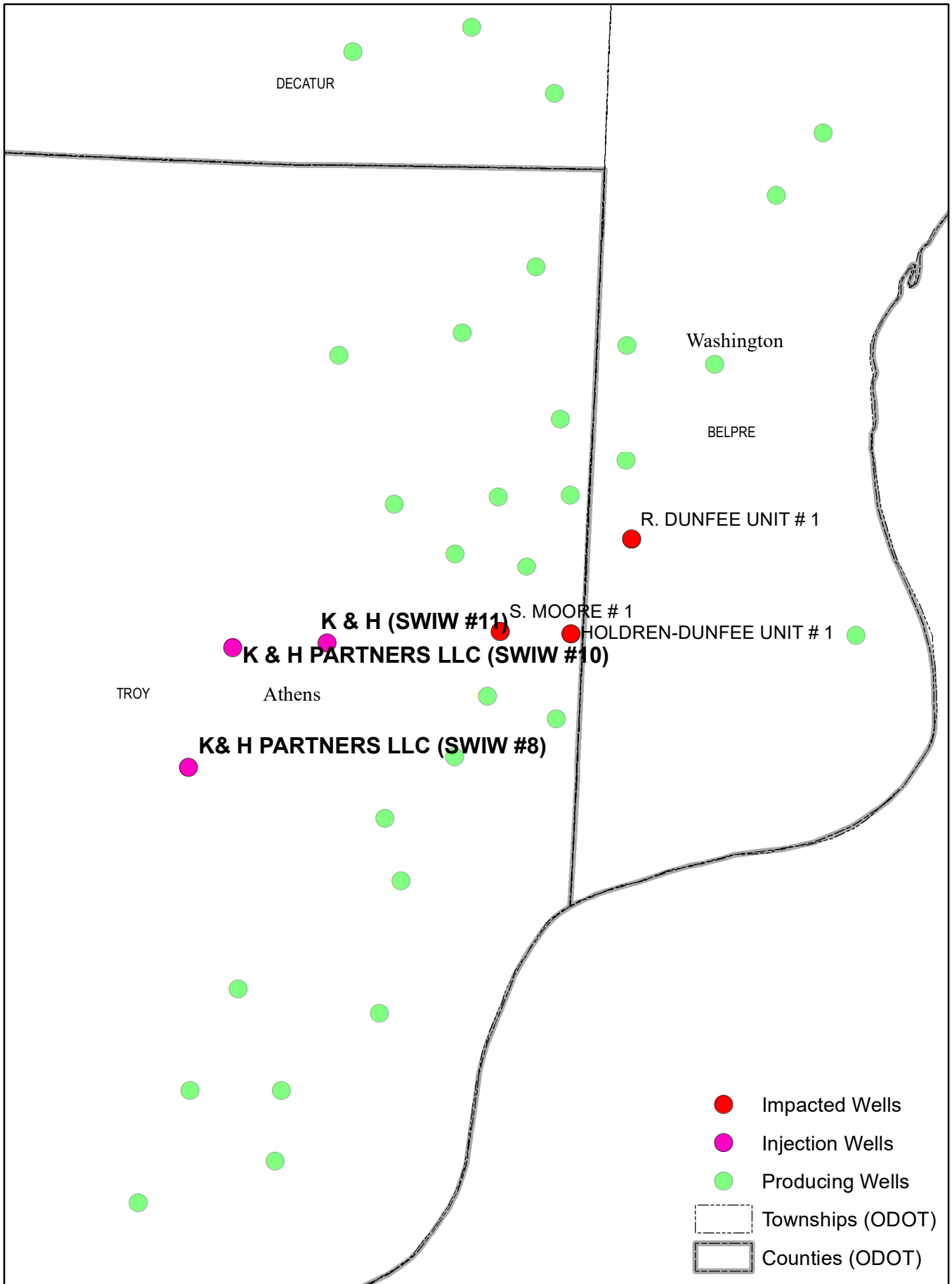
Addressee is hereby notified that this action is final and effective and may be appealed pursuant to R.C. 1509.36 of the Ohio Revised Code. If the Order is appealed to the Ohio Oil and Gas Commission, the appeal must be in writing and must set forth the Orders complained of and the grounds upon which the appeal is based. Such appeal must be filed with the Oil and Gas Commission, 2045 Morse Road, Building E-1, Office 103, Columbus, Ohio within 30 days after the date upon which the person to whom the order was issued receives the Order and, for all other persons adversely affected by the Order, within 30 days after the date of the Order.

In addition, within three days after the appeal is filed with the Oil and Gas Commission, notice of the filing must be submitted to Eric Vendel, Chief, Division of Oil and Gas Resources Management, Ohio Department of Natural Resources, 2045 Morse Road, Building F, Columbus, Ohio 43229-6693.

CERTIFIED MAIL No: 9489009000276354902836

Enclosure:
Exhibit A

EXHIBIT A



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0 0.375 0.75 1.5 Miles



June 30, 2023

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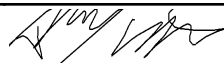
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Extra Services:	Certified Mail™ Return Receipt Electronic

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Recipient Signature

Signature of Recipient:



Jeremy Vincenzi

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