July 19, 2026

FACT SHEET

The U.S. Environmental Protection Agency (EPA) is proposing to approve reissuance of an exemption to the land disposal restrictions for the following injection well facility:

Applicant:	The Dow Chemical Company 310 George Patterson Blvd., Suite 100 Bristol, Pennsylvania 19007
Facility Location:	The Dow Chemical Company c/o Albemarle Corporation West Plant Highway 371 South Magnolia, Arkansas 71753
Well:	DWD No. 1
Issuing Office:	U.S. Environmental Protection Agency Region 6 (6WQ-SG) Renaissance Tower 1201 Elm Street Suite 500 Dallas, Texas 75270-2733

Summary of Decisional Basis

The EPA land disposal restrictions promulgated under Section 3004 of the Resource Conservation and Recovery Act ("RCRA") prohibit the injection of restricted hazardous waste unless a petitioner demonstrates to the EPA that there will be no migration of hazardous constituents from the injection zone for as long as the waste remains hazardous. These no migration demonstrations must meet the regulatory standards promulgated in Title 40 of the Code of Federal Regulations, Part 148, Subpart C (40 C.F.R. Section 148, Subpart C). The demonstration includes a description of the well operations, geologic siting, and waste stream characteristics. The demonstration also includes modeling strategies which incorporate all the previously mentioned information and utilize mathematical equations to predict pressure buildup and waste movement. A method of land disposal may not be determined to be protective, "unless, upon application by an interested person, it has been demonstrated to the Administrator, to a reasonable degree of certainty, that there will be no migration of hazardous constituents from the disposal unit or injection zone for as long as the wastes remain hazardous" (42 U.S.C. Section 6924(g)(5)). Under the Hazardous Waste Disposal Injection Restrictions (HWDIR) regulations promulgated by the EPA, 40 C.F.R. Section 148, 53 Fed. Reg. 28118 (July 26, 1988), the continued injection of any waste identified as a "hazardous waste" under the EPA's RCRA regulations would be prohibited unless the EPA approves a petition demonstrating, to a reasonable degree of

certainty, that continued waste injection will be protective of human health and the environment for as long as the waste remains hazardous.

Section 148.20(a)(1)(i) of the regulations provides that such a demonstration may be made on the basis of a scientific analysis showing that the injected fluids will not migrate vertically upward out of the injection zone or laterally within the injection zone to a point of discharge or interface with an Underground Source of Drinking Water (USDW) within 10,000 years.

Dow Chemical Company successfully demonstrated no migration for its Class I hazardous waste injection well, DWD No. 1, at the Albermarle Corporation West plant located in Magnolia, Arkansas, and received a petition issuance on September 22, 2010, with a cessation date of October 1, 2020.

Dow Chemical Company submitted a petition reissuance requesting one revision to the currently approved 2010 reissuance: an extension of the operational life of DWD No. 1 to January 1, 2029. The following explains the derivation of the proposed decision, categorized according to the criteria outlined in 40 C.F.R. Part 148 [53 Fed. Reg., 28118 (7/26/88)].

The Dow petition reissuance described the operation of DWD No. 1 through a discussion of well construction, injection pressures, and injection volumes. The site location and geologic conditions were presented through a discussion of the depositional environments, well logs, cross-sections, well tests, geologic maps, and well records. The characteristics of the waste stream were described and evaluated for compatibility with the injection and confining zones. Dow incorporated all this information into a modeling strategy which predicted the pressure buildup and waste movement for the Albemarle site. Note that no faults were included in the model since there are none in the Area of Review (AoR).

The AoR is the region around the injection wells that is investigated for possible conduits for flow. For Class I hazardous waste injection wells, the AoR has at least a 2-mile radius around the injection wells and includes the Zone of Endangering Influence (ZEI) from the pressure modeling and the hazardous waste plume from the plume modeling. The pressure modeling indicated that the ZEI is contained within the 2-mile minimum radius, but the plume modeling extends the AoR an additional 0.73 miles in the northeast direction. All penetrations in this extended area were reviewed to ensure that the injected waste will remain in the approved injection zone, and that the injection of waste will not endanger the USDWs.

To ensure that the injected waste will remain in the approved injection zone, vertical migration through the containment interval of the injection zone was also analyzed for waste permeation and diffusion. This analysis concluded that the maximum vertical waste movement would be contained in 180.77 feet (ft) of 1260 ft for the James injection interval and 181.45 ft of 710 ft for the Tokio injection interval. Lastly, the confining zone is the impermeable layer overlying the injection zone that provides an additional layer of protection from upward migration of waste, which at this site, is the 70-foot shale unit of the Lower Nacatoch Formation.

In addition to the reasonably conservative data and assumptions used in the no migration petition reissuance, the demonstration is even more conservative as it excludes degradation of the hazardous constituents in the injection zone. Hydrolysis and chemical fate are examples of degradation which were not considered in the no migration demonstration. Therefore, after a detailed and thorough review of Dow's petition for reissuance of the exemption, the EPA proposes that Dow has demonstrated, to a reasonable degree of certainty, that there will be no migration of hazardous constituents from the injection zone for as long as the waste remains hazardous (or 10,000 years, as defined by 40 C.F.R. Section 148.20). Dow also submitted a signed certification statement on June 17, 2026, from an authorized representative verifying that all submitted materials are true, accurate, and complete, pursuant to 40 C.F.R. Section 148.22(a)(4).

The factors considered in the formulation of this proposed petition decision are described below.

Geology and Hydrogeology

The geologic conditions at the Albemarle West Plant were presented within the petition and included discussions of depositional environments, well logs, stratigraphic cross-sections, well tests, core data, and geologic maps. The petitioner provided sufficient site-specific information to support the demonstration of the thickness, porosity, permeability, extent, and lateral continuity of the injection and confining zones. An evaluation of the local and regional geology determined that the Albemarle West Plant is located at a geologically suitable site that meets the requirements of 40 C.F.R. Part 148.

Approximate depths to the tops of the geologic zones are as follows:

Geologic Zone	Formation	DWD No.1 (feet)
Base of USDW	Wilcox	1305
Confining Zone		2110 – 2180
Injection Zone		2180 – 4510
Injection Interval:	Tokio Sandstone	2890 – 3080
	James Limestone	4340 – 4510
Total Depth of Well		4600

(DWD No. 1 depths referenced to 4/11/2006 High Resolution Induction Spectral Density Dual Spaced Neutron Log using Kelly Bushing (KB) depths in feet).

Geochemistry and Injected Waste Compatibility

The physical and chemical characteristics of the injection zone and the formation fluids were described within the petition. The characteristics of the waste stream were described and evaluated for compatibility with the injection and confining zones. The information provided within the petition describes the geochemical conditions of the site that meet the requirements of 40 C.F.R. Section

148.21(b)(5).

Modeling Strategy

Site geology and other associated details have changed little since the 2010 issuance, and the 2010 fact sheet summarizing area geologic detail is attached. The site is operated by Dow Chemical Company, as was previously stated in the referenced 2010 fact sheet. Revised reissuance condition requests coupled with an additional 10 years of previous injection rate history, monitoring data, and annual testing results resulted in updated pressure buildup and long-term plume models being run for both of the injection intervals. Dow ran the EPA verified and validated SWIFT model, a flow and transport model, to characterize the extent of their injected waste plume and the associated pressure buildup.

Dow incorporated two timeframes, the operational and post-operational periods, to complete the modeling demonstration for the petition reissuance request. The operational period included all historical injection data from start of injection until year end 2018 and the maximum future injection volumes starting from the end of historical injection through January 1, 2029, to over-predict the maximum pressure buildup and the maximum initial waste plume in each injection interval. The 10,000-year post injection period was modeled to predict the maximum vertical molecular diffusion and the horizontal drift of the waste plumes. Both the pressure buildup and plume migration models used the maximum requested injection rate of 100 gpm for each injection interval from January 1, 2019, through January 1, 2029, to project the maximum pressure buildup and migration of the plume. The pressure buildup and plume migration model demonstrations for the individual layers for the James Limestone and Tokio Sandstone used conservative reservoir pressures compared to historical static and flowing pressure measurements obtained from falloff tests conducted in DWD No. 1 for the James Limestone injection interval.

In demonstrating no migration of hazardous waste, predictive models must be validated, and be appropriate for the specific site, waste streams, and injection operating conditions, and must be calibrated when sufficient data are available, 40 C.F.R. Section 148.21(a)(3). The modeling strategy for Dow's no migration demonstration consisted of a combination of numerical and analytical models. This information consisted of actual model documentation or references of methods or techniques that are widely accepted by the technical community. The petition reissuance document described the predictive models used and demonstrated the above criteria are met.

To determine appropriate values to be used in the no migration demonstration, Dow reviewed site specific data acquired during the drilling of DWD No.1, annual well testing, and mechanical integrity tests. Dow also reviewed offset well information and applicable literature. Appropriate estimation techniques and testing protocols were used in accordance with 40 C.F.R. Section 148.21(a)(2). A range was assigned to some parameters to maximize their impact on the demonstration. For example, higher permeabilities were assigned to maximize the lateral waste plume movement while lower permeabilities were assigned to maximize the predicted pressure buildup in the James and Tokio injection intervals. Nearby offset Class I injection wells were considered in the pressure buildup demonstration. Additionally, there are no known hydrocarbon production from the Tokio or James Injection Intervals

within the light or heavy plume areas, or within at least a 5-mile radius of the Dow injection well.

Whenever values are taken from literature or estimated based on known information, instead of site-specific measurements, reasonably conservative values must be used, 40 C.F.R. Section 148.21(a)(5). Many variables were required to be quantified to use the petition's models. All parameters were conservatively assigned to produce worst case conditions for pressure buildup and waste movement.

Additionally, 40 C.F.R. Section 148.21(a)(6) requires a petitioner to perform a sensitivity analysis to determine the effect of uncertainties associated with model parameters. Dow's sensitivity analysis determined that four parameters, dispersivity, viscosity, porosity, and permeability, will have the greatest impact on the model. There is no significant uncertainty associated with the model input values for these four parameters that would affect the conservatism of the model. Through conservative model parameter assignments within this analysis, worst case scenarios for pressure buildup and waste movement were investigated and reported.

The Area of Review (AOR) is defined as a fixed radius surrounding the injection well(s) and Zone of Endangering Influence (ZEI) (40 C.F.R. Section 146.6). The AOR for Class I hazardous waste wells must be a minimum of a 2.0-mile radius around the well bore (40 C.F.R. Section 146.63). Dow submitted information on all artificial penetrations within a composite 2.0-mile radius around the injection well. The ZEI is the area in which the pressures in the injection zone may cause the migration of the injection and/or formation fluid into an underground source of drinking water as per 40 C.F.R. Section 146.6(a)(1)(ii). The threshold pressure increase for is 143 psi for James Limestone and 166 psi for the Tokio Sandstone. The ZEI for both injection intervals is contained within the 2.0-mile AOR.

The pressure buildup demonstration used lower transmissibility values to over-predict well pressures in comparison to historical static and flowing pressure measurements obtained from falloff tests conducted in DWD No. 1. The maximum future injection rates were then injected following the historical injection to maximize the predicted pressure buildup in the reservoir. The maximum pressure buildups at DWD No. 1 do not exceed 698 psi within the James Limestone and 702 psi within the Tokio Sandstone.

The Flow and Transport models for Dow Chemical Company's Albemarle West Plant conservatively modeled waste fluid injections into the subsurface under certain modified conditions. Geologic parameters were validated by over-matching model pressure predictions, flowing downhole pressures, and formation shut-in pressures in the injection intervals. Modeling results through January 1st, 2029, using maximum projected injection rates, results in the maximum horizontal extent of the waste in the James Limestone injection interval. The operational plume exceeds the 2.0-mile minimum Area of Review in the north and northeast directions. Waste density effects were also considered in the petition model demonstration. The density of the injectate is approximately 61 lb/ft^3 whereas the density of the formation fluid is 68 lb/ft^3 for the James and 65 lb/ft^3 for the Tokio. Both the James and Tokio have a higher density than the injectate which leads to gradual, density-driven upward movement.

A conservative 10,000-year plume demonstration was constructed using worst-case reservoir characteristics for the James and Tokio injection intervals to project the maximum movement of both the low and high density waste plumes. To maximize plume movement, these demonstrations included thinner net thickness, all historical and maximum future injection volumes, and higher transmissibility values based on historical pressure transient test results from DWD No.1 and area injection wells. A background gradient of 0 ft/yr was assumed in the model for both the low-density and high-density plumes to maximize the modeled up-dip and down-dip plume movement. The high-density plumes in both the James and Tokio models are lighter than the native formation fluids in those Injection Intervals. The James interval does not outcrop on account of the unconformity between the upper and lower Cretaceous strata, and as a result has no evident source for recharge. The Tokio Interval does outcrop some 60 miles northwest DWD No.1 in the up-dip direction. However, there is also no clear discharge point for the down-dip extent of both the James and Tokio intervals. The composite of these plume extents was used to conservatively construct the AOR. Additionally, a limiting concentration reduction factor was set to 1×10^{-7} for the constituents of concern, encompassing the requested EPA hazardous waste numbers included in this reissuance and lower formation fluid viscosity to maximize plume movement.

A vertical diffusion demonstration was included in this petition for reissuance request that calculated the maximum vertical movement into intact strata and a mud-filled wellbore. As pressure decreases within the formation, vertical permeation will decrease, resulting in the residual vertical permeation value in the aquiclude layer above the James Limestone will not exceed 0.07 feet. The vertical permeation value in the aquiclude layer above the Tokio Sandstone will not exceed 0.75 feet. The most mobile injected waste constituent will not move vertically beyond 180.77 feet of the 1260 feet of Glen Rose and Shale formations between the James and Tokio injection intervals. The waste will also not move vertically past 181.45 feet within the 710 feet of scattered chalk and marl formations above the Tokio Sandstone injection interval. The demonstrations (lateral plume and diffusion) demonstrated that the injected waste stream for each interval will not migrate vertically upward out of the injection zone or laterally within the injection zones to a point of discharge or interface with a USDW for the required 10,000-year demonstration period. The model predicts no vertical permeation of fluids out of the Injection Zone.

Artificial Penetrations

Dow submitted updated information on all 47 artificial penetrations (wells) which either penetrated the injection or confining zones within the 2.0-mile area of review or the 10,000-year waste plume boundary. All of these wells were evaluated and are plugged or constructed so that no waste would migrate from the injection zone due to pressure, buoyancy, or molecular diffusion in an artificial penetration. *See* 40 C.F.R. Sections 148.20(a)(1) & (2)(i)-(iii).

Mechanical Integrity Testing Information

To ensure that the wastes will reach the injection interval, a petitioner must submit the results of

pressure and radioactive tracer tests. 40 C.F.R. Section 148.20(a)(2)(iv). These tests demonstrate mechanical integrity of a well's long string casing, injection tubing, annular seal, and bottom hole cement. The tests confirm that all injected fluids are entering the approved injection interval and that no fluids are channeling up the wellbore out of the injection zone near the wellbore. This petition for reissuance request demonstrates that Dow's disposal wells were tested and satisfy the above criteria:

Well	DWD No.1
Annulus Pressure Test	7/9/2025
Radioactive Tracer Survey	7/9/2025
Pressure Fall-off Test	7/9/2025
Differential Temperature Survey	*9/9/2022

* The Differential Temperature Survey is a five-year testing requirement, *see* 40 C.F.R. Section 146.68(d)(3), whereas the Annulus Pressure Test, Radioactive Tracer Survey, and Pressure Fall-off Test are required annually, *see* 40 C.F.R. Section 148.20(a)(2)(iv) and 40 C.F.R. Section 146.68(e)(1).

Quality Assurance

The Dow petition must demonstrate that proper quality assurance and quality control plans were followed in preparing the petition demonstrations, as required by 40 C.F.R. Section 148.21(a)(4). Specifically, Dow followed appropriate protocol in identifying and locating records for artificial penetrations within the area of review (AOR). Information regarding geology, waste characterization (40 C.F.R. Section 148.21(a)(1)), hydrogeology, reservoir modeling, and well construction was adequately verified or bounded by worst-case scenarios within the no migration petition reissuance demonstration.

Characteristics of Injected Fluids

The petition included identification of the specific waste(s) and the specific injection well and waste analysis to describe the chemical and physical characteristics of the waste to meet the requirements of 40 C.F.R. Section 148.22(a) and 40 C.F.R. Section 148.21(a)(1). Dow currently uses their Class I injection well (DWD No. 1) to dispose of recovered groundwater from its acreage and surrounding areas on the Albemarle facility. In addition, the well could inject non-hazardous wastewater from the Albemarle bromine extraction facility. The following list characterizes individual waste streams that are permitted and may contribute to the composite stream to be injected:

A. Wastes generated during closure of the well and associated facilities that are compatible with permitted wastes, reservoir, and the well.
B. Groundwater from French drain systems and/or shallow recovery wells.
C. Boilerhouse blowdown, cooling tower overflow, and no-contact process water.
D. Rainfall from curbed areas and sumps.
E. Product spills and wash water from the management of those spills.

F. Other associated wastes such as groundwater and rainfall contaminated by the above authorized wastes, spills of the above authorized wastes, and wash waters and solutions used in cleaning and servicing the waste disposal well system equipment which are compatible with the permitted waste streams, reservoir, and well materials.

Operational Life:

End of Operational Life: January 1, 2029

Modeled Well Location	**Injection Interval**	**Maximum Incremental Pressure Buildup (psi)**
DWD No. 1	James Limestone	698 psi
DWD No. 1	Tokio Sandstone	702 psi

10,000 Year Post-Injection Period:

Formation	**Plume Type**	**Dip Direction**	**Lateral Plume Extent (Feet/Miles)**
James Limestone	Light Plume	Northeast up dip	14,400 (2.73)
James Limestone	Light Plume	Southwest down dip	5,400 (1.02)
James Limestone	Heavy Plume	Northeast up dip	12,200 (2.31)
James Limestone	Heavy Plume	Southwest down dip	5,200 (0.98)
Tokio Sandstone*	Light Plume	Northeast up dip	8,600 (1.63)
Tokio Sandstone*	Light Plume	Southwest down dip	4,800 (0.90)
Tokio Sandstone*	Heavy Plume	Northeast up dip	5,000 (0.95)
Tokio Sandstone*	Heavy Plume	Southwest down dip	4,400 (0.83)

*****Note that the Tokio Sandstone values are for Model Results only – No active injection has yet to occur in the Tokio Sandstone.

Formation	**Diffusion Medium**	**Vertical Plume Extent (Feet)**
James Limstone	Intact Strata	180.77[2]
James Limestone	Mud Filled Borehole	362[1]
Tokio Sandstone	Intact Strata	181.45[2]
Tokio Sandstone	Mud Filled Borehole	361.6[1]

([1]Vertical diffusion distance through 9.0-lb/gal mud* for Benzene)

([2]Includes 5% uncertainty to account for uncertainty in the free water diffusion coefficient.)

Proposed Petition Reissuance Approval Conditions

This proposed approval of a petition for reissuance of an exemption to allow the injection of restricted hazardous wastes is subject to the following conditions, which are necessary to assure that the standard in 40 C.F.R. Section 148.20(a) is met. Noncompliance with any of these conditions is grounds for termination of the exemption, *see* 40 C.F.R. Section 148.24(a)(1). This proposed exemption applies to the Dow Chemical Company injection well: DWD No. 1, located at its Albemarle Corporation West Plant in Magnolia, Arkansas.

Injection of restricted waste at DWD No. 1 shall be limited to the injection zone in the Tokio Sandstone and James Limestone between 2180 to 4510 feet. The injected waste is limited to the waste codes included in the Proposed Decision Letter. The injected waste volume shall not exceed 100 gallons per minute for a cumulative monthly volume injected into the Tokio Sandstone and James Limestone. The injected waste stream shall conform to the characteristics discussed in the 2019 petition reissuance request document section 6.0 Injection Fluid. If the petitioner wanted to inject additional hazardous waste or increase the concentration of waste, the petitioner would have to submit a reissuance request and/or modifications per 40 C.F.R. Section 148.20(e) or (f).

The Dow Chemical Company, Albemarle Corporation West Plant, shall submit the results of annual bottomhole pressure surveys (40 C.F.R. Section 146.68(e)(1)), for DWD No. 1 to the EPA. In addition, the petitioner shall submit results of pressure and radioactive tracer tests (40 C.F.R. Section 148.20(a)(2)(iv)) and temperature and/or noise logs (40 C.F.R. Section 146.68(d)(4)). The petitioner shall notify the EPA if DWD No. 1 loses mechanical integrity within 24 hours (40 C.F.R. Section 146.67(h)(3)), if any work is planned for the injection well or if the petitioner plans to plug the injection well. The facility shall cease injection into DWD No. 1 by January 1, 2029. Upon the expiration, cancellation, reissuance, or modification of the ADEE UIC permit for DWD No. 1, the petition exemption is subject to review. A new demonstration may be required if information shows that the basis for granting the exemption is no longer valid under 40 C.F.R. Sections 148.23 and 148.24.

The above information provides a summary of the proposed petition approval conditions, to see an extensive list of approval conditions for the petition, please see the Proposed Decision Letter. The list of approval conditions for the petition will also be listed in the Final Decision Letter that will be posted to the Docket following the closure of the public comment period.

In addition to the above conditions, this proposed approval of a petition for reissuance of an exemption is contingent on the validity of the information submitted in the Dow Chemical Company petition reissuance request for an exemption to the land disposal restrictions. Any final reissuance decision is subject to termination when any of the conditions occur which are listed in 40 C.F.R. Section 148.24, including noncompliance, misrepresentation of relevant facts, or a determination that new information

shows that the basis for approval is no longer valid.

Public Comments

The Director shall provide public notice and an opportunity for public comment in accordance with the procedures in 40 C.F.R. Section 124.10 of the intent to approve or deny a petition. The public comment period will run from the date of publication of this notice until 11:59 p.m. Eastern Standard Time (EST) on (September 3rd, 2026). The public is invited to comment on the proposed reissuance decision by:

1) Submitting written comments online at https://www.regulations.gov/docket/EPA-R06-OW-2026-5022 under Docket # EPA-R06-OW-2026-5022.
2) EPA Region 6 encourages the electronic submittal of comments online at https://www.regulations.gov/docket/EPA-R06-OW-2026-5022. If you are unable to submit comments electronically or have any questions or require assistance with submitting comments, please contact Forrest Frederick at frederick.forrest@epa.gov or 214-665-6656.

All comments must be received by the end of the comment period. All comments received before the end of the comment period and at the public hearing will be considered by the EPA in the formulation of any final petition determinations. Comments are given equal consideration regardless of how they are received. Note that comments MUST be submitted to EPA Region 6 using one of the methods above to be considered as part of the permitting decision by EPA Region 6.

The EPA is not required to hold a public hearing; however, if there is sufficient public interest in this proposed decision, the EPA may hold a public hearing. Request for a public hearing must be submitted in writing by email to Forrest Frederick at frederick.forrest@epa.gov or by mail to:

U.S. Environmental Protection Agency
Region 6 (6WQ-SG)
Renaissance Tower
1201 Elm Street
Suite 500
Dallas, Texas 75270-2733

A written request for a public hearing must be submitted before 11:59 p.m. EST on September 3rd, 2026. The EPA will give at least a 30-day notice if a public hearing will be held. Pertinent public comment and public hearing procedures for the EPA may be found in 40 C.F.R. Sections 124.10 and 124.12.

For Further Information

Application materials and other documents related to this action, including this public notice and a fact sheet are available at https://www.regulations.gov/docket/EPA-R06-OW-2026-5022 under Docket #EPA-R6-OW-2026- 5022. Additional information may be obtained at https://www.epa.gov/ar/uic-no-

migration-petition-proposed-reissuance-decision-review-dow-chemical-company-albemarle . The final decision will be published in the Federal Register.