

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III**



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**Responsiveness Summary to Public Comments
for
The Issuance of an Underground Injection Control (UIC) Permit
for
Penneco Environmental Solutions, LLC**

On May 26, 2022, the U.S. Environmental Protection Agency (EPA) Region 3 issued a public notice requesting comments and offering the opportunity for a public hearing for the proposed issuance of an Underground Injection Control (UIC) permit, PAS2702BALL, to Penneco Environmental Solutions, LLC (Penneco). EPA received numerous requests to hold a hearing, and on June 28, 2022, EPA held a virtual public hearing. Sixty-one (61) people attended the public hearing, during which EPA received oral comments from twenty-three (23) people. After several requests for an extension of the public comment period and questions about the virtual format of the May hearing, on July 28, 2022, EPA announced that it would hold a second public hearing as an in-person hearing. The in-person hearing took place on August 30, 2022, at the Plum Borough Community Center where there were approximately fifty-five (55) people in attendance. At this hearing, EPA received oral comments from nineteen (19) people. EPA also extended the period for submitting public comments until September 7, 2022.

The responsiveness summary which follows provides answers to questions and responses to comments raised by ninety-two (92) commenting individuals and entities who either sent a written public comment to the attention of EPA Region 3, and/or who provided comments and asked questions at the two hearings. EPA wishes to thank all the commenters for their informative and thoughtful comments. EPA also would like to thank all Plum Boro representatives who helped to make the Council Chambers accessible for citizens to participate in the Microsoft Teams virtual public hearing. Finally, EPA also wants to thank the individuals at the Plum Borough Community Center who assisted EPA in hosting the in-person public

hearing.

Preliminary Note: Penneco currently owns and operates an injection well in Plum Borough that is referred to as the Sedat #3A well. EPA issued a UIC final permit for this well on March 7, 2018. EPA has made two minor modifications to the permit. With the latest modification, issued on April 28, 2021, EPA increased the amount of fluid Penneco could inject into the well. Penneco is seeking a UIC permit for another UIC well, the Sedat #4A well, that is the subject of this Response to Comments document. The Sedat #4A well would be located about 800 feet from the Sedat #3A well. Penneco currently uses the Sedat #4A well as a gas production well. If Penneco receives all necessary State and Federal approvals, Penneco will convert the Sedat #4A well to an injection well. The wastewater it will inject into the Sedat #4A well will come from production wells owned by Penneco as well as from other oil and gas production wells in the area. (The Sedat #3A well and the Sedat #4A well are hereafter referred to as the “#3A well” and the “#4A well,” respectively.)

COMMENT 1: Issuing an Underground Injection Control (UIC) Permit for the #4A well would violate the Safe Drinking Water Act (SDWA or Act) and the Regulations issued pursuant to the Act.

RESPONSE: The Safe Drinking Water Act requires EPA to develop minimum federal requirements for underground injection of waste fluids. The requirements set out in EPA’s rules mandate practices that protect public health and prevent contamination of Underground Sources of Drinking Water (USDWs – EPA defines USDWs as aquifers supplying any public water system or containing a sufficient quantity of ground water to supply a public water system and containing less than 10,000 milligrams per liter of total dissolved solids.) Unless an injection well is authorized by rule, an owner or operator of an injection well must apply for a permit pursuant to 40 C.F.R. § 144.31.

In the case of Pennsylvania, the Commonwealth never applied for, or assumed primacy for the UIC program. Therefore, the EPA administers the program in the state. As a result, UIC well owners and operators must apply to the EPA to receive a UIC permit.

UIC regulations found at 40 C.F.R. Parts 144 and 146 set the requirements and standards that a permit applicant must meet to receive a permit. (In addition, 40 C.F.R. Subpart NN of Part 147 has additional requirements for UIC wells in Pennsylvania.) These

regulations primarily address the geology of a well site, well engineering, well operation and monitoring, and, finally, well closure. Permit applicants must perform a comprehensive review of the well site and submit the results of the review to EPA. They must provide details about the well's construction, provide specific information about the well's operation, and set out the financial arrangements they have made to ensure the protection of all local USDWs. EPA then reviews each permit application thoroughly to verify its completeness and technical authenticity prior to preparing a draft permit.

Oil and gas production wells produce, as a by-product, large volumes of brine, often referred to as produced water, that also reside in the formations that hold the oil and gas. The #4A well as a gas production well was a source of some brine.

In addition, the fluids used to hydraulic fracture formations holding oil and gas often return to the surface along with materials that are injected to maintain the fractures. With the final permit, Penneco will use the #4A well to the inject the same types of brine and related fluids collected from oil and gas production into a depleted geologic formation which used to produce large quantities of gas and some brine.

Region 3 reviewed Penneco's permit application and related materials and issued a draft permit that in its judgement would comply with the SDWA and the applicable regulations. Region 3 has now reviewed the public comments on the draft permit. In response to the comments, Region 3 modified the requirement for monitoring the Sedat #2A well, which will serve as a monitoring well for the #4A well. As an added safety measure, EPA added the requirement that, if the fluid level in the monitoring well is observed to rise within 100 feet of the base of the USDW, Penneco must stop disposal operations immediately and shall notify the EPA of the situation. Paragraph II.C.4 of the permit.

Also, the Region found that one monitoring requirement was redundant. So, the Region has dropped the requirement that was in Paragraph II.C.2 of the draft permit that Penneco on a daily basis measure the specific gravity of the injected fluid, record the data, and include it in the monthly monitoring information. This same requirement is found in Paragraph II.C.5 of the final permit. A separate requirement in Paragraph II.C.7 of the final permit was edited to correct a typographical error in which the mandatory two-year demonstrations of mechanical integrity were described as "five-year demonstrations" in the previously advertised draft permit. On the basis of its review and with the noted changes, EPA is issuing the final

permit because the permit complies with the SDWA and the regulations authorized by the Act. Further support for this action is set out in the remainder of this Response to Comments document.

COMMENT 2: EPA should deny the permit because conditions at the well site and the surrounding area are substandard for the injection of wastewater.

RESPONSE: Several comments presented variations of the assertion that EPA should not issue the permit because of site and area conditions. One assertion was that thousands of abandoned gas wells in the area would allow the injected fluid to contaminate the groundwater. Another comment was that the #4A well site contains an abandoned gas well next to a coal mine that has been on fire for decades. A third comment questioned the current saturation and ultimate receptivity of the Murrysville Formation. A fourth comment was that there exists the potential for mine subsidence and induced seismicity. A fifth comment was that this region of Pennsylvania does not have geological formations suitable for injection wells because these formations are already in use for gas storage.

In response to the comment about the threat posed by abandoned wells, the Region agrees that without certain precautions, these wells, when they are near an injection well, can pose a risk to USDWs by providing a conduit for the migration of the injected fluid out of an injection zone. (The injection zone is a geologic formation that receives the wastewater pumped from the well.) Therefore, the UIC regulations and a final permit impose certain requirements on an injection well operator to protect USDWs from that risk. One requirement in the regulations specifies that the operator must provide information, including information about any abandoned wells, for a specific area surrounding the well. This specified area is termed the Area of Review or AOR. 40 C.F.R. §§ 144.3 and 146.6.

The AOR can be a fixed radius of not less than one-quarter mile around the injection well or may be a calculated "zone of endangering influence," or "ZEI" around the well. The ZEI calculation is based on specified geologic conditions found in the injection zone as well as proposed operational conditions.

The operator must review all information in the public record, and other information of which it has knowledge, to determine whether any abandoned wells or other potential conduits exist within the AOR that would allow the injected fluid to migrate from the injection zone. If

abandoned wells are found to exist within the AOR, then the permittee must perform corrective action, which requires plugging those wells. 40 C.F.R. § 144.55(a). Wells in the AOR that are used as monitoring wells do not need to be plugged while they are being used for monitoring.

Penneco proposed a fixed radius of one-quarter mile (1320 feet) for their Area of Review. In support of this proposed AOR, as part of its permit application, Penneco submitted information and materials from the following sources: a survey by Fox and Fox, Inc., conversations with nearby surface landowners, a review of the Pennsylvania Bureau of Oil and Gas Management's well records, a review of the Pennsylvania Geological Survey publications covering the Area of Review, a review of the United States Geological Survey publications covering the Area of Review, a master thesis from West Virginia University by Melissa Sager (Petrologic study of the Murrysville sandstone in Southwestern Pennsylvania, 2007, hereinafter the "Sager thesis"), and a series of reservoir tests by HFrac Consulting Services. The application also provided information on other wells in the area, residents' locations, and property landowners in the Area of Review. Penneco used this information and materials along with topographic and tax maps displaying surface features (such as buildings and streams), to prepare the maps of the AOR that were included with the permit application.

To evaluate the proposed fixed radius, EPA considered past practices at the proposed site, the chemistry of the fluids to be injected, and the volume of the wastewater that will be injected. In this case, the maximum injection volume is 54,000 barrels per month. (One barrel of fluid is equal to 42 gallons so the maximum volume would be 2,268,000 gallons per month.)

In its permit application, Penneco also submitted its calculation of a ZEI around the well. The calculated ZEI would result in an AOR that was much smaller than the area covered using the fixed radius method. 40 C.F.R. § 146.6 offers the option to EPA to choose between a fixed radius AOR and a ZEI. Because the fixed radius method provided a more extensive picture of the conditions around the well, EPA chose to use a ¼ mile fixed radius AOR.

During the assessment of the Area of Review, EPA did an analysis of the surrounding wells' possible interaction with the proposed injection well. In its permit application, Penneco indicated that there are five wells within the AOR that penetrate the injection zone, none of which are abandoned. The five wells include the EPA-permitted #3A well and three active production wells. Penneco will convert the remaining well, designated API #37-003-21222, and also referred to as

the Sedat #2A well, into a monitoring well. Because of its location, this well will provide monitoring information for both the #3A and #4A wells. If any unplugged/abandoned wells that penetrate the injection zone are found within the AOR at a later date, the final permit requires Penneco to perform corrective action. Paragraph III.A.5 of the permit.

EPA notes here that, to make sure it had the best information, it also evaluated wells located outside of the AOR. Within a fixed radius of 1/2-mile from the #4A well there are a total of thirteen wells that penetrate the Murrysville Formation. (The Murrysville Formation is the geologic formation that will be receiving the injected fluid.) All thirteen wells were cased and cemented through the Murrysville Formation. This will prevent the injected fluid from migrating outside of the Formation through these other wells.

None of the information submitted by Penneco or developed by EPA during the permitting process indicates that there are any abandoned gas wells within the AOR. The commentor who made the comment about abandoned gas wells did not provide any specific information about the location of the wells, so EPA was unable to verify their location and assess their possible effect.

Besides information about other wells near the #4A well, Penneco also included as part of its permit application a one-mile topographic map which, among other things, showed that there are two abandoned coal mines in the area of the Penneco facility. The Springdale Mine is approximately 3,400 feet away. The second mine is the Renton No. 5 mine. According to the permit application, the #4A well shaft goes through the Renton Mine. Both mines have been sealed and there is currently no active mining within one mile of the #4A well.

As Penneco observed in its permit application, an abandoned underground coal mine may provide a pathway for groundwater flow, including flow from injection disposal wells such as the #4A well. However, the top of the Murrysville Formation, that is, the injection zone, is located approximately 720 below mean sea level. The elevation of the mined-out area is at 560 feet above mean sea level. This means there is about 1,280 feet of separation between the injection zone and the bottom of the mined area. Fifty feet of the 1,280 feet of separation is the Riddlesburg Shale which is the confining zone just above the Murrysville Formation.

According to the information provided by Penneco, between the confining zone and the bottom of the mine, there are two more shale formations that could serve to prevent movement of the injected fluid into the mine void. According to the Pennsylvania Department of

Environmental Protection's (DEP's) Sedat #3A Comment-Response, April 14, 2020, Response to Comment K, a geologic characteristic of shale is low permeability relative to other rock types, and therefore it would function as a satisfactory confining layer. (The DEP document was a response to comments for the state permit that DEP issued for the #3A well, hereafter "DEP #3A Response.")

EPA notes here that the requirements for construction described in the response to comment 3, which is below, will prevent the injected fluid from reaching areas where mine subsidence has occurred or will occur in the future. These requirements will also ensure that the well is robust enough to maintain mechanical integrity despite any subsidence that may occur at the well's location. (The requirements are also intended to ensure that the well maintains mechanical integrity during a seismic event.)

Concerning the comment that the #4A well site contains an abandoned gas well next to a coal mine that has been on fire for decades, this is incorrect. There is no coal mine on fire in the AOR. EPA's information is that there was an abandoned coal mine in Plum Borough that had been on fire for decades that was two miles from the #4A well. According to the DEP #3A Response (Response to Comment T) and a newspaper account, DEP had completed the first phase of a project that isolated the fire and planned a second phase to extinguish the fire.

A suitable injection zone is a primary consideration in EPA's review of a Class II UIC permit application. The determination whether to issue a UIC permit is based on specific information provided by an applicant that demonstrates the suitability of a geologic system to receive and contain the fluids proposed to be injected. When EPA evaluates any proposed injection zone, the evaluation is site-specific and based on information about the geology in the vicinity of that particular injection well.

EPA has reviewed the information in the permit application about the Murrysville Formation, *i.e.*, the proposed injection zone, to confirm its suitability for the proposed injection operation. This formation was thoroughly characterized and described in the permit application. Penneco reports that the Murrysville sandstone formation is approximately 94 feet thick, and lies at a depth of 1,706 feet to 1,800 feet below ground surface in the #4A well AOR.

Just above the Murrysville Formation is the Riddlesburg Shale (Sunbury Equivalent). This the upper confining zone. The Riddlesburg Shale, lies directly on top of the Murrysville Formation and

is a laminated shale and siltstone formation with occasional sandstone and limestone beds. The Riddlesburg is between 80 and 90 feet thick in the #4A well AOR.

Just below the Murrysville Formation is the Riceville-Oswayo Shale. It serves as the lower confining zone. This shale formation is about 30 feet thick in the AOR. This formation consists of shale and siltstones.

Two considerations that EPA takes into account when it evaluates a geologic formation's suitability to serve as an injection zone are the formation's porosity and permeability. Porosity refers to the amount of empty space within a material such as rock. Permeability is the ease with which a fluid can flow through the pores in a rock layer.

Based on porosity logs for the AOR recorded by Penneco, the average density porosity through the Murrysville Formation in the AOR is suitable for injection.

Formation permeability for the Murrysville was reported by the Sager thesis as generally high throughout the formation. A series of tests performed on the #3A well to determine the reservoir characteristics of the Murrysville Formation in the land that Penneco is leasing showed permeability is suitable for injection.

Additionally, the Region considered the historical use of the formation in evaluating its use as an injection zone. The Murrysville Formation has a demonstrated capacity for both producing and storing natural gas. It has produced natural gas over an extended period. Also, at another location several miles from the #4A well, the Formation is used as a reservoir to store natural gas. This history demonstrates the suitability of the Murrysville Formation as the injection zone for the #4A well. Taken as a whole, the Formation's thickness, porosity, and permeability make it suitable for gas and liquid storage or disposal.

The comment that this region of Pennsylvania does not have geological formations suitable for injection wells that are not already in use for gas storage is factually incorrect. The Murrysville Formation in the area of the #4A well has produced natural gas and this opens up pore space within the formation to store the injected fluid. (Any comparison between the Murrysville Formation and the Marcellus Shale Formation may be inappropriate because the Murrysville Formation is composed of sandstone while the Marcellus Shale Formation, as its name indicates, is composed of shale.)

With respect to seismicity generally and induced seismicity specifically, the SDWA regulations for Class II injection wells do not require consideration of the seismicity of the region, unlike the SDWA

regulations for Class I injection wells used for the injection of hazardous wastes. See regulations for Class I hazardous injection wells at 40 C.F.R. §§ 146.62(b)(1) and 146.68(f). Nonetheless, because of public concerns about injection-induced seismicity, for the #4A well EPA evaluated the factors relevant to seismic activity.

In general with regard to seismicity, a report from the *Commonwealth of Pennsylvania Department of Conservation and Natural Resources Bureau of Topographic and Geologic Survey*, “Earthquake Hazard in Pennsylvania” documents the known epicenters found in Pennsylvania. With regards to Allegheny County, Pennsylvania, the location of the well, per the report, there are no documented cases in which the epicenter of an earthquake was traced back to the county. On page 7 of the report, the author states, “The great majority of earthquakes occur along boundaries between tectonic plates. The reason for this is not completely clear, but it appears that stress levels are higher along plate boundaries, and that strain energy builds up more rapidly in those areas. Eastern North America, including Pennsylvania, today is far from the nearest plate boundary – the mid-Atlantic Ridge, some 2,000 miles to the East.”

The United States Geological Survey (USGS) tracks, records and maps earthquake epicenters and faults in certain areas throughout the United States. The USGS rates the probability of seismic activity in southwest Pennsylvania with sufficient intensity to cause damage as low. The USGS as well as the Pennsylvania Bureau of Topographic and Geologic Survey have not recorded and EPA has not been notified of any seismic activity that originated in Allegheny County, Pennsylvania.

With regards to seismicity produced by human activity, according to data available to Region 3 in 2013, there had been very few documented cases of injection well-induced seismicity in the United States compared to the large number of wastewater disposal injection wells then in operation. Induced Seismicity Potential in Energy Technologies, National Academy Press, 2013, at p. 10-11, quoted in the Region 3 framework for evaluating seismic potential associated with UIC Class II permits (“Framework”). Since 2013, as far as the Region is aware, there have not been any cases of well-induced seismicity in Pennsylvania.

Region 3 has addressed the issue of induced seismicity more fully in the Framework. Much of following discussion is taken from the Framework.

Scientists have long recognized that human activities, such as construction of dams and water reservoirs, mining and oil and gas

production, can trigger seismic events, including those that are felt by humans. Under certain conditions, disposal of fluids through injection wells has the potential to cause human-induced seismicity. However, induced seismicity associated with fluid injection is uncommon, as additional conditions necessary to cause seismicity often are not present.

Seismic activity induced by Class II wells is likely to occur only where all of the following conditions are present: (1) there is a fault in a near-failure state of stress; (2) the fluid injected has a path of communication to the fault; and (3) the pressure exerted by the fluid is high enough and lasts long enough to cause movement along the fault line.

A fault is a fracture or a crack in the rocks that make up the Earth's crust, along which displacement (that is, when one body of rock moves with respect to another) has occurred. The presence of a fault in a formation receiving injected fluid potentially creates a more vulnerable condition for a future seismic event. During an earthquake, energy is radiated away from the area of the fault in the form of seismic waves. This causes the ground to move as the seismic waves travel away from the fault. Depending on the force of an earthquake, seismic waves can travel far away from the epicenter, and thus be felt far from where the fault is located.

Scientists believe that injection can cause seismicity when the pore pressure in the formation increases to such levels as to overcome the friction force that keeps a fault stable. Pore pressure (the pressure of fluid in the pores of the subsurface rocks) increases with increases in the volume of fluid injected and the rate of injection. Thus, where a fault exists in the formation receiving the injected fluid, the probability of triggering a significant seismic event during injection increases as the volume and rate of injection increase.

In addition, the larger the volume injected over time, the more likely the fluid intersects a fault because the fluid will travel farther within a formation. When injected fluid reaches a fault, frictional forces that have been maintained within that fault can be reduced by the fluid. At high enough pore pressure, the reduction in frictional forces can cause the formation to shift along the fault line, resulting in a seismic event. Therefore, limiting both the volume of the fluids injected and the injection rate checks the potential for seismicity.

Increases in pore pressure due to the volume of fluid injected and the rate of injection can act on existing faults and provide a mechanism for induced seismicity. Most examples of injection-induced seismicity

are in cases where the receiving formation has low permeability and/or the pressure or volume of fluid injected over time is quite large.

Where permeability is not low in a formation, injected fluid flows reasonably easily through the pores in this rock and therefore flow is oriented mainly through the formation and not through existing fractures or faults in the rock. Injection into a more permeable sedimentary formation is much less likely to induce seismicity.

Because of the likelihood of greater permeability and the reduction in pore pressure in formations with a significant history of oil and gas production, injecting into such formations is unlikely to cause seismicity. The production of oil and/or gas, with the accompanying brine produced during such operations, results in the removal of large amounts of fluid from the formation. That means there has been a corresponding decrease in pore pressure in the formation. If injection occurs into these depleted reservoirs, pore pressure may not reach the original levels, and in some cases, may not increase at all due to the relative volumes of injection versus extraction.

In formations with a long-term history of oil and/or gas production, more information is generally available about the geology of the formation, such as well drilling records that can provide information about injection and extraction rates and displacement of geologic formations (which could be indicative of faults). The Murrysville formation has been extensively used for gas production. Also, as shown by a natural gas storage facility known as the Oakford Storage Facility located in Westmoreland County, PA, it has a demonstrated capacity for gas storage, another indication of its suitability for injection.

The characteristics of the Murrysville Formation particularly in the Area of Review make it unlikely that induced seismicity will occur as result of well injection. There are no known faults in the AOR and no history of seismicity in the Formation. (The final permit will provide that Penneco shall only inject produced fluids through the injection well and into a formation which is overlain by a confining zone free of known open faults or fractures within the Area of Review, as required pursuant to 40 C.F.R. § 146.22.) Again, according to data submitted by Penneco, the Formation's porosity and permeability in the AOR make it suitable for injection.

To minimize conduits for fluid to potentially contaminate USDWs, operating conditions in an injection well permit can expressly limit the injection pressure to prevent fracturing (that is, the cracking of the rock) of the injection zone. The fractures could act as conduits through which fluid could flow and act upon an existing fault. In order to

induce seismicity, pressure from the fluid injection would, first, have to be great enough to create or reopen fractures that would act as conduits and, second, would have to exert enough pressure and flow to overcome the frictional forces in the fault and thereby destabilize it. See the response to comment 3 for a description of conditions imposed by the final permit on well operations that are meant to prevent fracturing.

Of the hundreds of thousands of injection wells operating in the United States, EPA is not aware of any case where a seismic event caused an injection well to contaminate a USDW nor is it aware of any reports of earthquakes having affected the integrity of injection wells in the cases of induced seismicity in Ohio, Texas, Oklahoma, West Virginia, or Arkansas.

A number of factors help to prevent injection wells from failing in a seismic event and contributing to the contamination of a USDW. Most deep injection wells, that are classified as Class II injection wells are constructed to withstand significant amounts of pressure. They are typically constructed with multiple strings of steel casing that are cemented in place. The casing in these wells is designed to withstand both significant internal and external pressure. The American Petroleum Institute (API) (see www.api.org) and oil and gas service companies such as Halliburton Services (see [Halliburton Cementing Tables](#), 1980), have developed industry standards for casing and cementing wells. Drillers are required to follow these standards. (See the response to comment 3 for details about the construction of the #4A well.)

Furthermore, as also described in the response to comment 3, the final permit requires the well to be mechanically tested to ensure integrity before it is operated and will be continuously monitored during operation to ensure that the well's mechanical integrity is maintained. If a seismic event were to occur that affected the operation and mechanical integrity of the well, the well is designed to automatically detect a failure due to pressure changes in the well annulus between the long string casing and the injection tubing which would cause the well to automatically stop injection. See Paragraph 11.C.2 of the permit.

The Region notes here in passing that, as part of its permit application, Penneco submitted what it characterized as a seismic monitoring and mitigation plan for the #4A well. Such a plan is not a requirement of the Federal UIC Program and is not required by the final permit. This type of plan may be something that Pennsylvania requires. Penneco also has this type of plan for the #3A well.

According to the plan for the #4A well, Penneco will monitor for any seismic and earthquake events at the #4A well site and in the vicinity. The monitoring equipment and seismometer stations would notify Penneco, Incorporated Research Institutions for Seismology (IRIS) and the Pennsylvania Seismic Network (PASEIS) via Penn State University of any detection of naturally occurring and manmade seismic occurrences or events. While such a plan may be useful for recording seismic activity, it was not a consideration for the Region in evaluating the permit application.

Given all that is stated above, EPA thinks that the site conditions for the #4A well are favorable for injection.

COMMENT 3: There are concerns about the initial integrity of the well as well as Penneco being able to maintain the well's integrity during its operation. One specific concern was that Penneco is going to be using an old gas well as the injection well. Other commentors anticipated that the cyclic nature of injections could cause a failure of a well casing from an old well. A related concern was that the brine in the injected fluid will corrode the walls of the well. Several commentors thought that EPA should require testing more frequently for mechanical integrity because leaks from wells can last for years. A third commentor asserted that without a mathematical/analytical model to predict the probability of well leakage, it is impossible to deem the well sufficiently safe. A fourth commentor objected that the measures Penneco intends to use to protect the mechanical integrity of the #4A well was used for the #3A well and it is statistically unlikely that the same proposed measures will be sufficient to protect the #4A well from failure.

RESPONSE: Proper construction and mechanical integrity testing of injection wells are cornerstones of the UIC regulations and are integral to EPA's permit application review process. Setting appropriate operating requirements and conditions in the final permit are also important. EPA evaluated information about the #4A well's construction and the procedures by which it will be converted from a production well to an injection well. The information includes a well schematic for the production well as it was drilled and completed in 2004; the well schematic for the proposed Class II well, and the proposed conversion procedures.

When the #4A well was drilled in 2004, it was for the production of natural gas. The well was originally drilled to a total depth of 3,925

feet. For conversion, the existing well be cemented from the bottom of the well back to an approximate depth of 1,850 feet.

With conversion, the well will have a pipe in the center, referred to as a tubing string. When the well is complete, Penneco will inject the fluid down the tubing string. Surrounding the tubing string will be a series of casings, that is, steel tubes. The purpose of the casings is to prevent the movement of injected fluid into any USDWs.

The first casing around the tubing string, the long string casing, goes from the ground surface to a depth of 1,680 feet. A second casing, the intermediate casing, which was part of the gas production well, will be around the outside of the long string casing and will run from the surface to a depth of 1,906 feet. (Usually, the long string casing is longer than the intermediate casing unlike the configuration of the #4A well. Here, EPA is still satisfied that the measures that Penneco has proposed to convert the #4A well from a production well to an injection well will enable the well to maintain mechanical integrity.)

A third casing, the surface casing, goes around the intermediate casing and will run from the surface to a depth of 564 feet. The surface casing will protect the lowermost USDW which is approximately 412 feet below ground surface. (A fourth casing will go around the surface casing, but it does not go deep enough to protect the lowermost USDW.)

To prevent fluid from escaping the casings and contaminating a USDW, for some casings, Penneco will pump cement around the outside of the casings. For another casing, it will pump grout around the casing's outside.

As discussed in the response to comment 2, fluid will be injected into the Murrysville Formation. Penneco has chosen this formation because it is the most receptive to injection of all the geologic formations the #4A well goes through. Injection will be done through perforations in the intermediate casing and the cement. The perforations are between 1,740 feet to 1,800 feet below ground surface.

An additional component that Penneco must install in the injection well is a packer. The packer is shaped like a doughnut and goes around the tubing string at about 100 feet above the injection zone. It serves as a dam that forces injected fluid out the perforations and prevents any injected fluid from flowing farther up between the tubing string and the long string casing.

Penneco also fills the space in the long string casing above the packer, which is referred to as the annulus, with liquid. The pressure of the liquid in the annulus is monitored because any significant changes in the pressure indicates that there is a problem with the well.

Following the conversion of the #4A well to an injection well, Penneco may not initiate injection operations until it: (i) conducts an initial test to demonstrate the mechanical integrity of the injection well, in accordance with 40 C.F.R. § 146.8; and (ii) receives notice from the Director of the EPA Region 3 Water Division that such a demonstration is satisfactory, in accordance with Paragraphs II.D.2 and III.A.4 of the permit. 40 C.F.R. § 146.24(c)(2). An injection well has mechanical integrity if “there is no significant leak in the casing, tubing or packer;” and “there is no significant fluid movement into an underground source of drinking water through vertical channels adjacent to the injection well bore.” 40 C.F.R. § 146.8(a). To demonstrate mechanical integrity a permittee must use the tests identified in 40 C.F.R. § 146.8.

Besides the initial mechanical integrity test, Penneco must, over the life of the permit, demonstrate and maintain the mechanical integrity of the well. 40 C.F.R. § 146.23(b)(3) and Paragraphs II.C.7 and II.E.1 of the permit. Per Paragraph II.C.7 of the permit, Penneco must demonstrate mechanical integrity at least once every two (2) years and after any repair, modification, or rework of the injection well.

Further, Penneco must maintain and operate the well to make sure that the well’s mechanical integrity continues during its operation. During the well’s operation, Penneco must provide continuous monitoring of surface injection pressure, annular pressure, and cumulative injection volume as required in Paragraph II.C.2 of the permit. To do this, the tubing annulus will be kept full of fluid and monitored with a pressure gauge at the wellhead for any pressure anomalies or changes in the fluid level due to packer or tubing failure. (Note that the flow rate is also measured but that can be done upstream of the wellhead in piping that transmits fluid to the well.)

If a leak were to develop in the tubing or packer, the annular pressure would increase significantly. If the well experiences a leak in the long string casing, the pressure in the annulus would decrease significantly. Either situation would automatically trigger shut-off devices that would cause the well to shut down and cease operating. This would constitute a mechanical integrity failure of the well and, in accordance with Paragraph II.C.7 of the permit, Penneco would be required to cease injection immediately and to make the necessary repairs.

The final permit requires Penneco to submit data on the amount of pressure necessary to fracture the formation and determine the instantaneous shut-in pressure. Instantaneous Shut-In Pressure

("ISIP") is the minimum pressure necessary to begin to re-open fractures created during the hydraulic fracturing process for oil and gas production. This pressure is significantly lower than the fracture pressure, that is, the pressure that would cause new fractures in the rock to open or activate any unknown faults. As a safety measure, the Region mandates that Penneco use the ISIP as a basis to establish a surface Maximum Allowable Injection Pressure ("MAIP") and thereby prevent the initiation or propagation of fractures in the receiving formation. The fractures could create conduits for the injected fluid to flow to any existing faults.

The final permit includes a formulation for determining the MAIP. (The formula and information about the values used to calculate the surface MAIP can be found in Paragraph III.B.4 of the permit.) To calculate the MAIP, it first requires calculating the value for the Fracture Gradient. The calculation uses the ISIP, the highest expected specific gravity value for the injected fluid, the distance between the surface and top of Murrysville Formation, and a constant value. Next it requires using the Fracture Gradient value, the highest specific gravity value, the distance value, and the same constant value to arrive at the MAIP.

In addition to the MAIP, as noted elsewhere, the final permit limits how much fluid can be injected in a month. Again, this limit is set at a volume that will not open or extend any fractures or disrupt any unknown faults in the area.

Paragraph II.C.6 of the permit imposes another protective measure that Penneco must implement. Penneco must maintain a record of every load of wastewater received for injection. The record must include the name of the company that transported the wastewater to the well, the name of the company that operated the production well that was source of the wastewater, the location of the wastewater source, and the load volume.

Some of the loads of wastewater that Penneco receives at the well may include wastewater from more than one source. These type of multi-source loads are called split loads. Penneco must record whether a load was a split load. If the load is a split load, it must record the companies that operated the production wells that were the source of the wastewater, the wells' locations, and the volume from each well. Also, for each split load, as well as for each load that comes from just a single source, Penneco must test it for specific gravity. Paragraph II.C.5 of the permit. This last measurement is necessary to ensure that the well does not exceed its MAIP.

When Penneco elects to no longer operate the injection well, the well must be permanently plugged and abandoned in a manner that does not allow movement of fluids into or between USDWs. Penneco must use appropriate plugging procedures and materials in accordance with Paragraph II.D.11 of the permit.

Additionally, to make sure proper plugging will occur, Penneco must demonstrate it has made arrangements for financial assurance that will ensure that adequate financial resources are available to pay for plugging the injection well should Penneco experience financial difficulty and be unable to pay for the plugging. Paragraph III.D of the permit requires Penneco to secure an Irrevocable Letter of Credit in the amount of at least \$13,397.10 as financial assurance. The funding provided by the Irrevocable Letter of Credit will be able to cover the estimated cost to close, plug and abandon the injection well and is based upon an independent, third-party professional's estimate of the costs associated with the plugging and abandonment of the #4A well. The funding must be sufficient to preclude the possibility of abandonment without proper plugging and closure. Authorization to construct and operate the injection well will not be given by EPA until sufficient financial assurance is in place.

Based upon an extensive review of the initial construction of the #4A well, Penneco's proposed conversion procedures and the final permit's requirements for continuous monitoring and periodic pressure testing, EPA is confident that the well will maintain its mechanical integrity throughout the duration of injection operations. This confidence is based EPA's experience of permitting injection wells in Region 3. Though EPA does not use an analytical model to predict the probability of well leakage, EPA has no reason to expect any leakage based upon Penneco meeting the aforementioned permit conditions and mechanical integrity requirements and EPA's experience with injection wells in Pennsylvania.

COMMENT 4: One commentor questioned the current saturation and ultimate receptivity of the Murrysville Formation. Geological knowledge suggests a porous rock matrix will reach an ultimate point of storage capacity at which it will no longer be able to hold injected fluid. No ultimate receptivity point was reported by Penneco during the geological reporting phases, nor was it provided to the public by the EPA.

RESPONSE: As discussed in the response to comment 2, it is EPA's analysis that the Murrysville Formation in the AOR is very suitable to receive the injected fluid. The commentor is correct that the Formation's rock matrix around the well will reach an ultimate point of storage capacity at which time it will no longer be able to hold injected fluid. As saturation increases, the pressure in the rock pore space will rise and will eventually reach the ultimate point of storage capacity. Paragraph II.C.2 of the permit requires Penneco to continuously monitor and record this pressure, the surface injection pressure, to check that it is not exceeding the MAIP.

As discussed in the prior response to comment, Penneco will calculate a proposed MAIP that EPA reviews and approves, Paragraph III.B.4.c of the permit. When the well reaches the point where, because of saturation in the formation, the well's surface injection pressure has reached the permit limit, the MAIP, Penneco must stop injection and plug and abandon the well. Paragraph III.B.4.b of the permit.

The #3A well's permit also has a MAIP. Because both wells are injecting fluid into the other well's AOR, it is possible that either well's surface injection pressure will reach the well's MAIP limit sooner than if each well was the only well in their respective AORs. This means that both wells' useful life could be shorter than if they both had AORs without another injection well in them.

Concerning the comment that EPA did not provide a receptivity point in the final permit that, when reached, the injection must stop. EPA is unfamiliar with the term "receptivity point." It is unknowable before injection starts what the ultimate storage capacity of the formation is. As noted in the first paragraph of this response, as saturation increases, the pressure in the rock pore space will rise and will eventually reach the ultimate point of storage capacity. At that point, injection must stop.

COMMENT 5: Penneco cannot be trusted to maintain the health and safety of residents. Will Penneco be held responsible if something goes wrong? Plum Borough does not have the resources to properly supervise or fight for appropriate regulatory oversight. Enforcement of regulations needs to be strengthened.

RESPONSE: EPA emphasizes that it expects all UIC well operators to comply with applicable regulatory requirements as well as their UIC permit conditions. An operator's failure to comply with a permit

requirement, including monitoring and reporting requirements, subjects that operator to possible civil penalties, criminal penalties, or both.

As part of ensuring permit compliance, EPA inspects every Class II disposal well in Pennsylvania at least annually. In addition, permittees must submit an annual report to EPA for review that at a minimum summarizes the results of required monitoring including monthly records of injected fluids, and any major changes in characteristics or sources of injected fluid. 40 C.F.R. §§ 146.23(b) and (c). The inspections and report reviews help ensure operator compliance with the UIC requirements.

EPA also acknowledges commenters' general concerns about the oil and gas industry, including past violations and the industry's perceived unwillingness to address spills or contamination. Some commenters expressed concern about evidence of noncompliance in the industry and EPA's lack of vigilance. However, EPA has taken action to protect the public when issues arose with particular UIC wells.

COMMENT 6: Environmental justice issues impact where companies choose to put injection well sites. It is unfair to attempt to saddle Plum Borough with any injection wells.

RESPONSE: As noted in the response to comment 22, the UIC Program's regulatory criteria prescribes the factors EPA can consider when it determines whether to issue a UIC well permit. The surface location of a UIC well is not one of the regulatory criteria.

However, as it does with all UIC permit applications, EPA tasked its Office of Communities, Tribes and Environmental Assessment with screening for Environmental Justice factors in the AOR. The screening used demographic information to assess the area for Environmental Justice issues. The screening found that further evaluation of the site for Environmental Justice issues was not necessary. However, when EPA issues a UIC permit, it may include conditions to protect drinking water for all communities, including communities with environmental justice concerns, even if the community does not formally qualify as an Environmental Justice community based on the factors EPA uses for its assessments.

The UIC permits EPA issues must ensure that the injection will not "endanger" underground sources of drinking water. "Endangerment" is defined to include any injection that may result in the presence of a contaminant in a drinking water supply that "may . . .

adversely affect the health of persons.” Section 1421(d)(2) of the Act, 42 U.S.C. § 300h(d)(2).

EPA’s Environmental Appeals Board (EAB) has considered the scope of EPA’s authority to address environmental justice in the UIC permitting program. The EAB has stated that EPA may consider environmental justice in two areas: (1) expanding public participation and (2) exercising its discretion under its UIC omnibus regulatory authority under 40 C.F.R. § 144.52(a)(9) to “impose, on a case-by-case basis, permit conditions ‘necessary to prevent the migration of fluids into underground sources of drinking water’” in order to protect underground sources of drinking water “upon which the minority or low-income community may rely.” *In re Envotech, L.P.*, 6 E.A.D. 260 (EAB 1996).

As noted elsewhere in this Response to Comments document, when EPA issues a UIC permit, it may not add conditions to address other types of impacts—such as negative economic impacts on the community, diminution in property values, or proliferation of undesirable land uses—that are not specifically related to the protection of the drinking water. However, the EAB has stated that EPA may and “should, as a matter of policy, exercise its discretion under 40 C.F.R. § 144.52(a)(9) to include within its assessment of the proposed well an analysis focusing particularly on the minority or low-income community whose drinking water is alleged to be threatened.”

Based on this analysis, EPA may impose permit conditions on a case-by case basis under this omnibus authority to ensure that proposed injection wells will not result in migration of fluids to underground sources of drinking water used by communities with environmental justice concerns. EPA’s authority applies in all cases, “regardless of the composition of the community surrounding the proposed injection site.” (40 C.F.R. § 144.52(b)(1) may also provide EPA with broader authority to consider factors specific to communities with environmental justice concerns (e.g., disproportionate reliance on groundwater, cumulative health impacts from multiple sources of toxicity) in assessing whether additional permit conditions are necessary to prevent injection that may “adversely impact the health of persons” within the meaning of “endangerment.”)

In this instance, to address concerns of the community, EPA held two public hearings to take comments on the draft permit and extended the public comment period. Further, as it does for all the UIC permits it issues, EPA worked to ensure that it is issuing a final permit with conditions necessary to prevent the migration of fluids into

underground sources of drinking water in order to protect the drinking water sources upon which the community may rely.

COMMENT 7: Concerns about fracking and the wastewater it produces in general as well as reports of fracking wastewater contaminating surface waters in Ohio, Texas, and West Virginia further support residents' concerns about the safety of injection wells. There are similar serious concerns with gaps in information regarding the long-term effects of injection wells.

RESPONSE: Public and privately owned wastewater treatment facilities are unable to adequately remove many constituents found in brine that result from the hydraulic fracturing for oil and gas production. Chlorides and bromides are two examples of such constituents. When these constituents are discharged to streams or rivers, they can pose serious risk to fish and other aquatic organisms living in the stream as well as contribute to serious health effects for people who obtain their drinking water from these streams and rivers. The UIC permitting program is designed to provide an alternative through which injection activities may occur in a regulated and environmentally protective manner which ensures that best management practices are identified and employed.

The Program's regulations were promulgated to protect groundwater that qualifies as a USDW and, as a consequence, would also protect surface waters. The final permit adheres to the UIC Regulations, found in 40 C.F.R. Parts 144, 146, and 147, which address subsurface injection activities, and which provide a regulatory scheme that ensures the thorough and proper siting, casing, monitoring, and confinement activities that are protective of USDWs. EPA notes that the UIC Program has been in existence since 1984 and Region 3's UIC program has proven to be effective in implementing UIC regulations and protective of USDW's.

COMMENT 8: DEP is understaffed and incapable of enforcing penalties or corrective action.

RESPONSE: In Pennsylvania, EPA is the primacy agency responsible for enforcement of the UIC Program. As discussed in the response to comment 5, EPA takes enforcement action when there are violations of the UIC permit program.

COMMENT 9: State and local governments should reject this permit. This permit is objected on behalf of Oakmont Borough. Issuing a permit for the #4A well denies state and local governments the ability to protect their residents. Plum Borough has an ordinance restricting the location of injection wells to heavy industrial areas.

RESPONSE: EPA's permitting decision for the #4A well is focused on ensuring that injection operations do not endanger any USDWs that might serve as a source of drinking for the community. EPA does this through a thorough evaluation of the permit application and setting UIC permit conditions for construction, testing, maintenance, and financial assurance. This will safeguard that Penneco maintains the well's mechanical integrity throughout its life and that it will be properly closed.

Regarding the legal authorities of state and local governments, EPA takes the position that issuance of the permit has no effect on a permittee's obligation to comply with State statutory and regulatory requirements and local ordinances. Subsection 1423(d) of the SDWA, 42 U.S.C. § 300h-2(d), is the basis for this stance. Paragraph I.D.11 of the final permit restates this position. It reads, "Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation." In addition, Paragraph I.A of the permit states, "Issuance of this Permit does not convey property rights or mineral rights of any sort or any exclusive privilege; nor does it authorize any injury to any persons or property, any invasion of other private rights, or any infringement of State or local law or regulations."

COMMENT 10: Penneco doesn't have the right to pump waste beneath homes without owners' permission.

RESPONSE: The UIC program does not have authority to determine sub-surface rights when issuing a permit, such as the right to discharge wastewater that moves as an underground plume into a neighboring property. Legal issues relating to property ownership or lessee rights are issues between the permittee and property owners and are subject to State and local law. Under federal UIC regulation, a permittee is only required to demonstrate that the operation of the well will not allow contaminants to move into a USDW. Issuance of a permit neither confers the right to trespass nor conveys property rights of any

sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. This is the case with respect to all classes of UIC wells, including those which inject wastewater associated with oil and gas production.

40 C.F.R. §§ 144.35(b), (c) and 144.51(g) support the position that the permit does not convey any property rights, which would include rights. Paragraph I.A of the permit quoted in the response to comment 9 reiterates this.

COMMENT 11: Sedat 1A and Sedat 2A wells should be inspected before the #4A well is permitted.

RESPONSE: Both the Sedat 1A and Sedat 2A wells were gas production wells. Therefore, EPA did not issue UIC well permits for them, and they were not subject to inspection by the EPA UIC Program.

The Sedat #1A well now serves as a monitoring well for the #3A well. Sedat #2A will serve as a monitoring well for the #4A well. The Sedat #2A well is in the #4A well's AOR while the other well is just outside the AOR. Penneco showed both wells on the maps it included with the permit application for the #4A well. See the response to comment 2 for a discussion of EPA's evaluation of the features of the AOR and the surrounding, including these two wells.

Paragraph II.C.4 of the permit requires Penneco to measure the fluid level in the #2A well twice a year. EPA added a requirement to the final permit that, if the fluid level in the well is too high, Penneco must cease injection until it returns to level stated in the permit. This requirement serves to protect the USDW by limiting the volume of fluid injected in the #4A well.

Both monitoring wells are regulated by DEP under its oil and gas regulations. The UIC permits only reference the wells for monitoring purposes. The regulatory permitting, operation, financial responsibility and closure requirements for the wells rests solely with DEP.

COMMENT 12: Based upon the history of the #3A well, EPA should deny the #4A well permit. Further, EPA should withdraw the #3A well permit.

RESPONSE: While EPA has reviewed all well-related information provided by commenters concerning the #3A well, the Agency must

stress that its evaluation of the subject permit application is limited to ensuring that the #4A well does not endanger USDWs. This individual response to comments addresses concerns about the #3A well without regard to how the operation of the #3A well might affect the operation of the #4A well. There are other responses in this Response to Comments document that address the potential interaction of the two wells or how the operation of the #3A well reflects on EPA's UIC program generally.

The specific complaints pertaining to the #3A well raised concerns about induced seismic activity and mine subsidence, structural issues including a "casing failure," allowing the #3A well to be converted from a gas production well to a wastewater injection well, the near failure of a mechanical integrity test, contamination caused by the well, permit violations by Penneco, and air pollution from the well. Comments also raised the concern that issuing the #3A well permit denied state and local governments the ability to protect their residents.

First, as a general response, EPA replies that on June 28, 2023, an EPA inspector visited the #3A well site. The purpose of the visit was to witness a Mechanical Integrity Test conducted for the well. The well passed the test. While there, the inspector did not observe any issues with the well.

EPA has addressed concerns about seismic activity and mine subsidence with regards to #4A well in the response to comment 2. The discussion in the comment about seismic activity applies equally to the #3A well. Also, as discussed in the same response, mine subsidence should not be an issue for the #3A well because of the measures Penneco took during the well's construction and since then to maintain the well's mechanical integrity.

A number of commentors focused on a problem in 2021 at the #3A well and contend that this incident resulted in leaks from well. The allegation was that there was some type of "casing failure," or some other type of failure with the well which caused a leak. Relatedly, a commentor suggested that the lack of a leak detection zone was a problem. These contentions are incorrect.

On June 14, 2021, Penneco informed EPA that it was experiencing several packer seal issues that resulted in the increase of the annular pressure in the #3A well. To correct the situation, Penneco proposed to rework the construction of the well. For the rework, Penneco installed an additional string of casing cemented to the surface and a new string of injection tubing that rested on a new packer. After Penneco completed the well rework, on June 30, 2021, it submitted a report to EPA about the about the well rework, including the results from a

successful mechanical integrity test. Penneco's data showed that, apart from the normal injection of fluid into the injection zone, at no point was there any loss of injectate fluid from the annulus or elsewhere from the well. Since this incident, EPA has not seen any other incidents where there was a problem with the well's construction.

One commentor noted that with replacement of the packer, the #3A well, as a converted well, had one item with integrity where a brand new well would have three. In the response to comment 3, EPA discusses the conversion of a production well to an injection well with regards to the #4A well. The thrust of that response equally applies to the #3A well.

Related comments alleged that the #3A well had contaminated nearby drinking water wells or a geothermal well. Neighbors in the vicinity of the #3A well commented that their water "appeared brown and hazy," "was undrinkable," and emits "foul" and "noxious odors."

EPA received a complaint on December 16, 2021, through the EPA's reporting system about the #3A well's casing causing drinking water problems. On January 25, 2022, EPA responded to the complaint stating that EPA was aware of an issue with the well's packer but that no fluid had leaked from the well. EPA had also forwarded the complaint to DEP for the State agency's information.

EPA understands that the same complaint was submitted to DEP. The DEP conducted an investigation, including sampling for contaminants, and determined that the drinking water supplies mentioned in the complaint were not adversely affected by the #3A well. While DEP did not sample for all possible contaminants, its sampling regime included tests for contaminants, for example, chloride, that would have indicated if there was a contamination problem caused by the #3A well. (One of the commentors referred to contamination of two drinking water wells. However, EPA has not seen data for two wells. This may be a reference to a well and a spring since DEP in its investigation of the complaints from neighbors took samples from a neighboring well and a spring.)

Because of the results of DEP's investigation, the lack of a leak detection zone is irrelevant. EPA notes that the commentor who raised this issue relied on an internal DEP memorandum to support the comment. However, the memorandum itself only suggests that a leak detection zone might be useful but that one is not required.

Also, there was a comment that the #3A well contaminated a nearby geothermal well. Again, the DEP conducted an investigation of this issue, which included sampling for contaminants, and determined

that the geothermal well was not adversely affected by the #3A well. As with its other investigation, while DEP did not sample for all possible contaminants, its sampling regime included tests for contaminants that would have indicated if there was a contamination problem caused by the #3A well. EPA has not received any information about any other ground water contamination that the #3A well may have caused.

One commentor was concerned about a mechanical integrity test for the #3A well conducted in June 2021. The commentor noted that there was a 3% loss of pressure, which they characterized as a near failure. Further, they were concerned that, if they same type of test were conducted for the #4A well, it was statistically unlikely the same proposed casing mitigations from the #3A well would be sufficient to protect the #4A well from failure.

EPA does not agree with these assertions. When a well's mechanical integrity is tested by using a pressure test on the annulus, a certain amount of pressure loss often occurs even though the well maintains mechanical integrity. The standard annulus pressure test is based on the principle that a pressure applied to fluids filling a sealed vessel will persist. However, the well's annulus, though closed, is still subject to the transfer of heat to or from its surroundings. When the well is shut in (no fluid is being injected), part of the well bore may cool and part may become warmer. As this happens, the liquid in the annulus contracts or expands often resulting in pressure changes. Because liquids are only very slightly compressible, any variation in temperature will likely result in a change in pressure. So, it is very unlikely that the annulus pressure will appear to remain absolutely stable either while the well is shut in or being used for injection. Therefore, an allowance for small pressure changes is necessary to account for expansion and contraction of the liquid in the annulus due to heat transfer in the well bore.

Reviewing the State primacy programs for a selection of States that have UIC primacy, States treat this phenomenon differently. Some states do not allow any pressure loss while others allow up to a 10% loss. Region 3's position is that wells may experience up to a 5% loss and still maintain mechanical integrity.

Another concern was that radioactive contamination of drinking water by injected fluid from the #3A well could lead to cancer and other serious health effects. The response to comment 16 below addresses the concern that the #4A well will be injecting fluids that are toxic, radioactive, or hazardous. While ingestion or other exposure to these

fluids certainly could have deleterious effects, the measures described in that comment and elsewhere in this Response to Comments document provide for the protection of underground sources of drinking water. Similar measures are in place for the #3A well and its permit requires these measures in order to provide mechanical integrity.

Some commentors expressed a concern that when EPA issued the #3A well permit, this denied state and local governments the ability to protect their residents. EPA's response to comment 9 addressed this concern for the final permit for the #4A well. The two permit provisions discussed in that response are also in the #3A well permit and the reasoning discussed in that response applies here as well.

Many commentors expressed concern that Penneco had violated the state permit for the #3A well. First, in 2020 Penneco did not maintain some required erosion controls at the site, most likely when Penneco was converting the site for use for injection. In response, DEP issued a notice of violation. Penneco corrected the problems and DEP took no further action.

Second, Penneco failed to notify DEP within 24 hours of receiving a complaint about the #3A well causing contamination of a drinking water supply. In response, DEP issued a notice of violation to Penneco but took no further action.

While not excusing these violations, EPA notes that they were not violations of Penneco's Federal UIC permit for the #3A well and Penneco has not violated its Federal UIC permit since it was issued. Also, for the second violation, Penneco did notify EPA of the complaint but not DEP. DEP took no further actions after issuing the notices of violation.

With regards to potential air pollution caused by the well, the Safe Drinking Water Act empowers EPA to protect against activity involving public water systems or underground injection that endangers human health or the environment. This means the UIC permit program addresses UIC issues. It does not address any potential air pollution that might be caused by the #3A well.

The comment that EPA should withdraw the #3A well permit could be interpreted as a request to terminate, or revoke and reissue the UIC permit for the #3A well. A UIC permit can be revoked and reissued under 40 C.F.R. § 144.39(b) if: (1) there is cause to terminate the permit under 40 C.F.R. § 144.40 and revocation and reissuance is appropriate, (2) there is a proposed transfer of the permit; or (3) if a determination has been made that the injected waste is a hazardous waste as defined by 40 C.F.R. § 261.3 either because the definition has

been revised or because a previous determination has been changed. The second and third conditions do not apply here, and no one has asserted that they do. There has not been a proposed transfer of the permit and there have been no changes concerning whether the injected waste is a hazardous waste as defined by 40 C.F.R. § 261.3.

With regards to the causes for terminating a permit, 40 C.F.R. § 144.40(a) provides three reasons for terminating a permit: a permittee has not complied with the permit; a permittee did not fully disclose all relevant facts in the application or during the permit issuance process, or misrepresented the facts at any time; or EPA determines that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination.

As for the first cause, there have not been any violations of the Federal UIC permit since EPA is only now issuing the permit. As to the second cause, EPA is not aware of any misrepresentations by Penneco or non-disclosure of facts by the company.

With regards to the third cause for termination, EPA has discussed above all the information it has about the #3A well. Currently, none of information demonstrates that the well endangers human health or the environment. Therefore, there is no cause to terminate the #3A well permit under 40 C.F.R. § 144.40. There is also no basis to revoke and reissue the permit.

COMMENT 13: EPA allowed a large increase the amount of fluid injected at the #3A well without notifying the public.

RESPONSE: For the minor modifications of UIC permits (40 C.F.R. § 144.41), EPA regulations allow for the modifications without issuing public notice and taking public comments. 40 C.F.R. § 124.5(c)(3). 40 C.F.R. § 144.41(e) specifically includes in the category of minor modifications a change to the quantities or types of fluids injected which are within the capacity of the facility as permitted and, in the judgment of the Region, would not interfere with the operation of the facility or its ability to meet conditions described in the permit and would not change its classification. After Penneco started to inject fluid in the #3A well, it submitted data to the EPA that demonstrated it could increase the volume of injected fluid without exceeding the pressure limitations. On this basis, EPA agreed to allow an increase in volume for the #3A well.

Another commentor raised the related issue that issuing a permit for the #4A well will double the amount of fluid injected within a small

area, that is, both the #4A and #3A wells will be injecting there. The response to comment 4 addresses this issue.

COMMENT 14: EPA's records of injection wells in Pennsylvania is inconsistent with DEP's records.

RESPONSE: While this comment is not directly relevant to the permit for the #4A well, the Region 3 UIC Program will still address it. The commentor who submitted this comment based it on a Freedom of Information Act (FOIA) request for an inventory of wells in Pennsylvania.

The commentor is correct that EPA's records and DEP's records do not always match. This is in part because many UIC wells in Pennsylvania were drilled prior to the establishment of the Federal UIC Program by the SDWA. Some of these wells are now covered by a Federal area UIC permit rather than an individual permit. Given the historical record, EPA tries to maintain an accurate record of wells and correct any mistakes that may have occurred.

According to the commentor, at the time of the FOIA request, Region 3 had 23 wells recorded in its files. The commentor asserted that for four of the 23 wells, the API (American Petroleum Institute) number and the name of the well did not match. However, since the API number is the standard for tracking wells in the United States, EPA responds that the inconsistency does not matter because EPA uses the API number in tracking the wells.

According to the commentor, there were five wells that were found in DEP's records but not in EPA's files and the wells did not have a UIC permit. EPA reviewed these five wells and responds that these wells are not in EPA's list because they are plugged oil and gas wells. Since EPA does not issue permits for plugged wells, it would have no records for them.

According to the commentor, there were two wells where EPA did not have the API numbers for the wells. Also, there were three wells where DEP's records and EPA's records did not agree on the type of well. EPA is unsure which wells these comments refer to. However, while checking on the comments, we did find that there was one well where the API number was incorrect, and we corrected it.

According to the commentor, there was one well that was rule authorized but never commenced operation. The Region responds that, since the well never commenced operation, it is unlikely that the Region would have further records for it.

Finally, according to the commentator, there was one well that EPA had on its records, but DEP did not. EPA is unsure why this is. However, EPA and DEP have concurrent processes for permitting injection wells in Pennsylvania. Often EPA issues its permit before DEP issues the state permit and the lag time may account for the discrepancy. To the best of EPA's knowledge, Pennsylvania has permitted all disposal wells actively permitted under the federal UIC program or the State is currently in the permitting process for the well.

The same commentor also made a general comment criticizing EPA's FOIA responses, particularly in light of EPA's response to a second FOIA request by the same requestor regarding correspondence between Penneco and EPA relating to water supply complaints specific to the #3A well. The Region recognizes that it did not respond well to the commentor's request. Because of confusion on the Region's part about the request, the Region did not provide a timely response. The Region works to improve its responses to FOIA requests so that all our responses are timely. While this comment is outside the scope of matters under consideration for the permit, EPA welcomes any serious critiques of its FOIA responses. Any specific comments about Region 3's responses to FOIA requests for information can be addressed to Michael D'Andrea, Branch Chief of Region 3's FOIA Branch, phone number 215-814-5615.

COMMENT 15: Permitting the #4A well increases the likelihood of exposure to radon and the discharge of methane gas from drinking well water.

RESPONSE: Radon is a radioactive gas that forms naturally when uranium, thorium, or radium, which are radioactive metals break down in rocks, soil, and groundwater. Radon is the second leading cause of lung cancer in the United States today. The geologic formations that contain oil and gas deposits also contain naturally-occurring radionuclides such as radium, which are referred to as Naturally Occurring Radioactive Materials (NORM).

Methane is a colorless, odorless gas that is present in such geologic formations as the Marcellus Shale Formation. The gas can dissolve in water and escapes quickly to the air as a gas. It can build up in poorly ventilated areas and present the hazard of a fire or explosion if there is too much of it. Methane can also cause aesthetic issues with drinking water.

The measures that EPA requires to protect the mechanical integrity of the #4A well provides protection against contamination of the USDW by any contaminants in the injectate, including radium and methane. This prevents the exposure to radon gas, the possibility of a fire or explosion caused by methane, and the aesthetic issues caused by methane.

COMMENT 16: There are concerns about public health threats resulting from the injection well. These are a result of cancer-causing chemicals and radioactive material in the brine. There are concerns that the injection well endangers the drinking water supply of Plum Borough and surrounding areas and is a threat to the Allegheny River. There are concerns that USDWs and drinking water utilities will be compromised by well leaks and contamination from the well. One commentor was concerned about the possibility that the contaminants PFOA/PFAS were in the injected fluid. Several commenters noted that there are no treatment processes available to effectively remove hazardous chemicals that would contaminate drinking water as a result of permitting the well. Also, there was a comment that drinking water systems are already overburdened.

RESPONSE: The wastewater injected into the well is limited to fluids produced solely in association with oil and gas production, and the additives necessary to maintain the integrity of the injection well. Paragraph III.B.2 of the permit. This reflects the classification of the well as a Class II well. 40 C.F.R. § 144.6(b)(1). Hazardous fluids that are not the result of oil and gas production are prohibited from injection into Class II wells. The wells that inject this type of hazardous waste fluids below the lowermost USDW are classified as Class I wells and must the requirements for that class of well. 40 C.F.R. § 144.6(a). Other types of wells that inject hazardous waste are classified as Class IV and are prohibited or severely restricted. 40 C.F.R. §§ 144.6(d) and 144.13.

While the individual constituents within the fluids produced from an oil or gas operation may be toxic, hazardous, or radioactive, these fluids are exempt from hazardous waste regulation as a result of Congressional action and a determination by EPA. Such production wastes are not classified as hazardous under the Resource Conservation and Recovery Act (RCRA) and EPA lacks the authority to regulate the fluids as hazardous waste. Therefore, disposal of the fluids from oil

and gas production wells by using a Class II brine disposal injection well is legally permissible.

At the same time, while the fluids are not subject to hazardous waste regulation, the UIC Program must protect USDWs from contamination by the oil and gas related fluids. In addition, by providing a regulatory framework whereby the fluids can be safely managed, the Program seeks to prevent oil and gas fluids from discharging uncontrollably into a stream or a river, or from overflowing and/or seeping into the groundwater from above-ground containment pits.

Public and privately owned wastewater treatment facilities are unable to adequately remove many constituents found in brine, for example, chlorides and bromides. When these constituents are discharged to streams or rivers, they can pose serious risk to fish and other aquatic organisms living in the stream as well as contribute to serious health effects for people who obtain their drinking water from these streams and rivers. The UIC permitting program is designed to provide an alternative through which injection activities may occur in a regulated and environmentally protective manner which ensures that best management practices are identified and employed.

EPA seeks to fulfill the Program's mandate through UIC well requirements that include strict well construction criteria, monitoring and reporting requirements, and environmentally protective plugging and abandonment requirements. EPA also works to fulfill the Program's mandate by establishing testing criteria for well construction and well integrity. As a final measure, EPA also inspects injection well operations. Because of these measures, Region 3 does not anticipate that any USDW, the Allegheny River, or drinking water utilities will be compromised by permitting underground injection through this well.

COMMENT 17: One commenter requested clarification about what monitoring is planned for the site. In addition, commenters requested that testing procedures improve and that all chemicals used in the process be disclosed.

RESPONSE: Penneco will be responsible for continuously monitoring the injection well for surface injection pressure (pressure at which a fluid can be injected into the formation without causing a breakdown or fracture of the rock), annular pressure (pressure that builds up in the spaces between the injection string and the external casing), flow rate (volume of fluid which passes per unit of time) and cumulative volume

(running total of volume injected) from the date on which the injection well commences operation and until such date that the injection well is plugged and abandoned. Also, as discussed elsewhere, each load is tested for specific gravity. Further, the final permit requires that the injection well be equipped with automatic shut-off devices which would be activated in the event of a mechanical integrity failure. Finally, Paragraph II.D.3 of the permit requires Penneco to report to EPA, within twenty-four (24) hours, any permit noncompliance which may endanger, or which has endangered, human health or the environment.

As to which chemical constituents are in the injected fluid, 40 C.F.R. § 146.23(b)(1) requires the “monitoring of the nature of injected fluids at time intervals sufficiently frequent to yield data representative of their characteristics” by permittees. For this permit, it states in Paragraph II.C.3 that “The Permittee shall monitor the nature and composition of the injection fluid injected into the injection well by sampling, analyzing, and recording the injection fluid for the parameters listed below at the initiation of the injection operation and every two (2) years thereafter, or whenever the operator observes or anticipates a change in the injection fluid.” Paragraph II.C.3 of the permit also lists the testing parameters.

The testing parameters include pH, Total Dissolved Solids and Barium. In making a decision about which parameters must be sampled for monitoring, Section 146.23(b)(1) provides EPA Regions the discretion to require monitoring for the injection fluid constituents that they deem critical to protect underground sources of drinking water in their respective states or regions. Throughout the history of the Program, Region 3’s UIC Program has found that the testing parameters listed in the final permit are appropriate to characterize a Class II fluid. While the required testing parameters may not be as extensive as the commentors would want, the required parameters reflect not only some of the typical constituents found in the injection fluid, but also in shallow ground water. Should a ground water contamination event occur during the operation of the well, using these testing parameters, EPA will be able to compare samples collected from groundwater with the injection fluid analysis to help determine whether operation of the injection well may be the cause of the contamination.

The final requirement for monitoring required of Penneco is that it must submit an Annual Report to the EPA summarizing the results of the monitoring and testing activities required by the final permit, including monthly monitoring records of the injection fluid, the results of any mechanical integrity testing and information identifying any

major changes in the characteristics of the injected fluid. The Annual Report must be submitted to EPA by January 31 of each calendar year.

COMMENT 18: As a result of the holding in *County of Maui vs. Hawaii Wildlife Fund*, the #4A well is subject to the permitting requirements of the Federal Clean Water Act (CWA).

RESPONSE: In *County of Maui vs. Hawaii Wildlife Fund*, 140 S. Ct. 1462 (2020) (*Maui*), the specific issue before the U.S. Supreme Court was whether a wastewater treatment plant on the Island of Maui, Hawaii, needed a National Pollutant Discharge Elimination System (NPDES) permit for discharging pollutants into underground injection wells where, after injection, the pollutants traveled through groundwater to the Pacific Ocean. The County of Maui wastewater treatment plant uses UIC Class V injection wells to dispose of treated domestic and industrial sewage. Class V wells are generally relatively shallow wells and are used to inject nonhazardous fluids into or above USDWs. They can pose a risk to ground water quality if not properly managed.

The Court held that, an NPDES permit is required for a discharge of pollutants from a point source to surface waters that are “waters of the United States,” and for a discharge of pollutants from a point source that flows through groundwater before reaching a “water of the United States” where that discharge is the “functional equivalent” of a direct discharge. In *Maui*, the Court identified several factors that may prove relevant in determining whether a discharge of pollutants through groundwater is the functional equivalent of a direct discharge to surface waters and requires an NPDES permit. Two of the factors were (1) transit time, and (2) distance traveled. *Id.* at 1476-77. The Court stated that time and distance would be the most important factors in most cases, but not necessarily every case. *Id.* at 1477.

In contrast to the situation in *Maui*, the #4A well is a UIC Class II injection well that is used for the disposal of fluids associated with oil and gas production. Class II wells are considered deep injection wells, injecting into underground geologic formations thousands of feet below USDWs. Class II injection wells are designed and constructed to prevent vertical movement of fluid in order to protect USDWs and surface waters.

The final permit adheres to the UIC Regulations, found in 40 C.F.R. Parts 144, 146 and 147, which address subsurface injection activities and provide a regulatory scheme which ensure the occurrence

of thorough and proper siting, casing, monitoring and confinement activities that are protective of USDWs. Further, the wells are designed so that injection takes place in a geologic formation that limits the injected fluid's movement.

As described in the response to comment 2, for the #4A well, the injection zone for the well, the Murrysville Formation, is confined by rock formations above and below the injection zone. The upper and lower confining zones will prevent the injected fluid from reaching any USDW as well as any surface waters in the area such as the Allegheny River and Plum Creek. (There are also other geologic formations in the AOR, including at least two layers of shale, that may serve as barriers between the injection zone and the surface waters.)

As a result of the containment of the wastewater by the upper and lower confining zones, most likely it will be many years, if ever, before the wastewater would reach surface waters. Further, apart from having to reach a fissure in the confining zone, the injected fluid would also have to travel at minimum a vertical distance of at least 1,220 feet to even reach the Renton Mine, which might possibly serve as a conduit to ground water and eventually to surface water. EPA does not anticipate that the injected fluid will reach a fissure in the confining zone or travel the vertical distance of 1,220 feet to reach a mine. Because of the confinement of the injected fluid and the distance of the injection zone from surface waters, the *Maui* decision and the Federal CWA do not require that an NPDES permit be issued for the well.

Pennsylvania has several environmental laws that might affect the fluid injection. As noted in the response to comment 9, issuance of the final permit by EPA has no effect on Penneco's obligation to comply with State statutory and regulatory requirements and local ordinances as interpreted by state and local authorities.

COMMENT 19: Issuing an Underground Injection Control (UIC) Permit for the #4A well would violate 40 C.F.R. Part 141.

RESPONSE: The National Primary Drinking Water Regulations (NPDWR), 40 C.F.R. Part 141, are the legally enforceable primary drinking water standards under the Safe Drinking Water Act that apply solely to public water systems that supply drinking water to the public. Paragraph I.A of the permit provides in part that Penneco shall not allow underground injection activity, otherwise authorized by the final permit, to cause or contribute to the movement of fluid containing any contaminant(s) into any USDW, if the presence of the contaminant

may cause a violation of any primary drinking water regulation under 40 C.F.R. Part 141 or if it may otherwise adversely affect the health of any persons. The purpose of EPA's evaluation of the AOR, the requirements in the final permit to ensure the well's mechanical integrity, and other requirements in the final permit is to prevent the movement of fluid containing such contaminants that would cause a violation of Part 141 or otherwise adversely affect the health of any persons.

COMMENT 20: Issuing an Underground Injection Control (UIC) Permit for the #4A well would violate Article I, Section 27 of the Pennsylvania Constitution.

RESPONSE: EPA disagrees with the allegation that this permit issuance would violate the Pennsylvania Constitution's guarantee of access to "clean air, pure water, and to the preservation of the natural scenic, historic and esthetic values of the environment." UIC requirements and final permit conditions, as explained in the responses to comments 2 and 3, and elsewhere in this document, are designed to ensure non-endangerment of USDWs and to ensure that wastewater disposal operations can proceed in a manner that protects drinking water for local residents.

COMMENT 21: Issuing a UIC Permit for the #4A well would violate Pennsylvania's Clean Streams Law.

RESPONSE: To be more specific, according to the comment, the Clean Streams Law explicitly includes "underground water" as a part of the "waters of the Commonwealth" to be protected under the law. Additionally, the Clean Streams Law contains specific provisions relating to pollution resulting from underground wastewater disposal. The DEP is obligated to "consider the disposal of wastes . . . into the underground as potential pollution[.]" 25 Pa. Code § 91.51(a). Three types of underground discharges are prohibited:

- (1) Discharge of inadequately treated wastes, except coal fines, into the underground workings of active or abandoned mines.
- (2) Discharge of wastes into abandoned wells.
- (3) Disposal of wastes into underground horizons unless the disposal is for an abatement of pollution and the applicant

can show by the log of the strata penetrated and by the stratigraphic structure of the region that it is improbable that the disposal would be prejudicial to the public interest and is acceptable to the [Pennsylvania Department of Environmental Protection]. 25 Pa. Code § 91.51(b)

Further, according to the comment, because of abandoned coal mines in the area, there is an increased risk that leaking wastewater could flow into mines or abandoned wells, functionally behaving as a discharge violating 25 Pa. Code § 91.51(b)(1)-(2). The channels created by the mines and wells only increase the permeability of the geologic features meant to trap the wastewater underground, and thereby increase the risk of contamination. In addition, the UIC well also violates 25 Pa. Code § 91.51(b)(3), because it would place Plum Borough's streams and drinking water at risk of contamination by toxic and radioactive fracking brine and, as a result, would be prejudicial to the public interest.

EPA responds that UIC Permits issued by EPA are not subject to the requirements of the Clean Streams Law (Law). Compliance with a State statute such as the Law is not set out in 40 C.F.R. § 146.24 as a consideration for EPA when issuing a Class II permit.

Even if the final permit was subject to the Law, EPA responds that the operation of the well should not conflict with it. There should not be any effects on surface waters of streams or other bodies of water because of this permitting decision since the information Penneco submitted for the AOR surrounding the #4A well demonstrates that there are not any streams or surface water bodies, active or abandoned mines, or abandoned wells that could be affected by the injection well. See the response to comment 2 for a further explanation.

With regard to underground wastewater disposal regulated by the Law, based upon the geological data that Penneco has submitted, the information it has submitted about wells and mines in the Area of Review, and the requirements included in the final permit for construction and operation of the well, EPA's analysis is that injected fluids will be contained within the intended injection zone and discharges to active and abandoned mines plus to abandoned wells should not occur and therefore the well will comply with the intent of 25 Pa. Code §§ 91.51(b)(1) and (2). Further, the final permit requirements for construction and operation of the well should protect the streams and drinking water against contamination and therefore the well will

comply with the intent of 25 Pa. Code § 91.51(b)(3). See the response to comment 3 for a further explanation.

COMMENT 22: Other comments on the permit included the following reasons to not issue the permit: It would increase noise pollution and truck traffic and also cause road degradation. It would decrease property values. It would site an industrial facility in a residential area. It would generate foul smells from the injection facility. The well is too close to residential areas and EPA/the operator should consider alternative, safer sites. The well would have negative impacts on local businesses. It would create the possibility of surface spills from the trucks bringing fluids to the well. It is irresponsible to allow any permit that encourages extractive activity and fossil fuel emissions. Issuing an Underground Injection Control (UIC) Permit for the #4A well would violate the Clean Air Act. EPA is bowing to the company's search for profits. Finally, the oil and gas industry wanted to site injection wells in Pennsylvania in order to avoid the costs of recycling and shipping waste to Ohio and other sites.

RESPONSE: EPA first notes that the permit application did include the facility's preparedness, prevention, and contingency plan which documents measures that Penneco must take to prevent and control surface spills. Such measures include pressure valves to prevent spills and secondary containment. However, this plan is required by state law and is not required by the Federal UIC Program. Because this is not required by the Federal UIC Program, EPA does not review the plan in its evaluation of the permit application.

EPA acknowledges and understands commenters' concerns regarding the effects of issuing an injection well permit. However, EPA's UIC jurisdiction under the Safe Drinking Water Act is limited to determining whether the proposed injection operation will safely protect USDWs from the subsurface emplacement of fluids and a determination that the injection operation, as proposed, will be compliant with all federal UIC regulations. 40 C.F.R. § 146.24. Therefore, these concerns are outside of the scope of the UIC Program.

Because the legal effect of issuing the final permit for the well is limited in scope, a permittee may have to obtain several other authorizations before it is allowed to commence construction and/or operation. The commenters' concerns might be addressed by the authorizations required by these other laws. To repeat an earlier

point, issuance of the final permit does not affect Penneco's obligation to comply with State and local legal requirements.

COMMENT 23: Several commentors referenced published news articles, studies, or reports to support their comments on the draft permit.

RESPONSE: Based upon a review of these materials, EPA has several responses. First, some materials were mainly a critique of the issues presented by using wells to hydraulic fracture geologic formations for oil and gas production rather than a critique of using wells for wastewater injection. Such critiques fall outside of the issues the UIC rules set out for consideration by EPA when it issues a permit.

Some published materials described issues that do not apply to the #4A well permit. Other materials did not provide enough information about a situation for EPA to know if the situation was analogous to the circumstances of this permit. For other materials, access to the material required accepting tracking markers. Therefore, EPA need not respond or cannot respond to the materials.

Some published materials described issues that, while they may apply to the #4A well permit, fall outside of those matters the UIC rules set out for consideration by EPA when it issues a UIC permit. Therefore, EPA need not respond to them.

Finally, some materials were critiques of the issues presented by this type of Class II injection well. EPA responds that it understands that there are risks inherent in disposing of the wastewater by underground injection. The Agency has made the judgement that the risks and problems associated with other potential means for disposing of the wastewater makes underground injection the preferable option. The UIC Program's requirements for these wells promote their mechanical integrity and lessen the risks. Also, this Response to Comments document provides specific responses to some of the issues discussed in the materials.

COMMENT 24: EPA did not allow enough time to comment on the draft permit. Also, holding a virtual public hearing instead of in-person hearing discouraged some interested parties from providing comments.

RESPONSE: As noted in initial paragraph of this Response to Comments document, on May 26, 2022, the EPA issued a public notice

requesting comments on the draft permit for the well and provided the opportunity to request a public hearing to take comments on the permit. After receiving numerous requests to hold a hearing, on June 28, 2022, EPA held a virtual public hearing to receive comments. In response, a number of commentors objected to the length of time allowed for public comments and the virtual nature of the hearing. As a result of the objections, EPA held an in-person public hearing on August 30, 2022. EPA also extended the period for taking public comment until September 7, 2022. As result of holding an in-person hearing and extending the public comment period, EPA thinks it has satisfactorily addressed the objections.

Federal Underground Injection Control Program Permit Appeals Procedures

The provisions governing procedures for the appeal of an EPA UIC permit are specified at 40 C.F.R. § 124.19. Any person who commented on the draft permit can appeal the final permit by filing a written petition for review with the Clerk of the EPA Environmental Appeals Board (EAB).

A petition for review must be filed within thirty (30) days of the date of the notice announcing EPA's decision. This means that the EAB must receive the petition within 30 days. All parties and other interested persons are encouraged to file documents with the Board by using the EAB's Electronic Filing System which is accessible on the Board's website at www.epa.gov/eab. See the EAB website for further information on how to file with the EAB electronically, [EPA Environmental Appeals Board | US EPA](http://www.epa.gov/eab).

The rule requires petitioners to send a copy of the petition to the EPA Regional Administrator and the permit applicant. For the Regional Administrator, send the petition to the following address:

Regional Administrator
EPA Region 3
3RA00
4 Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, PA 19103-2852

In addition, send an email copy of the petition to the Source Water & UIC Section (3WD22) using the following email address:
R3_UIC_Mailbox@epa.gov.

Filing documents by U.S. mail or hand delivery or courier (including delivery by a commercial delivery service) is also permissible. Documents sent through the U.S. Postal Service (except by U.S. Express Mail) to the Clerk of the Board are to be addressed to the EAB's mailing address:

Clerk of the Board
U.S. Environmental Protection Agency
Environmental Appeals Board
1200 Pennsylvania Avenue, N.W.
Mail Code 1103M
Washington, D.C. 20460-0001

Documents delivered in person by courier or otherwise (including delivery by U.S. Express Mail or a by commercial delivery service) are to be sent to the EAB's hand-delivery address:

Clerk of the Board
U.S. Environmental Protection Agency
Environmental Appeals Board
WJC East Building
1201 Constitution Avenue, N.W., Room 3332
Washington, D.C. 20004

Note that pursuant to an order issued by the EAB on September 21, 2020, Revised Order Authorizing Electronic Service of Documents in Permit and Enforcement Appeals, the EAB authorized parties to all newly filed permit and enforcement appeals to utilize email to fulfill their service obligations under 40 C.F.R. §§ 22.5(b) and 124.19(i)3(ii). Thus, a party need not seek and obtain consent of another party in order to serve that party by email. Parties must promptly file notices informing the Board and the other parties of any changes in their email addresses.

The petition must clearly set forth the petitioner's contentions for why the EAB should review the permit. The petition must identify the contested permit conditions or the specific challenge to the permit decision. The petitioner must demonstrate the issues raised in the petition had been raised previously during the comment period. The

petitioner must also state whether, in his or her opinion, the permit decision or the permit's conditions appealed are objectionable because of:

1. Factual or legal error, or
2. The incorporation of a policy consideration which the EAB should, at its discretion, review.

If a petition for review of this permit is filed, the permit would be deemed not to be in effect pending a final agency action.

After review of the Appeals Petition, the EAB will either grant or deny the appeal. The EAB will decide the appeal on the basis of the written briefs and the total administrative record of the permit action. If the EAB denies the petition, EPA will notify the petitioner of the final permit decision. The petitioner may, thereafter, challenge the permit decision in Federal Court. If the EAB grants the appeal, it may direct the Region 3 office to implement its decision by permit issuance, modification, or denial. The EAB may order all or part of the permit decision back to the EPA Region 3 office for reconsideration. In either case, if the permit is appealed, a final agency decision occurs when after appeal the permit is issued, modified, or denied and an Agency decision is announced. After this time, all administrative appeals have been exhausted, and any further challenges to the permit decision must be made to Federal Court.