# IN RE FLORENCE COPPER, INC.

UIC Appeal Nos. 17-01 & 17-03

## *ORDER DENYING REVIEW*

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Decided September 22, 2017

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Syllabus

The U.S. Environmental Protection Agency ("EPA") Region 9 ("Region") issued an Underground Injection Control ("UIC") permit to Florence Copper, Inc., authorizing the company to construct and operate a Production Test Facility in Pinal County, Arizona. The Permit, issued under the Safe Drinking Water Act ("SDWA"), authorizes Florence Copper to engage in in-situ copper mining at the Production Test Facility, which involves drilling wells and injecting acid into copper ore deposits for the purpose of copper recovery and production testing.

The Production Test Facility's well field is located within the boundary of a UIC permit that the Region issued in 1997 to BHP Copper Inc. ("BHP"), authorizing BHP to operate an in-situ copper recovery facility. At the same time the Region issued BHP the 1997 permit, the Region also granted an aquifer exemption pursuant to 40 C.F.R. § 146.4.

The Town of Florence and SWVP-GTIS MR, LLC (collectively, "Town of Florence" or "Town") (UIC Appeal No. 17-03) and Mr. John L. Anderson (UIC Appeal No. 17-01) timely filed with the Board petitions for review of the Region's permit decision.

The Town's Petition is based on one overarching contention: namely, that the Region clearly erred, abused its discretion, or made inappropriate policy choices when the Region relied on the 1997 aquifer exemption in issuing the Permit. The Town maintains that land uses and local zoning regulations have "changed dramatically" since issuance of the 1997 aquifer exemption and, as a consequence, the contours of the Exemption are "based on circumstances that no longer exist." The Town contends that the Region should have rescinded or revoked the 1997 aquifer exemption and prepared a new aquifer exemption specifically tailored to the small scope of Florence Copper's Production Test Facility.

Mr. Anderson's Petition essentially raises three general concerns: (1) sources of drinking water will not be adequately protected from migrating mining-related fluids; (2) aquifers cannot be successfully restored after in-situ mining activities; and (3) any one of the "cons" identified in an article published by the Arizona Geological Survey summarizing the use of solution mining for copper extraction justify denying the Permit.

Held: The Board denies both petitions for review.

Town of Florence Petition (UIC Appeal No. 17-03)

The Board holds that it is not the proper forum to resolve the Town's aquifer exemption-related arguments because aquifer exemption decisions are discrete final agency actions that are not themselves UIC permitting decisions or elements thereof within the meaning of 40 C.F.R. § 124.19(a), are separately operable from any UIC permit, and, under the SDWA, must be challenged in the appropriate federal circuit court of appeals within forty-five days or later if based solely on grounds arising after that deadline. The Board therefore denies review of the Town's Petition.

Mr. Anderson Petition (UIC Appeal No. 17-01)

The Board observes that it appreciates Mr. Anderson's concerns about potential impacts to drinking water sources, but holds that Mr. Anderson's Petition does not satisfy threshold procedural requirements necessary to support Board review. The Board finds that, as to each of the three general concerns expressed by Mr. Anderson, the Petition fails to indicate whether or how these concerns apply to, or are not addressed by, the Permit, the Region's response to comments, or the Administrative Record. The Board therefore concludes that Mr. Anderson's Petition fails to provide a sufficient basis on which to consider whether review is warranted. The Board further explains why, even if it were to consider Mr. Anderson's three general concerns on the merits, it would conclude that Mr. Anderson's Petition fails to demonstrate any clearly erroneous finding of fact or conclusion of law, abuse of discretion, or other issue warranting review.

***Before Environmental Appeals Judges Aaron P. Avila, Mary Kay Lynch, and Mary Beth Ward.***

***Opinion of the Board by Judge Avila:***

## I. *STATEMENT OF THE CASE*

The U.S. Environmental Protection Agency ("EPA" or "Agency") Region 9 ("Region") issued an Underground Injection Control ("UIC") permit to Florence Copper, Inc., authorizing the company to construct and operate a Class III injection well Production Test Facility in Pinal County, Arizona. *See* EPA Region 9, *Underground Injection Control Program Area Permit, Class III In-Situ Production of Copper, Permit No. R9UIC-AZ3-FY11-1, Florence Copper Project* (Dec. 20, 2016) (Administrative Record ("A.R.") #596) ("Permit" or "Final Permit").[1] The Permit authorizes Florence Copper to engage in in-situ copper mining at the Production Test Facility, which involves drilling wells and injecting acid into

[1] The Region filed a Certified Index to the Administrative Record, along with portions of the Administrative Record itself. In this Order, the Environmental Appeals Board refers to documents in the Administrative Record by their title and the document number assigned to them in the Region's Certified Index.

copper ore deposits for the purpose of copper recovery and production testing. *Id*. at 6. The Region issued the Permit and authorized Florence Copper to construct, test, and inject for a period to include the Production Test Facility's approximate two-year operational life and five-year post-closure monitoring period. *Id*. at 6-7. The Region included in the Permit conditions addressing, among other things, pre-drilling requirements, well construction, operation, maintenance, monitoring, reporting, aquifer restoration, closure, abandonment, and financial responsibility. *See* EPA Region 9, *Statement of Basis, Draft Class III Underground Injection Control Area Permit for Florence Copper, Inc., Permit Number R9UIC-AZ3-FY11-1*, at 7-12 (Dec. 7, 2014) (A.R. #18) ("Statement of Basis"); Permit conds. II-III, at 8-46.

Mr. John L. Anderson (UIC Appeal No. 17-01) and the Town of Florence and SWVP-GTIS MR, LLC (collectively, "Town of Florence" or "Town") (UIC Appeal No. 17-03) timely filed with the Environmental Appeals Board ("Board") petitions for review of the Region's permit decision.[2] The Board held oral

[2] The Board previously disposed of two other petitions for review filed with the Board challenging the Region's permit decision. Ms. Karen J. Wall (UIC Appeal No. 17-04) filed a petition for review with the Board on February 7, 2017. On February 10, 2017, Florence Copper filed a motion for "denial" of Ms. Wall's petition on the ground that it was untimely. Two weeks later, Florence Copper filed a document entitled "Completion of Florence Copper, Inc.'s Service of Motion to Dismiss Upon Karen J. Wall" in which Florence Copper represented that Ms. Wall was served a copy of Florence Copper's motion "no later than February 16, 2017." To avoid any confusion as to the deadline for responding to Florence Copper's motion, the Board issued an order providing that any party intending to file a response to Florence Copper's motion had to do so on or before March 14, 2017. *In re Florence Copper, Inc.*, UIC Appeal No. 17-04, at 2-3 (EAB Mar. 3, 2017) (Order Setting Deadline for Response to Motion, Staying Response to Petition, and Denying Motion for Extension of Time to File Response). Ms. Wall did not file any response to Florence Copper's motion, and the Board dismissed Ms. Wall's petition as untimely. *In re Florence Copper, Inc.*, UIC Appeal No. 17-04, at 2-3 (EAB Mar. 22, 2017) (Order Dismissing Petition for Review as Untimely).

The Gila River Indian Community ("Community") (UIC Appeal No. 17-02) filed a petition for review on January 19, 2017. On July 25, 2017, the Community filed a motion to dismiss its appeal pursuant to 40 C.F.R. § 124.19(k) because the Community had reached a settlement with Florence Copper. The Board granted the Community's motion and dismissed the petition with prejudice. *In re Florence Copper, Inc.*, UIC Appeal No. 17-02 (EAB July 26, 2017) (Order Dismissing Petition for Review).

argument on the two petitions on July 27, 2017. For the reasons stated below, the Board denies the petitions for review.

## II. *PRINCIPLES GOVERNING BOARD REVIEW*

Section 124.19 of Title 40 of the Code of Federal Regulations governs Board review of a UIC permit.[3] In considering any petition filed under 40 C.F.R. § 124.19(a), the Board first evaluates whether the petitioner has met threshold procedural requirements such as timeliness, standing, issue preservation, and specificity. 40 C.F.R. § 124.19(a)(2)-(4); *see also In re Seneca Res. Corp.*, 16 E.A.D. 411, 412 (EAB 2014). If the Board concludes that a petitioner satisfies those threshold pleading obligations, then the Board evaluates the merits of the petition for review. *See Seneca Res.*, 16 E.A.D. at 412. If a petitioner fails to meet a threshold requirement, the Board typically denies or dismisses the petition for review. *See, e.g., id.* at 413-16.

In any appeal from a permit decision issued under part 124, the petitioner bears the burden of demonstrating that review is warranted. *See* 40 C.F.R. § 124.19(a)(4). Under 40 C.F.R. § 124.19, the Board has discretion to grant or deny review of a permit decision. *See In re Archer Daniels Midland Co.*, 17 E.A.D. 380, 383 (EAB 2017). The Board ordinarily denies review of a permit decision (and thus does not remand it) unless the petitioner demonstrates that the permit decision is based on a clearly erroneous finding of fact or conclusion of law, or involves a matter of policy or exercise of discretion that warrants review. 40 C.F.R. § 124.19(a)(4)(i)(A)-(B); *see, e.g.*, *In re La Paloma Energy Ctr., LLC*, 16 E.A.D. 267, 269 (EAB 2014). To meet that standard, it is not enough for a petitioner to rely on previous statements of its objections during the administrative process leading up to the issuance of the permit, such as comments on a draft permit. A petitioner must demonstrate why the permit issuer's response to those objections

[3] EPA revised the rules governing appeals from permit decisions, effective May 22, 2017. *See* Procedures for Decisionmaking, 82 Fed. Reg. 2230, 2236-37 (Jan. 9, 2017) (revising 40 C.F.R. §§ 124.19-.20); *see also* Further Delay of Effective Dates for Five Final Regulations Published by the Environmental Protection Agency Between December 12, 2016 and January 17, 2017, 82 Fed. Reg. 14,324, 14,324-25 (Mar. 20, 2017) (extending effective date of rule revision to May 22, 2017). These amendments are procedural in nature and do not substantively alter the Agency's review of permit appeals. *See* 82 Fed. Reg. at 2230-31. Additionally, the revised rules apply only to filings submitted after the effective date of the rule, May 22, 2017, and thus do not apply to any relevant filings in this matter.

(the permit issuer's basis for its decision) is clearly erroneous or otherwise warrants review. *See In re Beeland Grp., LLC*, 14 E.A.D. 189, 196 (EAB 2008). A petitioner bears that burden even when not represented by legal counsel, as is the case here with Mr. Anderson. *See Archer Daniels Midland*, 17 E.A.D. at 383. And while the Board does not expect petitions filed by those unrepresented by legal counsel "to contain sophisticated legal arguments or to employ precise technical or legal terms," the Board nevertheless "does expect such petitions to provide sufficient specificity to apprise the Board of the issues being raised." *In re Sutter Power Plant*, 8 E.A.D. 680, 687-88 (EAB 1999). The Board also expects such petitions "to articulate some supportable reason or reasons as to why the permitting authority erred or why review is otherwise warranted." *Id.* at 688. With those principles in mind, the Board next summarizes the relevant legal and factual background and then considers the two petitions for review.

## III. *LEGAL AND FACTUAL BACKGROUND*

### A. *The UIC Program*

In the Safe Drinking Water Act ("SDWA"), Congress required the EPA Administrator to promulgate regulations for state underground injection control programs to protect underground sources of drinking water ("USDWs"). SDWA § 1421, 42 U.S.C. § 300h. EPA promulgated such regulations at 40 C.F.R. parts 144 through 148, including minimum requirements for UIC permits. *See* 40 C.F.R. pt. 145. EPA administers the UIC program in those states that, like Arizona, are not yet authorized to administer their own programs. *See id.* §§ 144.1(e), 147.151.[4]

The UIC program focuses on protection of underground water that "supplies or can reasonably be expected to supply any public water system." SDWA § 1421(d)(2), 42 U.S.C. § 300h(d)(2); *see also In re Envtl. Disp. Sys., Inc.*, 14 E.A.D. 96, 99 n.4 (EAB 2008). The purpose of the UIC regulations is to prevent the movement of fluids containing contaminants into USDWs if the presence of those contaminants may cause a violation of a primary drinking water regulation or

[4] The UIC regulations use the term "Director" to describe the permitting authority. 40 C.F.R. § 146.3 (defining "Director"). The permitting authority here is EPA's Regional Administrator for Region 9. The Board will therefore refer to the "permitting authority," "permit issuer," or the Region, as appropriate, in places where the regulations use the term "Director." *See id.* ("When there is no approved State * * * program, and there is an EPA administered program, 'Director' means the Regional Administrator.").

otherwise adversely affect human health. *See* 40 C.F.R. § 144.12(a). "[A]ll injection activities including construction of an injection well are prohibited until the owner or operator is authorized by permit." *Id.* § 144.31(a). Injection wells fall into six classes. *Id.* § 144.6. Class III wells, which are at issue here, are used to inject fluids for extraction of minerals, including "[i]n situ production of uranium or other metals * * * from ore bodies which have not been conventionally mined." *Id.* § 144.6(c)(2).

As part of analyzing the movement of fluids containing containments and protecting USDWs, the Agency identifies an "area of review" (also known as the "zone of endangering influence"). As relevant here, the area of review denotes the area surrounding injection wells in which the pressures in the injection zone may cause migration of the injection or geological formation fluids out of the injection zone and into a USDW. *See id.* § 146.6(a)(1)(ii).

A USDW is "an aquifer or its portion" that: (1) supplies or contains a sufficient quantity of groundwater to supply a public water system; (2) contains less than 10,000 milligrams per liter of total dissolved solids; and (3) is not an "exempted aquifer." *Id.* §§ 144.3, 146.3. An "aquifer" is a "geological 'formation,' group of formations, or part of a formation that is capable of yielding a significant amount of water to a well or spring." *Id.* §§ 144.3, 146.3. An aquifer or a portion thereof that meets the regulatory criteria for a USDW may be determined to be an "exempted aquifer" (and therefore no longer considered a USDW within the meaning of the SDWA) if:

> (a) It does not currently serve as a source of drinking water; and
>
> (b) It cannot now and will not in the future serve as a source of drinking water because: * * * [i]t * * * can be demonstrated by a permit applicant as part of a permit application for a Class * * * III operation to contain minerals * * * that[,] considering their quantity and location[,] are expected to be commercially producible.

*Id.* § 146.4(a)-(b)(1).

B. *Factual Background*

To better understand the concerns underlying the petitions for review pending with the Board, some background regarding the Production Test Facility's location – and in particular, the underlying water-saturated geologic formations – is helpful.

1. *Geologic Formations Underlying the Production Test Facility*

Florence Copper's Production Test Facility includes a 2.2-acre field of wells that will inject a dilute sulfuric acid-based solution into a saturated ore body referred to as the Oxide Bedrock Zone for the purpose of copper recovery and production testing. Permit at 6 & app. A fig.S-2; Statement of Basis at 6. The Oxide Bedrock Zone is located between 450 and 1,200 feet below ground surface. Statement of Basis at 6. Two additional water-saturated geologic formations are located between the Oxide Bedrock Zone and the ground's surface – the Lower Basin Fill Unit and the Upper Basin Fill Unit. The Lower Basin Fill Unit is located immediately above the Oxide Bedrock Zone, and the two are directly connected hydrologically, with no impermeable barrier between them. *See id.* at 6, 12; EPA Region 9, *Florence Copper Production Test Facility (PTF) Class III In-Situ Production of Copper Permit No. R9UIC-AZ3-FY11-1, Response to Comments* ¶ 17, at 7 (Dec. 20, 2016) (A.R. #581) ("Response to Comments"). The Upper Basin Fill Unit is located above the Lower Basin Fill Unit, and those two units are separated by the Middle Fine-Grained Unit, a thin clay layer that restricts water flow between the two units. *See* Statement of Basis at 6.

2. *The Production Test Facility and Its Relationship to a Prior UIC Permit*

The Production Test Facility's 2.2-acre well field is located within the more than 200-acre mining boundary of a Class III UIC permit previously issued by the Region to an entity called BHP Copper Inc. ("BHP"). EPA Region 9, *Statement of Basis for a Draft Permit and Proposed Aquifer Exemption, BHP Florence Project* 5, 7 (Feb. 1997) (A.R. #238) ("BHP Permit Statement of Basis"); Statement of Basis at 12-13; *see* EPA Region 9, *Underground Injection Control Program Area Permit, BHP Copper Florence Project, Permit No. AZ396000001* (May 1, 1997) (A.R. #23) ("BHP Permit").

Specifically, in 1997, the Region issued a UIC permit to BHP authorizing BHP to operate an in-situ copper recovery facility, with an over 200-acre mining boundary. *See* BHP Permit Statement of Basis at 5, 7; Statement of Basis at 2, 12-13; *see generally* BHP Permit. At the same time the Region issued BHP the 1997 permit, the Region also granted an aquifer exemption. EPA Region 9, *Underground Injection Control Aquifer Exemption for EPA Permit #AZ396000001* (May 1, 1997) (A.R. #24) ("1997 Aquifer Exemption" or "Exemption"). The Region specified the upper boundary of the Exemption as 200 feet above the Oxide Bedrock Zone, or the base of the Middle Fine-Grained Unit, whichever is further below the ground's surface. 1997 Aquifer Exemption at 1; Statement of Basis at

12. The lower boundary of the Exemption is defined as "the base of the reactive interval amenable to copper leach solutions, encompassing the oxide zone, which contains an economical amount of copper, and copper in the [underlying] sulfide zone that is leachable." 1997 Aquifer Exemption at 1. The outer lateral boundary of the Exemption is a 500-foot circumscribed area around the mining boundary of BHP's 1997 permit. *See id*. at 1-3; Statement of Basis at 12-13.

The Region determined that the subsurface area within the Exemption's boundaries met the factual criteria for designation as an exempted aquifer because the area did not currently serve as a source of drinking water and would not serve as a drinking water source in the future because it contained commercially producible quantities of copper. *See* Statement of Basis at 12-13; *see also* 40 C.F.R. § 146.4(a), (b)(1). The 1997 Aquifer Exemption specifies that "[t]his aquifer exemption has no expiration date." 1997 Aquifer Exemption at 3.

Under the 1997 permit, BHP drilled into the oxide ore deposits four Class III injection wells, nine recovery wells, and seven observation wells. Statement of Basis at 2. BHP then conducted a 105-day pilot project to demonstrate hydraulic control and gather copper recovery and other technical data for its final feasibility analysis. *Id*.; Response to Comments ¶ 1, at 6; M3 Eng'g & Tech. Corp., *Florence Copper Project: NI 43-101 Technical Report Pre-Feasibility Study* 7 (Apr. 4, 2013) (A.R. #8) ("2013 Pre-Feasibility Study"); *see* BHP Permit cond. II.F.7, at 19 (requiring minimum 90-day hydraulic control demonstration). Based in part on the pilot project results, BHP decided in 1998 to defer developing a full-scale copper recovery facility. *See* Statement of Basis at 2; 2013 Pre-Feasibility Study at 7. The Agency approved closure of the BHP well field in 2005 after rinsing operations were concluded in 2004. Response to Comments ¶ 46, at 33.

3. *Florence Copper's Permit for the Production Test Facility*

In March 2011, after acquiring portions of former BHP lands, including the Production Test Facility property at issue in this matter, Florence Copper submitted to the Region an application for a Class III UIC permit to amend and transfer to Florence Copper the 1997 permit issued to BHP. *See* Statement of Basis at 2. The Region declined to transfer the existing permit given the lengthy time period between issuance of the 1997 permit and Florence Copper's 2011 application. *Id.* The Region instead determined that it was appropriate to revoke the 1997 permit

and require Florence Copper to submit an application for reissuance.[5] *Id.* In response, Florence Copper submitted a revised permit application seeking authorization to construct and operate a pilot-scale in-situ copper recovery facility, i.e., the Production Test Facility. *Id*.; *see* Florence Copper, Inc., *Florence Copper Project: Underground Injection Control Permit Application* (rev. Oct. 6, 2014) (A.R. #2) ("Permit Appl.").

The Region issued a draft permit in December 2014, authorizing Florence Copper to construct, test, and inject at the site for a period of up to seven years, including a two-year Production Test Facility operational life and a five-year post-closure monitoring period. EPA Region 9, *Underground Injection Control Program Draft Area Permit, Class III In-Situ Production of Copper, Permit No. R9UIC-AZ3-FY11-1, Florence Copper Project* 7 (Dec. 2014) (A.R. # 17) ("Draft Permit"); Statement of Basis at 2-3. The Region held a public hearing on January 22, 2015, pursuant to 40 C.F.R. § 124.12, and allowed approximately four months for public comment (through April 13, 2015) because of significant public interest. *See generally* EPA Region 9, *Amended Public Notice of Intent to Issue a Class III Underground Injection Control Area Permit for Florence Copper, Inc.* (Jan. 13, 2015) (A.R. #21) (extending public comment period through March 16, 2015); EPA Region 9, *Amended Public Notice of Intent to Issue a Class III Underground Injection Control Area Permit for Florence Copper, Inc.* (Mar. 12, 2015) (A.R. #22) (further extending public comment period through April 13, 2015).

The Region issued the Final Permit on December 20, 2016, along with its response to public comments. *See generally* Permit; Response to Comments. The Permit authorizes Florence Copper to inject a dilute sulfuric acid-based solution into the copper ore deposits underlying the Production Test Facility at depths greater than forty feet below the top of the Oxide Bedrock Zone. Permit cond. II.C.7, at 14; Statement of Basis at 6. The acid will solubilize copper oxide minerals in the bedrock, and the copper-laden solution will be pumped back to the surface, where copper will be extracted using a solvent extraction/electrowinning process. Statement of Basis at 6. Under the Permit, the Production Test Facility's 2.2-acre well field includes four injection wells, nine recovery wells, seven observation wells, and four multi-level sampling wells. *Id*.; Permit app. A fig.P-1. Those wells

[5] UIC permits may be "modified, revoked and reissued, or terminated either at the request of any interested person (including the permittee) or upon the [Region's] initiative" for specified reasons. 40 C.F.R. § 124.5(a); *see also id.* § 144.39.

are arranged as follows: the four injection wells are surrounded by eight recovery wells (the ninth recovery well is located in the middle of the four injection wells); the four multi-level sampling wells are surrounded by the four injection wells; and the seven observations are aligned along the perimeter of the 2.2-acre well field. In addition to the earlier-mentioned wells, the Permit also requires eight water quality monitoring wells to detect any degradation of water quality and ensure that water quality is maintained at the required levels during the post-closure monitoring period. Statement of Basis at 6; *see* Permit cond. II.F.1, at 23.

The Region concluded that Florence Copper had demonstrated, and the Region adopted, an area of review comprised of the Production Test Facility's 2.2-acre well field plus a 500-foot-wide area circumscribing the well field. *See* Response to Comments ¶ 18, at 18; Permit cond. I, at 6; Statement of Basis at 6-7. The Region determined that the area of review is conservative with respect to protecting USDWs because the 500-foot buffer is 7.5 times the actual lateral distance injection fluids may migrate during the maximum permissible loss of hydraulic control of forty-eight hours. Response to Comments ¶ 18, at 18. The Region also determined that the 500-foot buffer provides a safety factor of 2.5-to-4 times the actual distance that fluids may migrate under a worst-case thirty-day loss of hydraulic control. *Id.*

The Region noted that the Production Test Facility's area of review is a "relatively small lateral area well within the boundaries of the existing [i.e., 1997] aquifer exemption." Statement of Basis at 13. In addition, the Region found that Florence Copper had demonstrated that "the injection and in-situ copper recovery fluids [for Production Test Facility] operations will remain within the [area of review], and thus well within the previously approved aquifer exemption." *Id.* Even though the 1997 Aquifer Exemption remains in effect, the Region also reviewed whether the portion of the exempted aquifer that would be affected by operation of the Production Test Facility continues to meet the factual criteria for granting an aquifer exemption. *Id.* The Region concluded that the portion of the exempted aquifer that would be affected by operation of the Production Test Facility continues to meet the factual criteria for an aquifer exemption because: (1) it does not currently serve as a source of drinking water and (2) it cannot and will not in the future serve as a source of drinking water because it contains minerals that are expected to be commercially producible. *Id.* at 13-14.

Notably, the Permit contains a number of terms and conditions designed to ensure that injected fluids do not migrate (i.e., that hydraulic control is maintained) beyond the Production Test Facility's well field (which is considerably smaller than

the 1997 Aquifer Exemption) or into the Lower Basin Fill Unit. *See, e.g.*, Response to Comments ¶ 4, at 9 ("fluids will not migrate beyond the Production Test Facility's well field as long as hydraulic control is maintained"). For example, the placement of the injection and recovery wells as well as the pump and extraction rates for the wells required by the Permit are designed to maintain an inward hydraulic gradient, thereby preventing migration of injected fluids outside the Production Test Facility's well field. *See* Statement of Basis at 7, 9; Response to Comments ¶ 6, at 11; Permit conds. II.E.1.a, .d, at 16-17. In addition, the Permit requires that Florence Copper monitor hydraulic control by comparing groundwater levels in the recovery wells and the observation wells that are located around the perimeter of the well field to ensure that an inward gradient is maintained and hence injected fluids remain within the Production Test Facility's well field. Statement of Basis at 7, 9; *see also* Response to Comments ¶ 27, at 24; Permit conds. II.E.1.b, .d, at 17. The Permit also requires that Florence Copper monitor groundwater electrical conductivity as another means of verifying that hydraulic control is maintained and fluid migration to the Lower Basin Fill Unit does not occur. Specifically, if acid and sulfate levels increase at an observation well, electrical conductivity readings will increase, thus indicating the presence of injected fluids (and a loss of hydraulic control) and triggering contingency actions to prevent migration of fluids. Statement of Basis at 7, 9; Response to Comments at 3 & ¶¶ 7-10, 24, at 11-13, 22; Permit conds. II.C.6.d, II.E.1.c, .d, at 14, 17. Lastly, the Permit excludes the uppermost forty feet of the Oxide Bedrock Zone from injection as an additional means of preventing vertical migration of injected fluids. Permit cond. II.C.7, at 14; Statement of Basis at 7.

The water quality monitoring wells required by the Permit provide additional protection that injected fluids will not migrate outside the area of review or into the Lower Basin Fill Unit. Specifically, under the Permit, eight monitoring wells located outside the Production Test Facility's well field, but within the area of review, will measure water quality in the Oxide Bedrock Zone, the Lower Basin Fill Unit, and the Upper Basin Fill Unit. *See* Permit cond. II.F.1, at 23; Permit Appl. attach. P fig.P-1 & tbl.P-2. Those monitoring wells provide an additional means of ensuring that fluids remain where envisioned by the Permit – within the area of review, if not within the Production Test Facility's well field itself.[6]

[6] The Permit includes actions that Florence Copper must take in the event that indicators show hydraulic control has been lost or monitoring wells reveal an exceedance of water quality parameters established under the Permit. *See* Permit conds. II.H.1-.2, at 34-37; *see infra* Part IV.B.3.a.

After Florence Copper completes its injection activities and before the Agency will authorize closure of the well field, the Permit requires rinsing and aquifer restoration to ensure compliance with maximum contaminant levels ("MCLs") under the SDWA, 42 U.S.C. §§ 300f to 300j-26,[7] or with preoperational background levels for all constituents (whichever is more stringent). *See* Permit cond. II.I, at 27-39; *see also* Response to Comments ¶¶ 5, 19-20, at 10, 19. The Permit also requires five years of post-closure monitoring, which may be extended beyond five years if EPA deems it necessary to ensure adequate protection of USDWs. *See* Permit cond. II.I, at 7; *see also* Response to Comments ¶ 20, at 19.

Finally, the Permit specifies that Florence Copper must "ensure that there is no migration of injection fluids, process by-products, or formation fluids beyond the exempted zone described at Part II, Section B.1 [of the Permit] and delineated in the existing Aquifer Exemption in Appendix A" of the Permit during the expected two-year life of the Production Test Facility and five-year closure period. Permit cond. II.B.2, at 9. That is, Florence Copper must ensure that no migration of fluids occurs beyond the boundaries of the 1997 Aquifer Exemption, thereby protecting USDWs. *See* Permit conds. II.B.1.a-.b, at 8-9. Thus, while Florence Copper's primary obligation under the Permit is to ensure that fluids do not migrate outside the area of review, the Permit includes the additional proviso that Florence Copper ensure that no migration of injection fluids, process by-products, or formation fluids occurs beyond the boundaries of the 1997 Aquifer Exemption (thereby ensuring no impacts to USDWs).

## IV. *ANALYSIS*

As previously noted, two petitions for review are currently pending before the Board challenging the Region's permit decision in this matter – one filed by Mr. Anderson and one filed by the Town of Florence and SWVP-GTIS MR, LLC. The Board will first address the petition for review filed by the Town of Florence and SWVP-GTIS MR, LLC because that petition raises issues that go to the scope of the Board's jurisdiction and what the Board may consider in this matter. The Board will then address Mr. Anderson's petition.

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[7] The SDWA requires public water systems to adopt MCLs for contaminants that may have an adverse impact on human health. MCLs are to be set as close as "feasible" to a maximum "level at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety." SDWA § 1412(b)(4)(A)-(B), 42 U.S.C. § 300g-1(b)(4)(A)-(B).

A. *Town of Florence and SWVP-GTIS MR, LLC Petition for Review (UIC Appeal No. 17-03)*

The petition filed by the Town of Florence and SWVP-GTIS MR, LLC (collectively, "Town of Florence" or "Town") is limited in the scope of review that it seeks. The petition is based on one overarching contention that the Region clearly erred, abused its discretion, or made inappropriate policy choices when the Region relied on the 1997 Aquifer Exemption in issuing the Permit. *See* Town of Florence & SWVP-GTIS MR, LLC, *Petition for Review of Underground Injection Control Permit Issued by USEPA Region 9 for the Florence Copper Project*, UIC Appeal No. 17-03,21 (Jan. 19, 2017) ("Town Petition"); Oral Arg. Tr. at 77, 105. In support of its argument, the Town maintains that land uses and local zoning regulations have "changed dramatically" since issuance of the 1997 Aquifer Exemption and, as a consequence, the contours of the Exemption are "based on circumstances that no longer exist." Town Petition at 13-14. The Town claims that the Exemption's large size is not commensurate with the small Production Test Facility authorized by the Permit. *Id*. at 28-34. The Town also argues that the bottom 200 feet of the Lower Basin Fill Unit, exempted from USDW status as part of the 1997 Aquifer Exemption, do not contain commercially producible copper, and therefore are not properly so exempted. *Id*. at 22-28.

Given those factors, the Town contends that the Region should have rescinded or revoked the 1997 Aquifer Exemption and prepared a new aquifer exemption specifically tailored to the small scope of the Production Test Facility. *Id*. at 34-38. That small scope, the Town argues, should have encompassed just the portion of the Production Test Facility area of review that extends downward from the bottom of the Lower Basin Fill Unit into the Oxide Bedrock Zone and excludes the entirety (including the deepest 200 feet) of the Lower Basin Fill Unit. *Id*. at 21, 28, 37. Based on that argument, the Town asks the Board to remand the Permit to the Region "with direction to require a new aquifer exemption application and revocation of the 1997 Aquifer Exemption." *Id.* at 38. Thus, the Town's argument is limited to the 1997 Aquifer Exemption. Indeed, the Town confirmed at oral argument that it challenges only the areal extent of the 1997 Aquifer Exemption and that the Exemption includes a portion of the Lower Basin Fill Unit. Oral Arg. Tr. at 81. The Town does not challenge any Permit term or condition (except to the extent the Town argues that the Region incorporated the 1997 Aquifer Exemption's details into Part II.B of the Permit), nor does the Town challenge the Region's conclusion that the portion of the exempted aquifer that would be affected by operation of Florence Copper's Production Test Facility continues to meet the

factual criteria to be designated an exempted aquifer. *Id.* For the reasons that follow, the Board denies the Town's Petition for review.

As noted in Part II above, the Board has jurisdiction over petitions for review appealing a UIC permit decision issued under the Agency's permitting regulations. *See* 40 C.F.R. § 124.19(a). The Board's authority to review UIC-related permitting disputes, however, is not unbounded. *In re Envtl. Disp. Sys., Inc.*, 12 E.A.D. 254, 266-67 (EAB 2005) (collecting cases). Generally, the Board's jurisdiction in these kinds of cases is limited to evaluating specific UIC permit provisions and permit issuer compliance with the SDWA and UIC permitting regulations. *See id.*

Aquifer exemption decisions, though made using criteria set forth in the UIC implementing regulations at 40 C.F.R. § 146.4, are not themselves UIC permitting decisions or elements thereof within the meaning of 40 C.F.R. § 124.19(a). Aquifer exemption decisions are, instead, discrete "final agency actions" that delineate the boundaries of USDWs, are subject to public notice, and must be challenged in the appropriate federal circuit court of appeals within forty-five days or later if based solely on grounds arising after that deadline. *See* SDWA § 1448(a)(2), 42 U.S.C. § 300j-7(a)(2) (petition for review of "any other final action of the Administrator * * * may be filed in the circuit in which the petitioner resides or transacts business [that] is directly affected by the action"); 40 C.F.R. § 144.7(b)(2)-(3); Memorandum from Peter Grevatt, Dir., Ofc. Ground Water & Drinking Water, EPA, to Water Div. Dirs., EPA Regions 1-10, at 1-2 (July 24, 2014) ("Grevatt Memo") (explaining aquifer exemption approval process and noting that where states or tribes administer the UIC program they must "provide for public participation" and where EPA directly implements UIC program, regional offices are responsible for "issuing public notices"); *see, e.g., W. Neb. Res. Council v. EPA*, 793 F.2d 194, 200-01 (8th Cir. 1986) (exercising jurisdiction under 42 U.S.C. § 300j-7(a) and resolving petition for review challenging EPA's limited approval of a proposed aquifer exemption submitted by Nebraska, which EPA treated as a proposed modification to Nebraska's approved UIC program).[8]

[8] In *Western Nebraska Resources Council*, the Eighth Circuit reviewed EPA's limited approval of an aquifer exemption submitted by Nebraska and by the time EPA acted on the state's proposed aquifer exemption Nebraska had an approved UIC program. 793 F.2d at 197. Thus, EPA reviewed Nebraska's aquifer exemption request as a proposed revision to Nebraska's UIC program. Here, EPA processed and granted the 1997 Aquifer Exemption because Arizona is not authorized to administer its own UIC program. The Board sees no reason why the Region's issuance of the 1997 Aquifer Exemption is not

Advocacy for the limited aquifer exemption that the Town contends should have been available here directly challenges the 1997 Aquifer Exemption and its boundaries. The Board, therefore, is not the proper forum to resolve the Town's part 146 aquifer exemption-related arguments because aquifer exemption decisions are discrete final agency actions that are not part of UIC permitting decisions, are separately operable from any UIC permit, and are subject to challenge in a different forum under the SDWA. *See, e.g.*, *In re Mesabi Nugget Del., LLC*, 15 E.A.D. 812, 814-16 (EAB 2013) (dismissing petitions for lack of jurisdiction to review state-issued Clean Water Act § 303(c) water quality standard variance approved by EPA Region 5); *In re City of Moscow*, 10 E.A.D. 135, 160-61 (EAB 2001) (declining to review EPA-approved Idaho Total Daily Maximum Load for phosphorus on ground that Board ordinarily does not decide validity of "prior, predicate regulatory decisions that are reviewable in other fora"); *In re Suckla Farms, Inc.*, 4 E.A.D. 686, 698-99 (EAB 1993) (declining to adjudicate validity of UIC regulations or underlying policy judgments, which are reviewable in other fora).

To the extent the Town of Florence argues that the Board nevertheless may review the substance of the 1997 Aquifer Exemption because the Region incorporated the Exemption's details into Part II.B of the Permit, that argument fails for at least two reasons. First, nothing in the Agency's regulations and policies suggest that aquifer exemptions expire, and the Town has not identified any legal requirements or policy documents (and the Board is not otherwise aware of any)

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subject to judicial review under the language SDWA § 1448(a)(2), 42 U.S.C. § 300j-7(a)(2), just as EPA's approval of an aquifer exemption as a revision to a state's UIC program is, particularly in light of the Region's representation in its brief and the judicial review anomalies that may result were the rule otherwise. *Region 9 Response to Petition for Review*, UIC Appeal No. 17-03, at 15 n.3 (Apr. 7, 2017) (stating that "plain language of SDWA is clear that the Region's approval of the 1997 aquifer exemption is final agency action reviewable in federal [c]ircuit [c]ourts," and quoting and citing SDWA § 1448(a)(2), 42 U.S.C. § 300j-7(a)(2)). The Board also notes that, to the extent subordinates to the Administrator make decisions with respect to proposed aquifer exemptions, that is done pursuant to authority delegated by the Administrator. *See* EPA Region 9, *Statement of Basis for a Draft Permit and Proposed Aquifer Exemption, BHP Florence Project* 3 (Feb. 1997) (A.R. #238); *see also* SDWA § 1450(a), 42 U.S.C. § 300j-9(a) (authorizing Administrator to prescribe such regulations as necessary or appropriate to carry out his functions under SDWA and providing that Administrator may delegate any of his functions under SDWA (other than prescribing regulations) to any officer or employee of the Agency).

that direct Agency permit issuers to revisit existing aquifer exemptions at particular intervals or before issuing a UIC permit. In fact, the 1997 Aquifer Exemption explicitly states it "has no expiration date." 1997 Aquifer Exemption at 3. Accordingly, once an area is designated an exempted aquifer, that area loses its status as a USDW under the SDWA and is subject to various potential uses. *See* Grevatt Memo at 3 ("without aquifer exemptions, certain types of energy production, solution mining, or waste disposal would be severely limited"). Moreover, regardless of whether or not a previously approved aquifer exemption is incorporated into a UIC permit, that aquifer exemption continues to exist as a free-standing determination and the area covered by the aquifer exemption continues not to be a USDW. As such, an aquifer exemption serves as a background legal condition that must be considered by an Agency permit writer when processing UIC permit applications and the public generally when making decisions that may affect or involve USDWs.

Second, an aquifer exemption is, as noted above, a designation of all or part of an aquifer as a non-USDW, using metes and bounds, latitude and longitude, and/or other spatial measurement tools to describe the three dimensions of the exempted area. *See* 40 C.F.R. § 144.7(b)(1). Permit issuers can appropriately incorporate exemption measurements as UIC permit conditions without necessarily opening the door to challenges to the underlying exemption decisions themselves.[9] As is the case with permit conditions that incorporate predicate, preexisting legal requirements that are subject to review through other channels (such as Clean Water Act water quality standards or SDWA maximum contaminant levels), the Board ordinarily will not adjudicate the validity or legality of such requirements in permit appeals. *See*, *e.g.*, *Mesabi Nugget*, 15 E.A.D. at 814-16; *City of Moscow*, 10 E.A.D. at 160-61; *Suckla Farms*, 4 E.A.D. at 698-99. Under those principles, the Board lacks jurisdiction over the arguments raised in the Town's petition. Thus, while the Region did not clearly err by incorporating the 1997 Aquifer Exemption into the Permit, the incorporation of the Exemption into the Permit does not give the Board the authority to review the substance of the 1997 Aquifer Exemption as the Town seeks.

[9] Rather than "incorporating" the 1997 Aquifer Exemption "into" the Permit, Part II.B of the Permit may also be viewed as simply incorporating the metes and bounds of the 1997 Aquifer Exemption merely to delineate where USDWs protected by the SDWA begin and prohibiting any migration of injection fluids into those USDWs.

Given the Board's conclusion that it lacks jurisdiction over the Town's part 146 aquifer exemption-related arguments, the question arises whether the Town of Florence has any other avenue currently available to raise those arguments and potentially obtain the relief it seeks. The Board inquired into that question at oral argument. *See* Oral Arg. Tr. at 92-93, 113-15, 124, 136. The Region (though not speaking on behalf of the Department of Justice and what the Department might argue in federal court litigation) posited that the Town could petition the Agency to review the 1997 Aquifer Exemption and if the Agency denied the petition the Town could seek to have the Court of Appeals for the Ninth Circuit review the adequacy of the Agency's decision. *Id*. at 112-14. In contrast, Florence Copper took the position that once an aquifer exemption is issued it cannot be revoked or reduced and, as such, any petition to the Agency must be denied. *Id*. at 136-39. As those issues are beyond the scope of the pending petitions for review and resolving them is not necessary to dispose of the pending petitions, the Board does not address them here. The Town, however, remains free to pursue those issues for resolution by the proper entity in other fora.[10]

B. *Mr. Anderson's Petition for Review*

1. *Summary of Mr. Anderson's Contentions*

In his petition for review, Mr. Anderson expresses general concerns that the Region and Arizona[11] approved the Permit for an in-situ mining facility "in or near an aquifer used for drinking water and farming" that he contends will "pollut[e] the same aquifer that supplies drinking water to [his] community." Letter from John L. Anderson to Clerk, Envtl. Appeals Bd. 1 (Jan. 12, 2017) ("Anderson Petition"). Mr. Anderson also asserts that he was told by an EPA engineer that modeling

[10] Florence Copper filed a motion for leave to file a surreply (with an attached surreply) to respond to what Florence Copper maintains is "a misleading description, in the [Town's Reply Brief], of the nature of the permit proceeding in this matter relative to the applicable rules." *Permittee Florence Copper, Inc.'s Motion for Leave to File Surreply*, UIC Appeal No. 17-03, at 1 (May 1, 2017) . Having disposed of the Town's Petition without needing to consider Florence Copper's tendered surreply, the Board denies Florence Copper's motion for leave to file a surreply as moot.

[11] Although EPA is the permitting authority in Arizona for UIC permits, any state or local approvals necessary for construction or operation of a UIC facility are outside the scope of the Board's jurisdiction in UIC permit appeals. *See In re Sammy-Mar*, 17 E.A.D. 88, 97-98 (EAB 2016). The Board's review is therefore limited to the federally issued permit.

showed migration from the proposed mine would not reach a well servicing his community for twenty years, and from there contends that the Agency has "openly admitted that [its] model showed migration" from the Production Test Facility. *Id.* at 2. Citing data compiled by the U.S. Geological Survey from studies of in-situ uranium mining in Texas,[12] Mr. Anderson maintains that contaminants will be released into surrounding groundwater and "there has never been an in-situ mine where the aquifer was recovered to drinking water standards during or after the mine was abandoned." *Id.* Mr. Anderson also cites to an article published by the Arizona Geological Survey summarizing the use of solution mining for copper extraction. *Id.* at 1-2; *see id*. attach. 3 (David F. Briggs, Ariz. Geol. Survey, Cont. Rep. CR-15-A, *Recovery of Copper by Solution Mining Methods* (Aug. 2015)) ("Briggs Article"). The Briggs Article includes a table listing the "pros and cons" of solution mining.[13] Mr. Anderson maintains that "[a]ny one of" those "cons" justifies not approving the Permit. *Id.* at 1. The "cons" Mr. Anderson relies on are:

- Loss of leach solutions can result in groundwater contamination, reduced metal recovery, and loss of reagents.

- Planning and development of solution mining projects require considerable field testing, which sometimes proves to be difficult and costly.

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[12] While Mr. Anderson's petition states that the U.S. Geological Survey has data on uranium and coal mines, Anderson Petition at 1, the U.S. Geological Survey document attached to his petition seemingly only addresses uranium mining in Texas.

[13] The Briggs Article explains that there are two types of solution mining, in-situ mining and in-place mining:

> In-place solution mining employs permeability enhancement techniques such as blasting or previous mining activities (i.e., block-caving) to fragment or increase the permeability of the rock prior to applying a leaching solution to liberate a desired commodity from the ore. In-situ methods [the method used in the current permit] rely solely on the naturally occurring permeability of the ores.

Briggs Article at 1. While it is not clear whether the list of pros and cons in the article apply equally to both types of solution mining, that lack of clarity ultimately is not material to the Board's analysis.

- Both physical and chemical constraints limit its application to a few sites, where conditions are favorable.

- Total copper recoveries are generally less than conventional methods.

- Time required for metal extraction is generally greater than conventional mining and processing.

- Like conventional heap leach operations, in-situ methods only recover copper. They are unable to recover byproduct metals (i.e., molybdenum, gold, or silver).

- By its very nature, solution mining technology relies on hydrological models and predictions. It is generally very difficult to observe what is really happening below the earth's surface.

- Solution flow patterns are very difficult to accurately quantify, engineer and control.

- Solution mining works best under saturated conditions, but leachable deposits are not always located below the water table.

- Environmental management works best when the ore body can be isolated from adjacent aquifers.

Anderson Petition at 1-2; Briggs Article tbl.2, at 6. Mr. Anderson's Petition does not sufficiently tie any of those general concerns to the Region's permit decision here or any of the Permit's terms or conditions.

To summarize, Mr. Anderson's Petition essentially raises three general concerns: (1) sources of drinking water will not be adequately protected from migrating mining-related fluids; (2) aquifers cannot be successfully restored after in-situ mining activities; and (3) the "cons" identified in the Briggs Article justify denying the Permit. While the Board appreciates and does not discount Mr. Anderson's concerns about potential impacts to drinking water sources, Mr. Anderson's Petition does not satisfy threshold procedural requirements necessary to support Board review. And even if the Board were to consider the Petition on the merits, the Board would conclude that Mr. Anderson has not met his burden under applicable regulations and Board precedent to demonstrate that review of the Permit is warranted.

2. *Procedural Requirements Not Met*

As a procedural matter, a petition for review must, among other things, demonstrate, with factual and legal support, why a permit condition or other challenge warrants Board review, including an explanation as to why the Region's response to comments on the issue raised, if any, was clearly erroneous or otherwise warrants review. *See* 40 C.F.R. § 124.19(a)(4). Again, the Board recognizes and does not discount Mr. Anderson's concerns, but his petition fails to comply with that procedural requirement. While Mr. Anderson's Petition provides the Board with general concerns about: (1) migration of fluids from the Florence Copper Production Test Facility; (2) the effectiveness of aquifer restoration efforts after in-situ mining; and (3) the possible effects of solution mining generally, his Petition fails to indicate whether or how these concerns apply to, or are not addressed by, the Permit, the Region's response to comments, and the Administrative Record.[14] As such, his petition fails to provide a sufficient basis on which to consider whether review is warranted. *See In re Windfall Oil & Gas, Inc.*, 16 E.A.D. 769, 797-98 (EAB 2015) (denying review where petitioners failed to substantively confront Region's responses to comments or adequately explain why Region's responses were clearly erroneous or otherwise warranted review); *In re Genesee Power Station*, 4 E.A.D. 832, 867 (EAB 1993) (holding that petition providing only list of general objections to permit lacks specificity necessary to support Board review under 40 C.F.R. § 124.19).[15]

That pleading deficiency provides a sufficient basis standing alone to deny Mr. Anderson's Petition. But, as explained below, even considering

[14] Mr. Anderson also asserts that the Region failed to respond to his specific concerns and comments made at the public hearing. Mr. Anderson does not, however, identify any particular concern or comment that he allegedly raised at the hearing to which the Region did not respond. *See* Anderson Petition at 1; Oral Arg. Tr. at 24-25. His generic assertion is insufficient to provide a basis on which to consider whether review is warranted. *See In re Pio Pico Energy Ctr.*, 16 E.A.D. 56, 76-77 (EAB 2013) (holding that conclusory assertions regarding alleged inadequacy of Region's response to comments are insufficient to justify Board review).

[15] The Board also notes that the Briggs Article that Mr. Anderson appended to his petition, and on which his petition relies, is dated after the public comment period on the Draft Permit closed and is not in the Administrative Record. The Board generally will not supplement an administrative record with, or consider, materials that were not before the

Mr. Anderson's arguments on the merits, upon a thorough examination of the record, the Board would conclude that Mr. Anderson's Petition fails to demonstrate any clearly erroneous finding of fact or conclusion of law, abuse of discretion, or other issue warranting review.

3. *The Petition Fails to Establish Any Clearly Erroneous Finding of Fact or Conclusion of Law, Abuse of Discretion, or Other Issue Warranting Review*

a. *Protection from Fluid Migration*

With respect to potential migration of injected fluids, the Board notes that the Region reasonably responded to concerns regarding that issue. Not only does the Permit protect USDWs, but the Permit's terms and conditions are all designed so that fluids will not migrate outside the Production Test Facility's well field, let alone the area of review. To start, it bears noting that the aquifer portion in the Production Test Facility's area of review is not a USDW for purposes of the SDWA because of the 1997 Aquifer Exemption, and the Region confirmed that no drinking water or other producing water wells exist within the area of review. *See supra* Part IV.A (disposing of Town of Florence's challenge to 1997 Aquifer Exemption); Statement of Basis at 13; Response to Comments ¶ 15, at 15. Moreover, the permitting process reflects that the Region was aware of, and responded to, concerns regarding the migration from the Production Test Facility's well field and potential impacts on any adjacent USDW. The Region undertook a careful review of the record, including fully evaluating the impacts on any USDWs, accepting and reviewing comments during an extended public comment period, revising the Draft Permit in response to comments, and ensuring that the Final Permit's conditions complied with the SDWA and applicable regulations.

The Permit includes conditions requiring maintenance of hydraulic control of injected fluids (*see* Permit conds. II.E.1, .F.5, .H, at 16-17, 28, 34-37); a limit on injection pressure to prevent fractures (Permit cond. II.E.4, at 20-21); testing, monitoring, and reporting requirements designed to ensure well integrity (Permit cond. II.E.3, at 17-20); and detailed construction and operating requirements (Permit conds. II.C, .E, at 9-15, 16-23). All of those provisions are designed to ensure that injected fluids do not migrate outside the area of review or into the Lower Basin Fill Unit. *See* Response to Comments ¶ 18, at 18. Notably, the Permit

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permit issuer at the time of the permitting decision. *See In re Dominion Energy Brayton Point, LLC*, 12 E.A.D. 490, 516-19 (EAB 2006).

includes detailed contingency plans with respect to maintaining hydraulic control. In particular, the Permit requires that within twenty-four hours of becoming aware that the volume of fluids recovered from the injection and recovery zone is less than 110 percent of the amount of fluid injected during the same twenty-four-hour period, Florence Copper must:

- adjust the flow rate for recovery and/or injection to restore the percent of recovered fluid volume to at least 110 percent of injected volume;
- inspect the facility;
- initiate pressure testing if fluid loss is not caused by surface facility failure; and
- conduct necessary repairs.

Permit conds. II.H.1.a, .c, at 34-35. The Permit then includes detailed actions that Florence Copper must take in the event that an actual loss of hydraulic control occurs, as defined by the Permit. Permit conds. II.H.1.b, .c, at 35. (Under the Permit, a loss of hydraulic control is deemed to occur when – during a forty-eight-hour period – the amount of fluid recovered is less than 110 percent of the amount of fluid injected during the same time period, an inward gradient of less than one foot or an outward gradient is observed in any pair of observation/recovery wells, or an action level in electrical conductivity values[16] above statistical noise levels in observation wells is reached.[17] Permit cond. II.H.1.b, at 35; *see id*. cond. II.F.6.b.ii, at 29.)

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[16] As explained in Part III.B.3 above, if acid and sulfate levels increase at an observation well, electrical conductivity readings will increase, thus indicating the presence of injected fluids (and a loss of hydraulic control) and triggering contingency actions to prevent migration of fluids. Statement of Basis at 7, 9; Response to Comments at 3 & ¶¶ 7-10, 24, at 11-13, 22.

[17] The Region also included in the Final Permit specific procedures that Florence Copper must conduct, prior to injection, to establish background electrical conductivity levels at the observation wells and to identify a statistically significant increase in electrical conductivity values at the observation wells that would signal a loss of hydraulic control and possible fluid migration requiring contingency actions. *See* Permit cond. II.F.6.b, at 29; Response to Comments at 3 & ¶ 24, at 22 ("EPA modified permit language for requirements of [electrical conductivity] monitoring and reporting to clarify that the [electrical conductivity] standards will be based on a statistically significant increase above

In response to comments on the Draft Permit expressing concern about the possible vertical migration of injected fluid into the Lower Basin Fill Unit, the Region included additional conductivity monitoring in the Final Permit. *See* Response to Comments ¶ 6, at 10-11. In particular, the Region added to the Final Permit a requirement that Florence Copper install electrical conductivity sensors on observation wells through the Lower Basin Fill Unit/oxide interface, which wells will be located at the perimeter of the well field. *Id.* ¶ 6, at 11; *see* Permit conds. II.C.6.d, .F.6, at 14, 28-31; *see also* Permit app. B figs.M-6, M-7 (proposed well construction diagrams). The Region explained that monitoring of electrical conductivity at those sensors will provide additional protection by allowing detection of any fluid migration into the Lower Basin Fill Unit and trigger contingency actions to restore hydraulic control or reverse vertical migration as needed. Response to Comments at 1 & ¶ 6, at 11; Permit conds. II.F.6.b.ii, .H.1.b, at 29, 35.

The Permit also includes a robust water quality monitoring program to detect and address any fluid movement outside the Production Test Facility's well field before the fluid can migrate outside the area of review, let alone reach any surrounding USDW. *See* Permit cond. II.F, at 23-31. As discussed previously, under the Permit, eight water quality monitoring wells will be located outside the Production Test Facility's well field, but within the area of review, that will measure water quality in the Oxide Bedrock Zone, the Lower Basin Fill Unit, and the Upper Basin Fill Unit. *See* Permit cond. II.F.1, at 23; Permit Appl. attach. P fig.P-1 & tbl.P-2. The Permit includes actions that must be taken by Florence Copper in the event that monitoring wells show an exceedance of water quality parameters established under the Permit, termed Alert Levels or Aquifer Quality Limits.[18] Permit cond. II.H.2, at 35-37. Thus, the Permit's provisions with respect

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measured ambient and noise levels at each observation well rather than [electrical conductivity] differentials between observation and recovery wells.").

[18] Permit Condition II.F requires that Florence Copper establish "Alert Levels" for certain "Level 1 Parameters" that include constituents in the injected fluids most likely to provide an early indication of groundwater impacts associated with operation of the Production Test Facility, subject to EPA review and approval. Permit cond. II.F.2.a., c. Level 1 Parameters are listed in Table I on page 24 of the Permit. Similarly, the Permit requires that Florence Copper establish "Aquifer Quality Limits" for certain "Level 2 Parameters" that include constituents for which maximum contaminant levels have been established and "other relatively probable constituents" that are likely to appear in greater concentrations in groundwater affected by injected fluids from the Production Test Facility,

to monitoring wells provide additional protection to ensure that fluids remain where envisioned by the Permit – within the area of review, if not within the well field itself.

Notwithstanding the Permit's protective measures, Mr. Anderson maintains that he was told by an EPA engineer that modeling showed migration from the proposed mine would not reach a well servicing his community for twenty years and therefore EPA "openly admitted that [its] model showed migration." Anderson Petition at 2. Mr. Anderson does not provide a citation to the record regarding the specific comment, and the Board has not been able to otherwise locate it. The Board is therefore unable to determine the content or context of the comment. Nonetheless, the Board notes, and as the above discussion makes clear, the Permit's terms and conditions are all designed to maintain hydraulic control and ensure that fluids are contained within the area of review (if not the smaller Production Test Facility's well field) and that they do not migrate vertically to the Lower Basin Fill Unit.

The Region also explained that it did not believe that vertical migration of in-situ copper recovery fluids into the lowermost portion of the Lower Basin Fill Unit during Production Test Facility operations was likely to occur. Response to Comments ¶ 12, at 13. For the former BHP site (which operated under a less stringent permit than the present Permit),[19] movement of in-situ copper recovery fluids into the Lower Basin Fill Unit was predicted to be twenty to forty feet. *Id.* With respect to the Production Test Facility, under a worst-case scenario of a loss of hydraulic control for up to thirty days, modeling indicated no more than fifty-

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subject to EPA review and approval. *Id.* conds. II.F.2.b., .d.; *see supra* note 7. Level 2 Parameters are listed in Table 2 on page 25 of the Permit.

[19] *See* Response to Comments ¶ 1, at 7 ("[T]he UIC [P]ermit for the [Production Test Facility] is significantly different from the BHP permit in that it requires five supplemental monitoring wells to be placed at the perimeter of the [Production Test Facility] well field to detect potential lateral excursions of [] fluids. The [P]ermit also requires two monitoring wells placed above the orebody (one in the Lower Basin Fill Unit * * * and one in the Upper Basin Fill Unit * * *), slightly downgradient of the well field, to detect potential vertical excursions [i.e., migration] from the oxide bedrock unit orebody. In contrast, no monitoring wells were installed near the BHP well field for the earlier BHP Pilot Test.").

four feet of vertical migration into the Lower Basin Fill Unit, which is part of the exempted aquifer in any event. *Id.*[20]

In addition, as the Region pointed out during the permitting process, after Florence Copper completes its injection activities and before closure of the well field is authorized, the Permit requires rinsing and aquifer restoration to ensure that it complies with MCLs under the SDWA or with preoperational background levels for all constituents (whichever is more stringent). *See* Permit cond. II.I, at 27-39; *see also* Response to Comments ¶¶ 5, 19-20, at 10, 19. The Permit also requires five years of post-closure monitoring, which may be extended beyond five years if EPA deems it necessary to ensure adequate protection of USDWs. *See* Permit cond. II.I, at 7; *see also* Response to Comments ¶ 20, at 19. In short, the Permit's terms and conditions are consistent with the requirements of the SDWA and the applicable regulations, and are designed to detect and address fluid movement outside the Production Test Facility's well field before any fluid can migrate outside the area of review, let alone reach any surrounding USDW.

b. *Aquifer Recovery After In-situ Mining*

Next, Mr. Anderson asserts, based on information regarding aquifer recovery at uranium in-situ mines, that no aquifer has successfully been recovered during or after in-situ mining. Anderson Petition at 1. The Region responded to

[20] The Region also confirmed that no drinking water or other producing water wells exist within the area of review, and all of the Town of Florence's existing public water supply wells to the east and southeast of the Florence Copper property boundary are *upgradient* of Florence Copper's property. Statement of Basis at 13; *see also* Response to Comments ¶ 15, at 15. The nearest *downgradient* public water supply wells exist about two to three miles west to northwest of the Production Test Facility at the Anthem at Merrill Ranch residential development, and those wells draw from the Lower Basin Fill Unit. Statement of Basis at 14. The Region confirmed, based on "groundwater flow model simulations presented in the application and other calculations," that groundwater migration from the Lower Basin Fill Unit above the Production Test Facility mine zone "has a travel time to the location of the closest Merrill Ranch well in excess of 200 years, which would exceed the reasonable lifetime of any public drinking water wells." Statement of Basis at 14; *see* Response to Comments ¶ 15, at 15-16. Put another way, absent operation of the Production Test Facility and any of the Permit's protective terms and conditions, it would take over 200 years for a molecule to travel in groundwater from the Production Test Facility to the closest Merrill Ranch well. Mr. Anderson has pointed to nothing concrete in the record to dispute that 200-year figure, and the Board is not otherwise aware of any contrary information.

those concerns during the permitting process, acknowledging that restoration results at uranium mines have had documented challenges. Response to Comments ¶ 46, at 33. Nonetheless, the Region noted that aquifer restoration success was demonstrated for in-situ recovery copper mining at the BHP Pilot Test site (which involved in-situ copper mining and was located in the same general area as Florence Copper's Production Test Facility) within six years of cessation of operations. *Id.* The Agency approved closure of the BHP well field in 2005 after rinsing operations were concluded in 2004. *Id.* The Region further noted that no exceedances related to in-situ copper recovery operations have been reported in quarterly monitoring of point-of-compliance wells since the initiation of the BHP Pilot Test in 1997. *Id.* The Region explained that the BHP project is much more relevant and applicable to Florence Copper's Production Test Facility than the restoration at the in-situ uranium mining operations cited by commenters. *Id.* The Region also observed that restoration results at uranium in-situ mines are not directly comparable to expected restoration results for in-situ copper recovery mining operations because of differences in, for example, geological settings, geochemical reactions, and mobilizing solutions used to recover copper versus uranium. *Id.* ¶ 55, at 38. The Region noted that uranium in-situ recovery mines in the United States are typically located in sedimentary deposits, while copper deposits usually occur (as is the case at the Production Test Facility) in igneous rock. *Id.* Mr. Anderson provides no explanation as to why the Region's discussion and conclusions on these matters are clearly erroneous or are otherwise deficient.

c. *The Briggs Article's "Cons" of Solution Mining*

The Board now turns to the list of "cons" in the Briggs Article on which Mr. Anderson relies. As noted above, Mr. Anderson fails to indicate how the Briggs Article's "cons" apply to, or are not addressed by, the Permit, and therefore his arguments fail to confront the Region's rationale for issuing the Permit and lack the degree of specificity necessary to support a petition for review. In addition, many of the "cons" in the Briggs Article address the differences between, and the relative effectiveness of, solution mining as compared to conventional mining (e.g., physical and chemical constraints limit application of in-situ copper recovery to a few sites that have favorable conditions; copper recoveries are generally less than using conventional methods; the time required for extraction is generally greater than conventional mining and processing; and in-situ methods recover only copper and do not recover other byproduct metals). While each type of mining may have

"pros" and "cons",[21] those issues are beyond the scope of the UIC permitting process and the Board's review here. The UIC permitting process is narrow in its focus, limited to the protection of USDWs, and the Board's review of UIC permit decisions extends only to the boundaries of the UIC permitting program. *See In re Bear Lake Props., LLC*, 15 E.A.D. 630, 643-44 (EAB 2012); *In re Envtl. Disp. Sys., Inc.*, 12 E.A.D. 254, 266 (EAB 2005); *In re Am. Soda, LLP*, 9 E.A.D. 280, 286 (EAB 2000) ("'the SDWA * * * and the UIC regulations * * * establish the *only* criteria that EPA may use in deciding whether to grant or deny an application for a UIC permit'") (quoting *In re Envotech, LP*, 6 E.A.D. 260, 264 (EAB 1996)). Where, as here, a petitioner raises concerns outside the scope of the UIC program, the Board denies review. *See, e.g.*, *In re Archer Daniels Midland Co.*, 17 E.A.D. 380, 402 (EAB 2017) (denying review of property issues as beyond the scope of UIC permitting process). And to the extent the Briggs Article's "cons" include general concerns about the safety of solution mining of copper, as detailed above, the Permit complies with the UIC program.

In sum, as discussed above, Mr. Anderson's Petition is procedurally deficient in that it fails to indicate how Mr. Anderson's general concerns about in-situ mining apply to, or are not addressed by, the Permit, the Region's response to comments, and the Administrative Record. Further, even considering Mr. Anderson's arguments on the merits, the Board would conclude that the Region, in response to concerns expressed during the public comment period, provided a thorough and reasoned response and explained why the Permit complies with the SDWA and applicable regulations. Mr. Anderson's Petition fails to

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[21] Among the "pros" listed in the Briggs Article for the use of solution mining for copper extraction are the following:

> - Smaller, ephemeral, environmental footprint with less surface disturbance (waste dumps, tailings ponds, etc.) and less water and air pollution than conventional mining projects;
>
> - Total energy consumption is less than conventional mining methods; and
>
> - Total water consumption is less than conventional methods as a result of reduced evaporation and elimination of water contained within conventional tailings impoundments.

Briggs Article tbl.2, at 6.

demonstrate that the Region clearly erred or that review is otherwise warranted. Accordingly, the Board denies Mr. Anderson's Petition.

## V. *CONCLUSION*

For the foregoing reasons, the Board denies the petitions for review filed by Mr. John L. Anderson (UIC Appeal No. 17-01) and jointly by the Town of Florence and SWVP-GTIS MR, LLC (UIC Appeal No. 17-03).

So ordered.