

# WESTERN MINING ACTION PROJECT

---

*Roger Flynn, Esq.,  
Jeffrey C. Parsons, Esq.*  
P.O. Box 349  
440 Main Street, Suite 2  
Lyons, CO 80540  
(303) 823-5738  
Fax (303) 823-5732  
[wmap@igc.org](mailto:wmap@igc.org)

via email

June 10, 2011

Valois Shea  
U.S. Environmental Protection Agency Region 8  
8P-W-GW, UIC  
1595 Wynkoop Street  
Denver, CO 80202  
[shea.valois@epa.gov](mailto:shea.valois@epa.gov)

RE: Proposed Underground Injection Control Program (UIC) Permit (Permit Number: CO52209-08412); Powertech (USA) Incorporated.

Dear Ms. Shea,

Thank you for the opportunity to comment on your agency's third draft proposed Underground Injection Control Program (UIC) Permit (Permit Number: CO52209-08412) for Powertech (USA) Incorporated's proposed aquifer pump test in the Fox Hills Aquifer in Weld County, Colorado. These comments are submitted on behalf of Coloradoans Against Resource Destruction (CARD). CARD is a non-profit member-supported, public interest organization promoting conservation of the natural environment by influencing public policy decisions through legislative, administrative, and legal avenues. Primarily, CARD is focused on ensuring protection of ground water, public health, quality of life, and economic prosperity from threats posed by proposed in-situ leach uranium mining in Weld County, Colorado.

As discussed herein, the draft permit cannot be issued as proposed, and in any case, should be amended to include additional and amended terms to protect local aquifers from contamination during Powertech's activities. These comments expressly incorporate and re-assert the comments submitted by all parties on the previous version of this permit, Permit Number 51237-08412, previously withdrawn by EPA Region 8, including comments submitted to EPA by CARD on July 24, 2009 and December 24, 2009. These comments also incorporate by reference in whole the Appeal filed with the EPA Environmental Appeals Board by CARD on January 3, 2011.

At a minimum, substantial additional information is required to demonstrate the ability of the permit applicant to protect underground sources of drinking water. This information includes additional baseline data, including additional data on the water quality of both the injectate and the receiving water, as well as data on the hydro-geologic conditions at the site. In addition, the permit applicant should be required to demonstrate that the substantial historic exploration drilling in the area of the proposed

permit will not result in contamination of adjacent aquifers, including underground sources of drinking water. Lastly, the EPA's permit processing exercise should be better coordinated with the required state permitting process for the proposed underground injection activities.

Regarding the Draft UIC Permit and the Statement of Basis for the permit, we make the following specific comments, looking forward to the EPA's detailed response to each:

1. The Statement of Basis recognizes that the water to be pumped from the aquifer contains elevated uranium and radium concentrations above the established MCL. However, the water quality table and data presented in the permit lacks any constituent limits for any radioactive constituents, such as uranium, radium 226/228, or gross alpha/gross beta, among others. Included in these are constituents that have limits under applicable Colorado groundwater standards. There is no reason stated for the lack of this data or respective permit limits in the permit materials. Although the permit refers to the 40 CFR Part 141 MCL's, it does not clarify if the permit includes the radionuclides. Other data submitted to the State of Colorado demonstrates constituent levels in the A2 sands aquifer at levels higher than applicable regulatory limits. (attached Laboratory Analytical Report submitted by Powertech on March 3, 2009 to the Division of Reclamation Mining and Safety representing the quality of the water in the A2 sands). These regulatory limits differ from those set forth in the permit materials, and include many constituents not contained in the EPA's permit materials. The permit should be amended to specifically include each of these constituents and limits, and particularly the radionuclides, in the monitoring, reporting, and limitations specified for the permit. This is particularly important given the potential of Powertech's drilling activities to mobilize these radioactive constituents, as discussed herein.

2. EPA imposes a requirement for treatment if the reinjection solution if it is contaminated above the permit limits, but there is no discussion of how or what this treatment might be or what impacts may result from such treatment. The Colorado Division of Reclamation, Mining and Safety (DRMS) has expressly asked for this information, but EPA has not, nor waited until this information is available through the state process. This lack of even basic information regarding the reasonably anticipated need for treatment raises substantial questions about the applicability of the "functional equivalence" doctrine upon which EPA relies under NEPA. To the extent EPA ignores substantial impacts associated with the activities permitted or contemplated, it falls short of the requirements of NEPA. The issues not addressed include such important issues as impacts from the treatment activities, including transport and disposal of treatment sludge. These are issues that have been raised by DRMS, which recognizes that because Powertech has an alternate plan of treating the pumped water, the company must provide information related to the impacts of such an alternate plan. EPA has required none of this information, and has not even waited for Powertech to provide the required responses to DRMS so that EPA may review and incorporate any of this information into its analysis. At minimum, EPA should refrain from issuing any permits until it has reviewed all of the information related to environmental impacts associated with the project, and allowed the public the opportunity to provide meaningful comment. EPA should amend the permit to require production of all information that is required by the state, and allow for public review and comment.

3. The Statement of Basis states that the permit will require sampling and analysis of both the A2 sandstone groundwater prior to the pump test and of the pumped water prior to reinjection as a measure necessary to verify that no contamination has occurred during storage. However, the permit itself contains no temporal restrictions on the taking of such samples to ensure that samples are taken at appropriate times to accomplish the intent of the sampling and analysis. As a result, the permit should be amended to require that the samples be taken at relevant times, including just prior to reinjection. The

draft permit should be revised to specifically require a full suite of water quality sampling prior to any injection into the aquifer, including sampling for radionuclides. Such a sampling is necessary to ensure that the injectate does not present a threat to underground sources of drinking water or to the existing quality in the aquifer, as required by 40 CFR § 144.82(a). This sampling should include protection against such things as bacterial growth in the storage containers, as well as to assess the potential impacts to the aquifer and the existing uses of the affected ground water.

4. The need for sampling prior to injection raises additional issues related to the draft permit – namely the lack of a requisite analysis of the existing water quality in the aquifer. In fact, there appears to be a critical lack of information related to the existing water quality in the affected aquifer, including the water quality of the proposed injectate. It appears that, as currently proposed, the agency is proposing to rely on a single sample from a single existing well to characterize the entire area of the aquifer from which the proposed injectate will be drawn and the area of the aquifer potentially impacted by the proposed reinjection activities. EPA should amend the permit to require a more robust and defensible characterization of the aquifer prior to any approval. Indeed, Powertech’s documents submitted to the state indicate that there are additional wells already drilled into the various formations in the aquifer, each of which should be subject to sampling in order to determine the applicable baseline permit limits (Map of proposed pump test area with wells attached). At minimum, EPA must provide the scientific rationale, including supporting studies or other justification, for its decision to accept a single sample from a single well, without a specified sampling methodology, as the sole demonstration of background ground water quality. CARD respectfully submits that such a narrow and undefined methodology is scientifically indefensible.

5. Further, there is a paucity of data demonstrating that the water to be drawn and reinjected will not encounter oxidizing conditions as the pumping and reinjection occurs (for instance, flow from reduction zones into more oxidizing zones that could lead to iron hydroxide precipitation and well fouling). Should this occur, it could result in mobilization of additional contaminants in the aquifer, posing additional threats to underground sources of drinking water.

6. Additionally, recent studies demonstrate that drilling and sampling activities such as those conducted by Powertech are susceptible to causing mobilization of radioactive and toxic constituents. *See* Abitz, Darling, “Anthropogenic Induced Redox Disequilibrium In Uranium Ore Zones,” Geological Society of America *Abstracts with Programs*, Vol. 42, No. 5, p. 57 (2010) (with presentation powerpoint slides)(attached); Sass, “Uranium Mining in Texas: Why is it Done That Way?” James A Baker III Institute for Public Policy, Rice University (March 28, 2011)(attached). These studies demonstrate that the process of drilling in an area associated with uranium ore bodies results in releases of radioactive constituents in concentrations that would not be there but for the drilling. Thus, the reinjected water is not “natural” water, but rather is water with increased anthropogenic contaminants. In order to counter this phenomenon, EPA must require a more extensive background water quality analysis, including the use of probes as discussed in the Abitz/Darling paper to ensure proper sampling. This analysis of background concentrations also requires a defensible sampling methodology that includes such techniques as those set forth in detail in the attached CARD comment submitted to DRMS, which includes a detailed review of proper baseline characterization methods, such as using valid statistical methods, sampling all horizons of the aquifer, turbidity measurements, quality control checks, among others, including EPA sanctioned protocols. (CARD November 18, 2009 comment with attached expert report from Dr. Richard Abitz). CARD anticipates that the expert report of Dr. Abitz will shed considerable light on the proper methodology for conducting a satisfactory baseline characterization, and hereby incorporates those comments here, looking forward to EPA’s detailed review and response to Dr. Abitz’ attached report.

As a result, the existing data set and analysis is inadequate. Should the data demonstrate that the quality of water proposed to be injected contains toxic or radioactive waste caused by industrial activities, a Class I UIC permit may be appropriate to ensure protection of underground sources of drinking water. However, without this data, and without a defensible methodology for establishing baseline, the EPA cannot make a reasoned analysis of the impacts of the proposed injection in order to fulfill its duty to protect underground sources of drinking water.

7. The additional information required of Powertech includes not only data on water quality of the aquifer and of the injectate, but also the geologic characteristics of the injection zone and the so-called confining strata. The EPA is authorized to require this information pursuant to 40 CFR § 144.27. Indeed, although drafted prior the finalization of the complete Class V regulatory program, the EPA's Statement of Basis and Purpose for the agency's Underground Injection Control Regulations issued by the EPA's Office of Drinking Water (May, 1980; National UIC Program Docket Control Number D 01079) demonstrates the potential problems where injectate containing contaminants will be injected above or below an underground source of drinking water and the geologic information is lacking. This document states, at pages 13-14:

[I]f the confining stratum which separates the injection zone from an overlying or underlying underground source of drinking water is either fractured or permeable, the fluids can migrate out of the receiving formation and into the protected region.

For obvious reasons, there are no well construction standards which can address this problem of migration of fluids through this pathway. Consequently, the regulations propose two provisions to assure that fluids do not travel this pathway into underground drinking water. First, the regulations require that, prior to the issuance of a permit, the geologic characteristics of the injection zone and confining strata be reviewed. Data already available from the states can assist Directors in making these reviews. A permit should only be issued upon the Director's finding that the underground formations are sufficiently sound to contain fluids in the injection zone. Second, the regulations require that well injection pressure be controlled to prevent opening fractures in the confining strata or otherwise causing the rise of fluids into an overlying protected zone.

In this case, the EPA should amend the permit to require the applicant to produce additional information regarding the geologic setting of the proposed injection activities.

Overall, significant additional data is necessary for the EPA to fulfill its obligations under the federal Administrative Procedure Act (APA), which requires that the agency consider all information and make its decision based on a rational assessment of all relevant facts and circumstances. Absent full characterization of the injectate and the receiving aquifer and the impacts on underground sources of drinking water, the EPA cannot effectively discharge this duty.

8. The Statement of Basis states at page 14 that the permit will require demonstration of compliance with Colorado Division of Reclamation Mining and Safety (DRMS) requirements. However, there is no record of Powertech having responded to the substantial requests for additional information required by DRMS. These aspects of the proposed operation are significant, and should have been fully reviewed by EPA prior to issuing any draft permit, and certainly should be available prior to the expiration of the public comment period on the EPA permit.

EPA should require Powertech to explain the relationship between the currently applied-for EPA permit and Colorado DRMS permit requirements for this same activity. This is especially relevant where, as here, the Applicant will be required to present substantial technical and baseline characterization

evidence in order to obtain state authorization to conduct the proposed pump test. For instance, a letter dated March 31, 2009 from Mr. Allen C. Sorenson, Reclamation Specialist, DRMS to Mr. Richard Blubaugh, Powertech (USA) Uranium Inc., demonstrates the broad extent of the information that will be required as part of the state review. (attached). This includes critical pieces of information related to the protection of the hydrologic balance and protection of water quality and quantity. These requests for information from DRMS are supplemented by a December 27, 2010 letter from DRMS to Powertech (attached), to which Powertech has yet to respond. Together, these letters evidence significant information that will be required in the state permit process, and highlight the scant information currently available to EPA in the context of this UIC Class V permit (discussed herein) regarding the hydrologic balance and impacts on groundwater quality and quantity, the EPA should delay its permitting exercise to better coordinate with the DRMS in order to ensure that the EPA has sufficient evidence to draw rational conclusions with respect to the applicant's ability to comply with the SDWA and EPA regulations. Failure of the applicant to provide sufficient information to allow the EPA to draw such rational conclusions would violate the APA.

The DRMS also expresses its requirement that the Applicant provide the location information for all wells within two miles of the proposed operation, including not just Powertech wells but also any other wells historically drilled in the area. These old wells may indeed present significant problems with respect to protecting underground sources of drinking water. The EPA's 1980 Statement of Basis and Purpose (National UIC Program Docket Control Number D 01079) provides a clear description of the problem, at pages 14-15:

One of the common ways by which fluids can enter an underground source of drinking water is by migration through improperly abandoned and improperly completed wells. This would occur if fluids moving laterally within an injection zone encountered an improperly abandoned or completed well, and, following the path of least resistance, flowed upward within the well until entering an overlying underground source of drinking water or overflowing onto the land surface. Because of the large number of wells drilled in the past, and because well operation and abandonment have not always benefitted from close regulatory scrutiny, contamination by this route can present a significant risk to public health.

...

[In the case of a potential problem], however, the well operator would be expected to correct it. Correcting the problem could mean that the well operator would have to plug a faulty well at his/her expense.

In this case, the EPA appears to have identified some of the prior drill holes in the area, but have not required any review of these holes. Rather, it appears EPA will only review the impact of these holes at a future time. As demonstrated by the map prepared by Powertech and altered only with respect to identifying local roadways, and entitled "Topo and Drill Hole Location Map, Indian Springs and Centennial Uranium Projects", there are literally thousands of historic wells in the areas proposed by Powertech for in situ leach uranium mining, including holes in the area proposed for injection under the Draft Permit. (Map attached as exhibit 3 to CARD's July 24, 2009 comments). In order to discharge its duties under the Safe Drinking Water Act and the APA, the EPA should amend the permit to require the applicant to provide information demonstrating that these wells have been properly abandoned in a manner that will not allow for communication between the injection area and the overlying underground source of drinking water.

The concerns with the previous abandonment of these wells are well documented. Indeed, documents suggest that many of these wells were not properly abandoned and could provide a conduit between the aquifers. For instance, a May 19, 2003 letter from Mark E. Hoffman, Project Manager for Exxon Mobil

to Tony Waldron, DRMS, regarding reclamation activities at the Indian Springs Prospecting project (attached as exhibit 4 (with attachments) to CARD's July 24, 2009 comments to the EPA) states:

Prospecting was conducted as described in three Notices of Intent to Conduct Prospecting Operations submitted to the Colorado Department of Natural Resources, Mined Land Reclamation Board, dated August 23, 1977, November 10, 1978, and October 27, 1980 (Attachment A). A total of 492 uranium exploration boreholes were drilled during this period.

...

Mr. J.J. Faulhaber, of Alternative Energy, in an interoffice memo, dated May 28, 1985 (Attachment D) summarized borehole abandonment procedures and standards for the Project. Boreholes were abandoned with drilling mud consisting of varying viscosities from the bottom of the hole to ten feet below the ground surface. Cement plugs were installed from ten feet to the surface or two feet below the surface depending upon local cultivation practices. The borehole abandonment standards varied over the course of the Project, but the most stringent standards applied to the 1980 drilling program....

The boreholes were drilled into the stratigraphic horizon that contains the Laramie-Fox Hills aquifer, a regional hydrogeologic unit that spans the base of the Laramie Formation and the top of the Fox Hills Formation. In a letter to Mr. Kenneth Holmes (Mobil), dated February 23, 1982 (Attachment E), Ms. Walker [Colorado Division of Mining] expressed concerns over the use of drilling mud in an interval of an aquifer, and the potential for contaminants in the Upper Laramie Formation to enter the Laramie-Fox Hills aquifer.

The interoffice memo referred to in this excerpt (exhibit 4, attachment D) also refers to well abandonment procedures that were done in the 1970s, before Colorado legislation passed in the early 1980s (House Bill 1195) that required more substantial protections in drill hole abandonment procedures to protect groundwater. These documents refer to use of such materials such as "beet pulp" in the abandonment procedure in wells.

Other historic documents demonstrate that other companies drilled substantially more numbers of wells in the area in the 1970s and 1980s, including Rocky Mountain Energy, who reported to the State of Colorado in 1982 that it drilled some 2,142 holes in the area, including in the section proposed for the injection permit (attached as exhibit 5 to CARD's July 24, 2009 comments). There is little data on the abandonment procedures used in these wells, but one might assume they consisted of similar techniques that were standard at the time that gave rise to the State of Colorado's concerns with respect to aquifer communication and contamination with the Mobil project wells. In any case, the EPA should require the applicant to provide all information regarding these wells, any abandonment information, and require repair and proper closure prior to any injection authorization.

In addition, the applicant's own documents demonstrate that there have been problems encountered with abandonment procedures at historic drill holes. In an August 2007 Powertech (USA) Inc. "Activity Update" (attached as exhibit 6 to CARD's July 24, 2009 comments), the company recounts its experiences in discovering and attempting to repair broken well casings that appear to have been improperly abandoned in the first instance. As stated by the applicant:

Some wells were broken off at ground surface during the intervening 20 plus years. We have attempted to locate wells with GPS system and hand digging. Some wells we could not locate this way and we used a backhoe to find the buried well. We gently raked 4 inches at a time searching for the casing. We did not break any wells with our backhoe. The photos found on some websites are actually jagged broken casings that were buried for 20 plus years.

Further, Powertech is on record in a letter dated October 16, 2007 from Mr. Richard Blubaugh, Powertech (USA) Inc. to Mr. Jim Woodward, [www.powertechexposed.com](http://www.powertechexposed.com) (except attached as exhibit 7 to CARD's July 24, 2009 comments) overtly recognizing the problems associated with historic well abandonment procedures in defending assertions that it or its contractors were responsible for leaving open well casings:

While these open well casings are on property owned by Powertech, these are not wells that were drilled by Powertech or its contractors. In fact, the wells left unprotected were drilled by previous exploratory efforts in the 1980s, and were uncovered by Powertech's geotechnical teams while in the process of locating each bore site.

In response to these local community concerns with respect to the potential failures of historic well abandonment, the applicant affirmatively committed to "ensuring that **all wells on its properties** meet state and local safety requirements and standards." We urge EPA to hold Powertech to its promised commitments to the local community and amend the permit to expressly require the applicant to submit this additional information of proper well abandonment as part of the permit review process, and before the grant of any such permit.

The SWDA and associated regulations provide that "no injection shall be authorized by permit or rule if it results in the movement of fluid containing any contaminant into Underground Sources of Drinking Water" 40 C.F.R. § 144.1(g). In order to ensure compliance with the SDWA and EPA regulations, the applicant must present significantly more detailed evidence with respect to the existence and potential cross-aquifer communication that may result from these historic wells, and require proper abandonment be completed prior to issuing a permit for injection. However, as it currently stands, the record is insufficient to demonstrate that the applicant can achieve the protection of all USDW. As such, the strictures of the APA preclude the issuance of a permit in this case until the applicant can provide sufficient evidence demonstrating the ability to comply with applicable law.

9. The permit should be amended to require complete reporting of water quality data encountered before, during, and after the pumping and injecting. While any approved pump test is ongoing, should any communication between aquifers be encountered, the permit should include a provision for re-assessment of the viability of injection pursuant to the permit as this new information would be critical to protecting underground sources of drinking water. Should such cross-communication be discovered, the existing permit should be suspended or voided pending additional review by the EPA.

10. EPA should amend the permit to require submittal of, and EPA and public review of, relevant data from prior pump tests conducted by the applicant in the same geologic formations. EPA may not simply refuse to consider relevant and available information. This is particularly true where, as here, the application documents specifically rely on that information as a basis for its demonstration that it will protect USDWs.

In its permit application, Powertech specifically and expressly relies on a report produced by Petrotek Engineering Corporation in support of Powertech's Class V application for a demonstration that its activities would not endanger drinking water quality. Although Powertech relies on the Petrotek conclusions in making its assertions regarding the hydraulic conductivity of the A2 sandstone, the record is devoid of any of the underlying data upon which the Petrotek conclusions were based. The federal Administrative Procedure Act requires that the record contain all relevant data upon which a permit is based – for both the benefit of agency review as well as public review. The data from the prior pump tests is relevant because the applicant specifically relies on that data in its application, and those

prior pump tests were conducted in the same area and in the same geologic formations as the proposed pump test.

The EPA is expressly authorized to require submittal of this relevant pump test information pursuant to 40 CFR § 144.27. Indeed, although drafted prior the finalization of the complete Class V regulatory program, the EPA's Statement of Basis and Purpose for the agency's Underground Injection Control Regulations issued by the EPA's Office of Drinking Water (May, 1980; National UIC Program Docket Control Number D 01079) demonstrates the need for EPA review of this information based on potential problems that can occur where injectate containing contaminants is injected above or below an underground source of drinking water and the geologic information is lacking:

[I]f the confining stratum which separates the injection zone from an overlying or underlying underground source of drinking water is either fractured or permeable, the fluids can migrate out of the receiving formation and into the protected region.

For obvious reasons, **there are no well construction standards which can address this problem** of migration of fluids through this pathway. Consequently, the regulations propose two provisions to assure that fluids do not travel this pathway into underground drinking water. First, the regulations require that, prior to the issuance of a permit, the geologic characteristics of the injection zone and confining strata be reviewed. Data already available from the states can assist Directors in making these reviews. A permit should only be issued upon the Director's finding that the underground formations are sufficiently sound to contain fluids in the injection zone.

Statement of Basis and Purpose for the agency's Underground Injection Control Regulations issued by the EPA's Office of Drinking Water (May, 1980; National UIC Program Docket Control Number D 01079), at 13-14 (attached as Exhibit 7 to CARD's July 24, 2009 comments).

11. While the draft permit appears to require that some results of the proposed aquifer-pump test be submitted to EPA for review before EPA authorizes injection, the current language in the permit is insufficient. The draft permit requires only that the applicant submit "pump test results." This appears to be a vague reference. Instead, the permit should require all results be submitted, including all analytical results, and not a simple summary of the data as interpreted by the Applicant.

Regardless, a requirement of submittal of new pump test data is inadequate, as this information will presumably be submitted and then reviewed by EPA without any public review or further ability for comment, thus depriving the public of any meaningful opportunity to raise concerns or otherwise question the results. Such a tactic of requiring such important and determinative information to be considered outside of the normal public process effectively eliminates public participation in the permitting process. The draft permit should be amended to require public comment and review of the any pump test results prior to reinjection.

Given the complexity of these issues, CARD continues to express a high level of concern with the proposed reinjection activities, and based on the current record urge the EPA to deny the proposed permit. At minimum, given the extensive amount of data and information that the EPA requires (as identified herein) in order to process the proposed permit for injection, we hereby request that the permit be amended to provide an additional public comment period to facilitate review of any amended Draft Permit or Statement of Basis and Purpose that may be forthcoming in the future. We understand that such additional review is not uncommon, and given the controversy surrounding the impacts associated with Powertech's proposed activities, is entirely appropriate. In addition, we are currently conducting ongoing research into such things as historic drilling records in the area, and reserve the right to

supplement these comments should additional relevant information become available. Lastly, we hereby incorporate herein by reference all of the public comments submitted in this comment period, to the extent these comments address issues or detail facts or evidence not included herein.

We look forward to reviewing the EPA's responses to these enumerated comments, and please do not hesitate to contact me directly with any questions regarding these comments.

Sincerely,

/s/ Jeffrey C. Parsons

Jeffrey C. Parsons  
Senior Attorney  
Western Mining Action Project

On behalf of  
Coloradoans Against Resource Destruction