


United States Nuclear Regulatory Commission Official Hearing Exhibit	
In the Matter of:	POWERTECH USA, INC. (Dewey-Burdock In Situ Uranium Recovery Facility)
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APP-068

July 15, 2014

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD**

**Before Administrative Judges:**

**William J. Froehlich, Chairman  
Dr. Richard F. Cole, Special Assistant  
Dr. Mark O. Barnett, Special Assistant**

In the Matter of:	)	
POWERTECH USA, Inc.	)	
(Dewey-Burdock Project	)	Docket No. 40-9075-MLA
In Situ Uranium Recovery Facility)	)	ASLBP No. 10-898-02-MLA-BD01
	)	
	)	

**ANSWERING TESTIMONY OF DOYL FRITZ**

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## 1. CONTENTION 4

Q.1. The initial written testimony of Ms. Susan Henderson states, “Of grave concern to me is the potential for Powertech to use vast amounts of water, (8500+ gallons per minute for 20 years)” (Exhibit INT-007 at 3). Similarly, the initial written testimony of Dr. Robert Moran states that, “The applicant will use and contaminate tremendous quantities of ground water, thereby preventing / restricting the use of these waters by others” and “Powertech has applied for water from the Inyan Kara: 274.2 ac-ft of water **annually** at a rate of 8500 gpm = 12,240,000 gpd (gallons per day) = **4.5 Billion gallons per year = 89.4 Billion gallons over 20 years**” (Exhibit OST-1 at 26, emphasis is from quoted source). Dr. Moran continues to use these figures in his PowerPoint slide presentation (Exhibit OST-5 at 17). Do you agree with the characterization of water use for the Dewey-Burdock Project as a vast or tremendous amount of water as stated in this written testimony?

A.1. Absolutely not. First of all, as stated in my initial written testimony (Exhibit APP-046 at A.8), the Dewey-Burdock Project will not divert 8,500 gpm. Because about 98% of the water will be recirculated, the net diversion rate from the Inyan Kara aquifer will only be up to 170 gpm. The gross diversion rate is irrelevant – only the net diversion rate will have any effect on the water availability in the aquifer. The impact studies conducted by the applicant, the NRC staff and the South Dakota Department of Environment and Natural Resources (SDDENR) (see references in A.10 of my initial testimony) all show that drawdowns in the Inyan Kara will be minor (10 to 12 feet at the license boundary) and will recover within about one year after ISR operations cease. SDDENR also concluded, as stated in my initial testimony at A.20, that annual withdrawals will not exceed annual recharge, and impacts to major springs and caves are not anticipated.

The amount of water to be used is not “vast” or “tremendous” relative to water available in storage or annual recharge to affected aquifers or by any other measure used to determine the magnitude of impacts. To keep claiming that Powertech will divert 8,500 gpm from the Inyan Kara is either dishonest or indicates an inability to understand the facts in this case. Exhibit APP-069 at 1 (Figure 1) provides a copy of slide 17 in Dr. Moran’s slide presentation (Exhibit OST-5) that shows how the slide should be revised to give a true representation of the actual diversion rate from the Inyan Kara aquifer as proposed by Powertech. As shown, Dr. Moran’s slide overstates the water diversion rate by a factor of 50 times the actual proposed maximum diversion rate.

My initial written testimony at A.12 describes a water right requested by Dayton Hyde, one of the intervenors in this hearing. This water right, which was approved by SDDENR in 2008, allows for the use of up to 278 ac-ft per year for the irrigation of 139 acres using a center pivot system (Exhibit APP-049 at PDF page 3). The consumptive use rate for that permit, expressed in the same units as this allegation, allows for use of up to 90.6 million gallons per year, which is slightly more than what has been requested by Powertech and recommended by SDDENR for approval from the Inyan Kara aquifer for the Dewey-Burdock Project. Sufficient water to irrigate 139 acres is generally not considered to be a “tremendous” or “massive” amount

of water as has been characterized by the intervenors in this proceeding. Exhibit APP-069 at 2 (Figure 2) shows two center pivot systems that exist within 8 miles northwest of the Dewey-Burdock Project area. Exhibit APP-069 at 3 (Figure 3) shows numerous pivots near Oral, South Dakota (about 30 miles east of the Dewey-Burdock Project area). I am not aware of outcries about “massive” or “tremendous” volumes of water used by these systems or impacts that have occurred as a result of these irrigation systems. The amount of water to be used by the Dewey-Burdock project is not massive or tremendous in the context of water availability, annual recharge to the aquifer, amount of water in storage in the aquifer, or typical other water uses in the area.

Q.2. Do you agree with the statement in Dr. Moran’s initial testimony that, “The FSEIS relied on an inadequate and unreliable analysis of water use, and failed to provide a water balance” (Exhibit OST-1 at 27)?

A.2. No. As stated in my initial testimony at A.6 and also in the NRC staff’s initial testimony (Exhibit NRC-001) at A4.5 and Hal Demuth’s initial testimony (Exhibit APP-013) at A.40 through A.44, there was no failure to provide a water balance. Groundwater use was a primary focus of the June 2011 TR RAI responses (Exhibit APP-016-A through 016-BB), including provision of a project-wide water balance in support of the discussion on handling liquid waste (P&R-14(c), Exhibit APP-016-B at 68-73). That RAI response provides a detailed description of the quantity of water anticipated to be used from the production zone aquifer (Inyan Kara) and from the Madison aquifer (primarily for groundwater restoration) during production and groundwater restoration operations. Much of this information was incorporated into the FSEIS (i.e., Sec. 2.1.1.1.3.3 and Figure 2.1-14). The water balance provides detailed information on production rates, aquifer bleed rates, reinjection rates, makeup water rates, and liquid waste disposal rates for the operations and aquifer restoration phases of the Dewey-Burdock Project.

Q.3. Dr. Moran goes on to state that the water balance provided in the license application is inadequate because, “It lacks basic components of a water balance, including detailed, measured data for volumes of water entering the system and losses (e.g. volumes of ground water available in the various aquifers ...)” (Exhibit OST-1 at 27). Do you agree with this statement?

A.3. Absolutely not. As noted by Hal Demuth in his initial testimony at A.44, there can be no “measured data” of the water balance until after operations commence (see also NRC staff’s initial testimony at A4.16). Also, the “volumes of ground water available in the various aquifers” have no bearing on the process water balance. In this context, the water balance is a measure of the use of the water, not its availability, and is a necessary step in determining how much water to apply for in the water right permit applications. The volume of groundwater available in the various aquifers to meet the process water needs without adversely impacting other water users is thoroughly addressed in Powertech’s water right applications and accompanying reports as described in my initial written testimony (e.g., A.10 and A.15 through A.20). That testimony summarizes information from the application documents indicating that potential drawdowns in

the Inyan Kara will be small (less than 12 feet at the license boundary), water levels will recover within about 1 year after operations cease, and the Inyan Kara can sustain the maximum proposed pumping rate without exceeding aquifer recharge and without adverse impacts to other water users or regional springs. It is also noted in my initial written testimony at A.10 that NRC staff's independent analysis of potential drawdowns in the Madison aquifer using a 3-layer model showed that the proposed project is not likely to affect the operation of the Edgemont water supply.

Q.4. Dr. Moran states, "The Petrotek model wrongly assumes that none of these secondary geologic features transmit water, thus the flow rates are questionable, as would be the changes to water quality resulting from long-term dewatering of the various sand and shale formations" (Exhibit OST-1 at 24). Do you agree with this statement?

A.4. Of course not. This testimony is based in part on the incorrect assumption that the various sand and shale units will be dewatered. Dewatering of the various units is not part of the ISR process and in fact the ISR process will only work if the units remain saturated so the fluids can flow through the units and remove the uranium. This testimony indicates that Dr. Moran does not understand how the ISR process works.

Q.5. In his initial written testimony, Dr. Moran states, "Referring to the Inyan Kara waters, the FSEIS states that consumptive use will be relatively small as only 2 percent of the water will be disposed of as liquid waste (assuming UIC option is accepted). However, this estimate clearly neglects the fact that much of the water from either aquifer will have been contaminated, and that the water undergoing land application will be lost via evaporation / evapotranspiration. In either case, this water is no longer available for present or future uses within the exempted aquifer zone. Clearly, the SEIS under-estimates the volumes of water that are lost or contaminated through these processes" (Exhibit OST-1 at 27). Do you agree with these statements?

A.5. Dr. Moran continues to err on this point. The amount of water that will be consumed by evaporation and evapotranspiration is included in the disposal stream in the water balance provided by Powertech and does not represent additional consumptive use. After the ISR process is completed, water levels will recover to pre-operational levels within about one year, as shown in the Petrotek digital modeling report (Exhibit APP-025). The water quality in the affected Inyan Kara aquifers will be restored in accordance with NRC license requirements before the financial assurance is released. It will therefore not be "contaminated" as stated in this comment. Thus, there will be no "volumes of water that are lost or contaminated through these processes" after the ISR and mandatory aquifer restoration processes are completed.

## **2. CONTENTION 6**

Q.6. Have you prepared answering testimony in response to written testimony provided by the intervenors on Contention 6?

A.6. No. Neither the Oglala Sioux Tribe nor the Consolidated Intervenor submitted testimony on Contention 6. Therefore, my answering testimony responds to allegations made by the Tribe in their initial position statement and testimony submitted by NRC staff for Contention 6 (Exhibit NRC-001).

Q.7. The Tribe alleges that the FSEIS “Simply list[s] the mitigation measures, and assert[s] that they may be successful in eliminating or substantially reducing the Project’s adverse impacts, with no scientific evidence or analysis to support those claims” (Tribe Initial Position Statement at 31). On the other hand, NRC staff assert that they “evaluate[d] the effectiveness of mitigation measures by explaining how these measures will avoid or reduce [potential impacts] in various environmental areas” including doing this “repeatedly throughout Chapter 4 of the FSEIS” and also in Chapter 2 (Exhibit NRC-001 at A6.4). In your opinion, who is correct?

A.7. NRC is correct. This is also discussed and confirmed in my initial written testimony at A.21 through A.25. In particular, A.22 gives 16 specific examples of where the FSEIS addresses the implementation and effectiveness of each mitigation measure. In addition, A.23 gives at least 37 specific references throughout the license application where mitigation measures are described. Further, A.24 explains where the air quality measures that are summarized in Tables 6.2-1 and 6.3-1 of the FSEIS are more fully described, and A.25 explains that it will not be necessary to mitigate areas on site which receive radioactive waste because no such wastes will be disposed on site. A.24 also points out 7 locations in the FSEIS where land application mitigation measures are described and lists 6 locations in Powertech’s GDP and LSM permit applications that describe specific mitigation measures that have been developed by Powertech and reviewed by SDDENR staff.

Q.8. The Tribe alleges that, “The current mitigation measure discussion consists of a multi-page chart which simply lists a series of proposed mitigation measure[s], with no elaboration or other analysis of how the operator expects to accomplish these items, or the expected effectiveness/limitations of each measure” (Tribe Initial Position Statement at 37). In contrast, NRC staff state that they “evaluated all the mitigation measures proposed by Powertech before assessing the environmental impacts of the Dewey-Burdock Project” including “discuss[ing] these measures throughout Chapter 4 of the FSEIS, and ... summariz[ing] these measures in Chapter 6 for ease of reference” (Exhibit NRC-001 at A6.5). In your opinion, who is correct?

A.8. NRC is correct. Again, this is discussed and confirmed in my initial written testimony at A.21 through A.25. As summarized in A.7 above, there are numerous locations in the FSEIS and various license application documents that describe the implementation and effectiveness of proposed mitigation measures.

Q.9. Do you agree with the NRC staff’s assertion that CEQ regulations at 40 CFR §§1502.14(f), 1502.16(h) and 1505.29(c) “do not require that measures have succeeded in the

past in order for an agency to consider them as a means of mitigating impacts” (Exhibit NRC-001 at A6.12)?

A.9. Yes. If this were not true, there could be no innovation or adoption of new technology in any endeavor under the auspices of NEPA.

### **3. CONTENTION 9**

Q.10. Have you prepared answering testimony in response to written testimony submitted by the Tribe or Consolidated Intervenor on this contention?

A.10. No. As with Contention 6, I am not aware that any written testimony was filed by the intervenors on Contention 9. Therefore, my answering testimony has been prepared in response to allegations in the Tribe’s initial position statement and to NRC staff’s initial written testimony in Exhibit NRC-001.

Q.11. The Tribe argues that the NRC Staff failed to analyze certain connected actions to the extent required under NEPA. For example, the Tribe in Contention 9 asserts that “the FSEIS fails to conduct any NEPA analysis” of the proposed Class III and Class V injection wells (Tribe Initial Position Statement at 38). Do you agree with this statement?

A.11. No. This assertion is based in part on a misleading assumption that a NEPA analysis is required in order for EPA to permit the injection wells. As noted in my initial written testimony at A.27, 40 CFR 124.9(b)(6) specifically precludes the preparation of an EIS in conjunction with a UIC permit. While no separate NEPA analysis was conducted specifically for the UIC permit application, as stated in my initial written testimony at A.27 and NRC staff’s initial testimony (Exhibit NRC-001) at A.9.1, EPA was fully engaged in the license application process and NRC’s NEPA analysis. Chapter 4 of the FSEIS includes an evaluation of the impacts of disposal via Class V injection wells for each resource area during each of the four lifecycle phases of a uranium ISR facility. For example, page 4-69 of the FSEIS states: “EPA will evaluate the suitability of the proposed deep injection wells and will only allow deep well injection if the waste fluids can be suitably isolated in a deep aquifer.” This helped enable NRC staff to determine that the potential environmental impact from the Class V injection well disposal option on targeted deep aquifers below the production zone aquifers will be SMALL. Specific impacts from disposal via Class V injection wells were addressed at pages 4-100 through 4-102 of the FSEIS.

Q.12. The Tribe also asserts that “the FSEIS simply defers analysis of the potential impacts ... to South Dakota permitting processes” for the NPDES permit that will set limits on the amount of pollutants entering stream channels (Tribe Initial Position Statement at 39-40). In response to this allegation, the NRC staff state that, “Powertech must obtain construction and industrial stormwater NPDES permits in accordance with regulations issued by the South Dakota Department of [Environment] and Natural Resources. The NPDES permit requirements control the amount of pollutants discharged into surface water, including streams, wetlands, and lakes”

(Exhibit NRC-001 at A9.4). The NRC staff also state that, “As part of the NPDES permit, Powertech will have to implement a stormwater pollution management plan. This plan will require that Powertech detain and treat stormwater runoff to ensure that the runoff does not contaminate surface waters and wetlands” (Exhibit NRC-001 at A9.6). Is it your understanding that Powertech will have to obtain construction and industrial stormwater NPDES permits for the Dewey-Burdock Project?

A.12. Yes. This is another required permitting action and is discussed in my initial written testimony at A. 28 and NRC staff’s initial testimony (Exhibit NRC-001) at A9.4 and A9.7.

Q.13. Are you familiar with stormwater NPDES permits and associated stormwater pollution management plans?

A. 13. Yes. The firm for which I work, WWC Engineering, has prepared, submitted and secured numerous permits for NPDES and stormwater pollution prevention plans for a variety of industrial clients over the past 20 years or more. I have personally prepared, supervised preparation of and/or reviewed several such plans.

Q.14. Can you comment on the nature of mitigation measures for protection of surface waters that you would expect to see in a stormwater pollution management plan?

A.14. Yes. Such measures are discussed in NRC staff’s initial written testimony (Exhibit NRC-001) at A9.4, which references related information in Chapter 4 of the FSEIS, and in my initial written testimony at A.28, which lists 12 specific mitigation measures and describes where they are discussed in the FSEIS. Although these permit applications will be submitted at a later date, their general content is widely accepted and they will conform with the analysis and discussion included in the FSEIS.



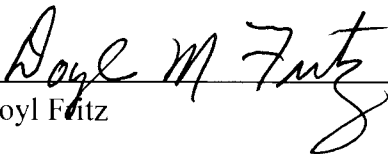
**UNITED STATES OF AMERICA  
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**BEFORE THE ATOMIC SAFETY AND LICENSING BOARD**

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(Dewey-Burdock Project	)	
In Situ Uranium Recovery Facility)	)	

**AFFIDAVIT OF DOYL FRITZ**

I declare under penalty of perjury that my statements in prefiled Exhibit APP-068 (Doyle Fritz Answering Testimony) are true and correct to the best of my knowledge and belief.

  
\_\_\_\_\_  
Doyle Fritz

Executed in Sheridan, WY  
this 15 day of July, 2014