

United States Nuclear Regulatory Commission Official Hearing Exhibit	
In the Matter of:	CROW BUTTE RESOURCES, INC. (License Renewal for the In Situ Leach Facility, Crawford, Nebraska)
	ASLBP #: 08-867-02-OLA-BD01
	Docket #: 04008943
	Exhibit #: INT-070-00-BD01
	Admitted: 8/18/2015
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	Identified: 8/18/2015 Withdrawn: Stricken:

INT-070

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
CROW BUTTE RESOURCES, INC.) Docket No. 40-8943
) ASLBP No. 08-867-02-OLA-BD01
(License Renewal for the)
In Situ Leach Facility, Crawford, Nebraska) June 8, 2015

REBUTTAL STATEMENT OF MICKEL WIREMAN

The following key points comprise my statement:

(a) In my opinion there is still too much uncertainty about the White River structural feature (fold /fault) and how it may affect groundwater flow in the Basal Chadron. The characterization presented by CBR and NRC is not sufficient to clearly identify this feature and conclude that there will be no unwanted migration of contaminated groundwater into the overlying upper Chadron and / or lower Brule. The modelling effort used by the NRC to analyze risk associated with this structure is too qualitative and lacks sufficient data to adequately characterize groundwater flow in the vicinity of the structure. More work needs to be completed to clearly identify and characterize the structure (fault or fold?) and evaluate the potential for preferential groundwater flow paths. The work needs to generate empirical data based on drilling or geophysical techniques.

(b) The hydraulic characterization of the upper confining unit is inadequate. Only two of the aquifer tests performed between 1982 and 2006 included a monitoring well in the upper confining unit. Given the size of the mined area, the spatial heterogeneity of lithologies and the presence of extensive fracturing and significant faulting in the rocks which comprise the upper confining unit, the tests were not adequate for characterizing the potential for unwanted movement of ground water from the Basal Chadron upward into the upper confining unit. The aquifer test data were not appropriately analyzed and no data analysis methods

were used that are appropriate for non-Darcy flow in fractured rock settings. During the 1987 pump test, water level changes were measured in the only monitoring well completed in the upper confining unit. CBR concludes that this was due to barometric pressure changes during the test, however this change in water level could have been due to pumping the Basal Chadron. In addition, there is insufficient characterization / description of the hydrology of the upper confining unit. Characterization should include determination of recharge and discharge areas, identification of high permeability lithologies and zones of enhanced secondary permeability and determination of water types and isotopic chemistry. Locations of monitoring wells in rocks overlying the Basal Chadron should be justified based on hydrogeologic criteria.

(c) The hydraulic properties and groundwater flow in the Brule aquifer is not adequately characterized. There is no water table/ potentiometric map for this aquifer. The direction of groundwater flow is apparently not known with a certainty as it reported to flow in numerous directions in the various reports and technical documents. Groundwater in the aquifer is hydraulically connected to the White River and likely to Squaw Creek and English Creek. It is important to identify the location of gaining and losing reaches of the White River and the temporal nature of base flow and stream loss to the shallow aquifer. To better estimate hydraulic properties of the Brule aquifer, a series of time-drawdown / distance drawdown aquifer tests should be conducted in areas where well yield is known to be high and in areas that have been mapped as having significant fracturing / faulting.

(d) The water resource monitoring program currently being conducted by CBR is inadequate. There should be established monitoring sites for the alluvial aquifer along the White River, sampling of the White River should be included and, uranium should be included as an indicator parameter for excursion monitoring in addition to chloride, total alkalinity and conductivity. There should be a Basal Chadron monitoring well located near Crawford to monitor the decline in the potentiometric surface as a lowering of the potentiometric surface will affect well yields. This is especially important to monitor changes in the Basal Chadron potentiometric surface that may result during groundwater restoration activities.

(e) Groundwater restoration efforts at the CBR facility have been problematic and inadequate. The time required to meet applicable standards has been

significantly longer than anticipated and, in my opinion, ACLs have been approved for too many parameters. In 2009 CBR adopted a modeling based groundwater restoration (MBRP) method to help achieve better restoration. However there still seems to be significant uncertainty regarding the number of pore volumes that need to be removed /replaced for a given mine unit; how / where to best deliver treated water within the mine unit being restored and how much groundwater needs to be treated to assure stabilization. The unexpected problems encountered in achieving adequate restoration could be due to an inadequate understanding of groundwater flow in the Basal Chadron and may indicate that groundwater flow is controlled by significant heterogeneity within the Basal Chadron. The MODFLOW model used in the MBRP was used to better characterize groundwater flow conditions. To help understand why previous

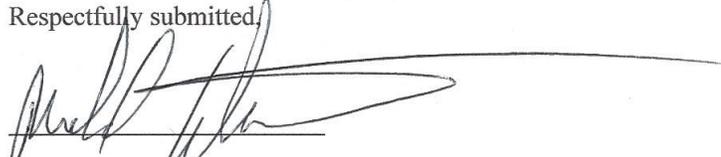
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restoration could be due to an inadequate understanding of groundwater flow in the Basal Chadron and may indicate that groundwater flow is controlled by significant heterogeneity within the Basal Chadron. The MODFLOW model used in the MBRP was used to better characterize groundwater flow conditions. To help understand why previous restoration effort have not been fully successful, more information should be provided regarding the restoration efforts at mine units 1 and 2. In my opinion compliance should not be determined based on mine unit average. Instead compliance should be based on achieving applicable standards at key compliance wells.

Pursuant to 10 C.F.R. § 22.304(d) and 28 U.S.C. § 1746, I declare, under penalty of perjury, that the foregoing is true and correct to the best of my knowledge and belief.

Dated this 8th day of June, 2015.

Respectfully submitted,



Mickel Wireman