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)	)	December 11, 2015

THE OGLALA SIOUX TRIBE AND CONSOLIDATED INTERVENORS JOINT REPLY TO NRC STAFF AND CBR

The Oglala Sioux Tribe and Consolidated Intervenors[1] hereby jointly reply to NRC Staff's and CBR's Proposed Findings of Fact and Conclusions of Law.

INTRODUCTION

The Licensee/Applicant, CBR, submitted its License Renewal Application in 2007 which sparked the 8-year odyssey now reaching its conclusion. By granting CBR its license after such a lengthy delay, the NRC Staff has given CBR a 17-year license based on an LRA so dated that had it been granted immediately, its successor would be

[1] Western Nebraska Resources Council ("WNRC"), Owe Aku/Bring Back the Way, Debra White Plume, Beatrice Long Visitor Holy Dance, Joe American Horse & Tiospaye, Thomas Cook, Loretta Afraid-of-Bear Cook & Tiwahe. Debra White Plume, Beatrice Long Visitor Holy Dance, Joe American Horse and Loretta Afraid-of Bear Cook are members of the Oglala Sioux Tribe (the "Tribe") at Pine Ridge Indian Reservation.

due next year. It is worthy of note that this proceeding has outlasted two members of this Board.

The Oglala Sioux Tribe and the Consolidated Intervenors acknowledge, and express condolences for, the passing of Judges Richard Cole and Alan Rosenthal, in whose memory, and hopefully lasting legacy, reassert that if any one federal agency sets the standard for scientific rigor and meticulous analysis, it must be the NRC. This Agency must not forget that in addition to regulating nuclear materials in the United States, the NRC sets the nuclear regulatory standard for the world. The NEPA mandated "hard look" should be the threshold of nuclear regulatory analysis, not the goal.

BURDEN OF PROOF

As a preliminary matter, it cannot be overemphasized that the ultimate burden is on CBR to properly and fully support and sustain its application and on the NRC Staff to demonstrate full factual and legal compliance with the requirements of NEPA, the NHPA, the UN DRIP, and other laws in the preparation and issuance of the Environmental Assessment as well as its finding of no significant environment impact such that would relieve the Agency of its requirements regarding the preparation and issuance of a full environmental impact statement. "As the proponent of the agency action, an applicant has the burden of proof in a licensing proceeding. The statutory obligation of complying with NEPA, however, rests with the NRC." *In the Matter of Powertech USA, Inc.* (Dewey-Burdock In Situ Uranium Recovery Facility), LBP-15-16, 2015 WL 7444635 (April 30, 2015); *see also*, *La. Energy Servs., L.P.* (Clairborne

Enrichment Center), LBP-96-25, 44 NRC 331, 338 (1996) ("[T]he NRC, not the Applicant, has the burden of complying with NEPA."); *Metro. Edison Co.* (Three Mile Island Nuclear Station, Unit 1), ALAB-697, 16 NRC 1265, 1271 (1982) (*citing* 10 C.F.R. § 2.325) (a licensee bears the ultimate burden of proof); *La. Power & Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-123, 17 NRC 1076, 1093 (1983); *Philadelphia Elec. Co.* (Peach Bottom Atomic Power Station, Units 2 & 3), ALAB-566, 10 NRC 527, 529 (1979) (The ultimate burden of persuasion rests with the applicant and with NRC Staff to the extent the Staff supports the applicant's position).

The Oglala Sioux Tribe and Consolidated Intervenors, as Intervenors, do possess the burden of going forward on their contentions and disclosing substantive and material deficiencies in the application or the EA that demonstrate that the Applicant or the NRC Staff have failed to satisfy their burdens. 10 C.F.R. § 2.325; *La. Energy Servs.*, 44 NRC at 338; *La. Power*, 17 NRC at 1093; *The Steamboaters v. F.E.R.C.*, 759 F.2d 1382, 1392 (9th Cir. 1985) (hydroelectric facility); *P.S.C. of Colo. v. Andrus*, 825 F.Supp. 1483, 1495 (D.Idaho 1993) (spent nuclear fuel). In other words it is not the Intervenors' burden to prove that the renewal should not be issued, only that the Applicant and the NRC Staff have failed to prove that it should be issued. *Id*. "The standard for determining whether to prepare an EIS is whether the plaintiff has alleged facts which, if true, show that the proposed project *may* significantly degrade some human environmental factor. The plaintiff need not show that the significant effects *will in fact occur* [the burden is on the Applicant and NRC Staff to demonstrate that they will in fact no occur], but if the plaintiff raises substantial questions whether a project may have a significant effect, an EIS *must* be prepared." *The Steamboaters*, 759 F.2d at 1392 (emphasis in the opinion)

(citations omitted). The Intervenors satisfy their burden with a showing that requires "reasonable minds to inquire further." *Vermont Yankee Nuclear Power Corp. v. N.R.D.C.*, 435 U.S. 519, 554, 98 S.Ct. 1197, 1217, 55 L.Ed.2d 460 (1978): *Pub. Serv. Co. of N.H.* (Seabrook Station, Units 1 &2), ALAB-471, 489 n. 8 (1978).

"[W]e will determine whether the agency has, *in fact*, *adequately studied the issue and taken a 'hard look' at the environmental consequences of its decision.*" *Kelley v. Selin*, 42 F.3d 1501, 1518-19 (6th Cir. 1995) (nuclear waste storage at power plant) (emphasis supplied) (citations omitted). "An agency cannot, of course, avoid its statutory responsibilities under NEPA merely by asserting that an activity it wishes to pursue will have an insignificant effect upon the environment. Courts are obliged to review the administrative record to determine whether an agency has supplied *convincing reasons* why potential impacts are truly insignificant." *Lower Alloways Creek Tp. V. P.S.E.&G. Co.*, 687 F.2d 732, 741-42 (3rd Cir. 1872) (nuclear reactor spent fuel pool expansion) (emphasis supplied) (citation omitted).

SPECIFIC REPLIES

Replies to CBR

The following specific replies are made to Applicant (all references are to paragraph numbers in Applicant's Findings of Fact/Conclusions of Law filed November 23, 2015):

4.11 CBR states that vertical hydraulic conductivity is sufficiently low to establish the adequacy of the upper confining unit - "so long as it is laterally continuous and not

penetrated by faults, or other preferential flow paths." There has been testimony that the Brule Formation and the Chamberlain Pass Formation both have significant geologic features that can function as preferential flow paths.

4.75 CBR does not accurately express Mr.Wireman's concerns about pumping related to mining causing a downward gradient. While a downward gradient between the Brule aquifer and the Chamberlain Pass Formation is advantageous for mining (by constraining upward movement of water from the Chamberlain Pass to the overlying Brule Fm.) - lowering the potentiometric surface elevation also reduces recharge from the Chamberlain Pass Formation to the White River alluvium where the Chamberlain Pass subcrops beneath the alluvium, reduces yields for water wells developed in the Chamberlain Pass Formation and reduces flow from springs and seeps which discharge from the Chamberlain Pass Formation.

4.90 Dr. LaGarry testified that the White River follows on a stretch that heads north toward Pine Ridge Reservation and follows the southwest-northeast trend of this fracture pattern….Almost all the rivers, streams and creeks follow this lineament fault pattern (HT 1173-1174). Dr. LaGarry testified that the White River follows the northwest-southeast lineament trend and then southwest of Crawford it does an almost right-angle turn and then joins the second southwest-northeast lineament trend. (HT 1174). Further, Dr. LaGarry testified that if NRC and CBR were correct, we would not see such evidence - the White River would not preferentially follow a fold. However, it will preferentially follow and preferentially erode a preexisting crack in the rock (HT 1174). Dr. LaGarry further testified that if the White River structure is a fold, it is the only fold that has been observed in the region. (HT 1185). This clearly rebuts CBR's assertion in paragraph 4.90

that "Dr. LaGarry had no testimony specifically related to the…interpretations of the White River Structural Feature advanced by Crow Butte and the NRC Staff."

Further, neither CBR nor NRC Staff has rebutted Dr. LaGarry's assertion at HT 1174 that the White River doing a right angle turn to join the second lineament trend conflicts with and undermines CBR's and NRC Staff's interpretations. Intervenors have thus prevailed on this point and further investigation should be done to determine the nature, extent and characteristics of the White River Fault/Fold. This ground truthing is especially important in light of the complete failure, on every level, of the NRC Staff's attempts at computer modeling (from the lack of competence thereof, to failure to disclose to the parties the modeling data until required by this Board during the pendency of the hearing).

4.101 - The Board should find that uranium is an effective additional tool for providing a timely alert regarding a lixiviant excursion from an ISR facility or other problems that may exist in addition to the other parameters used by Crow Butte.

Mr. Wireman testified regarding offsite testing of the 19 domestic wells, "I don't believe the 3 excursion parameters tell a complete story about any potential geochemical changes in the groundwater." (HT 1602-1603). For the excursion monitoring wells, Mr. Wireman recommends testing for uranium and radium (HT 1603). Mr. Wireman countered CBR testimony that uranium is not a good excursion parameter because of reducing conditions which render it a poor leading indicator of an excursion by saying that Mr. Wireman is not suggesting to use Uranium alone in place of the 3 excursion parameters but because it absorbs easily, if you have high uranium in an excursion well

then that means there really is an issue because of the fast absorption of uranium; it means that you've moved uranium to those wells in spite of the fact that it is retarded along the pathway (HT 1603-1604).

At that moment, Mr. Lancaster (NRC) had no answer to why uranium would not be a testing parameter to add to excursion wells to find out if there's a problem, not necessarily to detect an excursion but to see if there's a problem (HT 1605). Mr. Fuhrmann (NRC) testified that there are cases where uranium will travel at a relatively rapid rate, potentially as fast as the groundwater is moving. NRC Staff believes there's no added benefit of looking at uranium under normal conditions notwithstanding that NRC Staff believes that there's a benefit to looking at uranium in MU 6 and MU 8 because of their continual excursions (HT1607). Finally, Dr. Stritz (NRC) stated that NRC only requests the minimum necessary testing parameters to meet regulatory requirements and NRC Staff does not want to impose the extra cost on CBR of having to do uranium testing which would need to be sent to an outside lab as opposed to excursion monitoring which is done in the in-house lab (HT 1608). On behalf of the public, Intervenors object to this internal NRC Staff policy that disregards the public health & safety in an effort to save a Licensee some lab test costs. Intervenors submit that for the same reasons that uranium testing would be helpful to understand the conditions at MU 6 and MU 8, and for the reasons stated by Mr. Wireman, it is prudent and in the interests of the public health and safety, the protection of which is required by the AEA, for the Board to require testing for the presence of uranium and radium as recommended by Mr. Wireman.

4.107 - It is acknowledged that there has never been a satisfactory explanation for the presence of Lead-210 at the creeks as described in the EA.

4.131 CBR has had many, many spills and leaks even though none of them were reportable under 10 C.F.R. Part 20. These include 358 spills on site of which 3 were reportable spills to NDEQ. CBR has put water into the streams of the state in incidents involving a low of 4,000 to a high of 40,000 gallons (Teahon, HT 1557-1558). Not included in these totals are undiscovered pin hole leaks which can seep into the ground for months or years before being discovered. This is because CBR's stated method of identifying pin hole leaks is to wait for the next coincidence of a workmen being focused on the piece of pipe that has the leak and frost/freezing temperatures. The NRC finds this to be acceptable. Intervenors would prefer a system that is not so dependent on the weather and which can be able to discover leaks before they contaminant the ground for months or years. See HT 1532-1533.

4.136 - Uranium travels very rapidly - a fact acknowledged by the NRC Staff (Furhmann, HT at 1607). The rapid rate of travel was not mentioned by Mr. Lewis (CBR) in the referenced testimony. Further, this paragraph does not mention the potential harm that could be caused by lixiviant getting out between monitoring wells and traveling to the Reservation and mobilizing naturally occurring Uranium everywhere between the licensed area and the Reservation. Mr. Wireman and Dr. Kreamer testified that there was the 300,000 gallon escape of lixiviant of which only 100,000 gallons were cleaned up, reference injection well I-196 in March 1996 (HT 1563-1564). Ms. McLean testified that

a spill of that magnitude can be more toxic than Uranium because they are subject to organification by microorganisms either in the stream, in the bottom of the streams or the sediments or in the dirt and that magnifies toxicity by orders of magnitude (HT 1564). Ms. McLean further testified that once those metals are organized by microorganisms then they quickly bioaccumulate up the food chain (HT 1565).

Therefore, it is entirely plausible that contamination and health impacts are being caused to occur at Pine Ridge Indian Reservation and Chadron, and Crawford due to leaks and spills of lixiviant and travel of the lixiviant in unknown ways mobilizing naturally occurring uranium.

4.138 CBR states that the Intervenors have provided no data to suggest that uranium or other contaminants from CBR's mining operations are present in the White River alluvium. It must be acknowledged that CBR does **NOT** monitor water quality in the alluvial aquifer, thus there is no data.

4.214 The NRC Staff is guessing as to the number of pore volumes that will be needed but they basically argue that it is not relevant because CBR is licensed to use 'unlimited' amounts of water. HT at 1770-1776. Therefore, it is not possible for the NRC Staff to determine the impacts on the water resource when they may include unlimited amounts of water to be used during restoration.

Dr. Stritz testified that the number of pore volumes estimate of 'at least 11' was based on historical performance (36 for MU 1 which is the only data point for that so far) and the use of the model-based restoration numbers which estimates 4-6 pore volumes

per mine unit and CBR representations (HT 1770). Mr. Teahon testified it took between 30-40 pore volumes to get MU 2 and MU 3 to the final stages of 'stabilization' monitoring so far during 2 years of stabilization (HT 1773). Dr. Stritz testified that NRC estimated 'more than 11' but she says 'I really don't know' except to say that NRC has 'agreed to' 11 pore volumes and they think that is conservative even though it has taken 30-36 pore volumes in the past (HT 1775). Dr. Stritz testified that NRC Staff considers that the number of pore volumes is only relevant to the amount of the surety so there is no limit on the amount of pore volumes of water that might be used (HT 1776). However, the number of pore volumes is also relevant to consumptive use.

Mr. Wireman testified that Intervenors are concerned why it took so many pore volumes to restore the first 3 mining units because it might indicate heterogeneities and there's never been an explanation in the LRA or the EA as to why it took so many (HT 1776-1777). He is correct. The EA is silent as to why it took so many pore volumes to restore MU 1 and in connection with MU 2 and MU 3. This silence fails to comply with NEPA.

Mr. Wireman further testified that Intervenors are puzzled by 30-some pore volumes necessary and the model saying 4 to 6. Mr. Wireman stated that we don't understand that difference and what they've learned with the model-based system that leads to that conclusion (HT 1780). There is real time data regarding pore volumes and water use that has not been, and is not being, incorporated into NRC Staff's analysis. In the absence of evidence to the contrary, it appears CBR's model based restoration program amounts to little more than reducing the number of pore volumes and requesting higher ACLs.

4.219/4.20 CBR states that it generates 230 gpm of brine (waste) from it's Reverse Osmosis unit, and up to **300 gpm** during restoration. HT at 1460; HT at 2498. Mr. Back (NRC) testified that NRC assumed for purposes of the EA that there would be **210 GPM** of consumptive use and that the EA says it is a 'moderate' impact (HT 1460). Accordingly, the EA underestimates CBR's waste stream/consumptive use substantially; by 90 gpm or 30%. This further indicates a failure to take a 'hard look' at CBR's consumptive use and further indicates that the impact should be 'Large' and an EIS should be completed.

4.239 CBR states that "No evidence was presented to suggest drawdown within the mine site was adversely impacting others that draw water from the Basal Chadron or nearby water bodies". CBR has **not** monitored the water levels in down gradient Chamberlain Pass aquifer wells near Crawford.

4.280 Even though CBR states it has no plans currently to engage in land application, it is undisputed that land application is a permitted activity under CBR's license. Therefore, it must be considered and the evidence related to the adverse environmental impacts, particularly of Selenium, in the FWS Report and FWS Letter, are not hypothetical or speculative.

4.299 Intervenors dispute CBR's characterization of the frequent small earthquakes as being not 'significant'. Dr. LaGarry testified that because it's difficult to tell if any one

of the particular earthquakes will have an impact on what was a closed fault or fracture and then open it, all earthquakes at all times of all magnitudes should be discussed and evaluated. HT 1664. He further testified that there is evidence of a change of flow patterns in 2007 due to earthquakes in the area having to do with Chadron Creek which is fed from a spring at the base of the High Plains Aquifer and flows north. HT 1666. This was the first time to Dr. LaGarry's knowledge that the opening of a previously closed joint or fault in the local bedrock resulted in the disappearance of an entire town's water supply into the subsurface and this shows that faults and fractures do flex, open up and seismic activity is one of the possible causes so it requires serious consideration. HT 1666.

Intervenors submit that this means that the earthquakes known to occur in the area of the licensed area do cause significant impacts that should have been discussed in the EA. Dr. LaGarry also testified that joints and fractures would necessarily exist within the Chamberlain Pass Formation/Basal Chadron even though it is primarily unconsolidated; it's possible that meteoric water can dissolve weak carbonate cements, possible that local earthquakes could have faulted and fractured it, and even in unconsolidated sediment, you can find joints, faults and fractures that provide a preferred conduit for fluids. HT 1067.

Mr. Cao (NRC) testified that NRC considered close proximity earthquakes in Wyoming and South Dakota but it's not in the EA. HT 1661. Dr. Kreamer testified that items that are relevant to the issues of fractures, migration, water level changes and the like should be discussed in the EA so the public would be able to independently analyze that information. HT 1659. Dr. LaGarry testified that when things aren't included in an

EA, it's difficult for the public to evaluate whether that sort of thing is on the minds of the people writing the report so it's part of the due diligence that the public needs to see and be reassured that everything is considered and due diligence is processed. HT 1661.

Mr. Cao gave no reason why NRC doesn't put in the EA consideration of all earthquakes within a given radius from the mining activity and not just limit it to Nebraska and agreed that it would be 'common sense' to do so. HT 1661. Mr. Cao agreed that it would make more sense to set a radius away from a facility than to limit it strictly to the boundaries of a state in which the facility is located. HT 1662. This indicates that NRC applied a rigid, non-analytical approach to evaluating the impacts of earthquakes on the Crawford facility in the EA. This makes the EA flawed and non-compliant with NEPA's 'hard look' requirement and its public disclosure requirement.

Dr. LaGarry further testified that it would be worth mapping the lineaments inside the licensed area to monitor them for changes after the occurrence of an earthquake. HT 1667-1668. Mr. Teahon testified that groundwater impacts due to seismic activity created communication pathways between the mine unit and the other aquifers would not be discovered until restoration of the impacted mining unit had started. HT 1669. Intervenors submit that it is more protective of Public Health & Safety to require CBR to allow the mapping of the lineaments inside the licensed area and to monitor them for changes after the occurrence of an earthquake rather than wait until discovery of impacts much later during the restoration phase.

5.2 - Neither CBR nor NRC Staff has any idea whether or not mining fluid from Crow Butte's operations has migrated or will migrate beyond the license area or contaminate

the aquifers that supply drinking water to the Pine Ridge Reservation. Nor do CBR or NRC Staff have evidence that CBR's operations have not contaminated the drinking water at the Pine Ridge Reservation, or contaminated any drinking water between the site and the Pine Ridge Reservation. This is because CBR does not test for Uranium or the mobilization of naturally occurring Uranium by leakage of lixiviant.

5.3 - CBR has not established a convincing case for excluding Uranium and Radium testing from the testing parameters for excursions. The benefits to Public Health and Safety far outweigh the nominal additional laboratory testing costs that will be borne by CBR, which costs are simply a tiny part of the costs of doing business in the uranium industry.

Dr. Kreamer testified that the monitoring wells for excursions could reveal more valuable information if they were tested for Uranium because uranium travels differently than the other excursion parameters, it is subject to a 'rebound effect' where a contaminant is sequestered for a while and then released later or at a different rate. The 3 excursion parameters would not be a good indicator if uranium was progressively moving out to the more reducing zones, being sequestered continually and rebounding. HT 1609-1610.

Dr. Kreamer further testified that because there's a differential movement of the potential contaminants of interest and the indicator parameters, they're not the same and therefore to clean up the excursion of indicator parameters doesn't necessarily mean the spatial orientation of a potential contaminant is cleaned up as well. HT 1610. He further testified that he was concerned with the uranium that gets beyond the production well

towards the excursion well and what gets beyond the excursion well. If Uranium were to stop and get sequestered it would be sequestered beyond the excursion well and with successive oxidation, there would be a concern. HT 1610-1611. Finally, Dr. Kreamer stated he is concerned with the 40 feet beyond the active mining area as well as the oxidative zone that is created will continue to expand. HT 1612.

5.4 NRC Staff and CBR have failed to meet their burden of showing that the EA complies with NEPA and NHPA. Contention A should be resolved in favor of Intervenors.

5.5 Neither NRC or CBR has offered any explanation for the presence of radioactive Lead-210 in the area of English Creek and Squaw Creek except to simply state that Lead-210 exists there and that no one has speculated on a reason as to why it is there. CBR's procedures do not include monitoring for leaks under the lower layer of the evaporation ponds and do not include effective monitoring for pinhole leaks in pipes that leak into the ground undetected for months or years.

5.6 - CBR does not test for the organic versions of heavy metals. Dr Kraemer testified that the offsite monitoring wells are private wells that are not up to EPA standards so the offsite monitoring is likely to miss things. HT 1477. Dr. Kreamer also testified that a lot of CBR's wells have failed mechanical integrity tests and there's been leakage from the ponds with Pond 1, Pond 3 and Pond 4 having leakage detected and reported with about 6 to 8 pond leakages with the liner material and that is another surface concern with the

Brule. HT 1477. Accordingly, CBR has failed to meet its burden to prove that it is not adversely impacting subsurface waters outside the mine area.

5.7 The Board should find that more data is required to be gathered and reported by CBR to identify impacts from Crow Butte's operations to the White River, the White River alluvium, or the Brule aquifer and that an EIS is the most appropriate NEPA document for that purpose. The original license was issued based on a 'sparse' eight (8) data points of information. HT 1080. Ms. White Plume testified that the White River has been tested for uranium and arsenic and other contaminants and those have all been revealed as above MCLs so it is not merely a perception issue in regards to the White River there is data to support it. HT 1643.

Dr. Kreamer testified that there were noticeable drawdowns of 20-30 feet in the other wells in the Brule, not just Well No. 11 that is said to have a typo carried forward from 1982; the data presented from the shallow monitoring wells preferred to be looked at by CBR could represent a 'steady state' so the major drawdown from the Brule could have occurred from 1991-1998. HT 1902. Dr. Kreamer further testified that because CBR doesn't measure water levels in the 19 wells that are part of the offsite program, there is no data presented to show that those wells are still at 1982 levels. HT 1904.

Mr. Wireman testified that the hydraulic properties of the Brule formation both the upper confining unit and the overlying aquifer should be estimated based on more appropriate, more empirical, methods which use data from outcrops: fracture frequency, orientation and aperture width. HT 1095. Mr. Wireman testified there's been no direct testing of the upper Brule, no pump test done in upper Brule to estimate hydraulic

conductivity and transmissivity. In absence of pump tests, one technique is to go to an outcrop of a formation, measure aperture width of fractures, orientation, density and use an algorithm to estimate transmissivity - this has not been done; a pump test in the upper Brule would be best. HT 1096-1097.

The Board should require the foregoing additional testing and reporting to make up for the dearth of information existing concerning the impacts to the White River, the White River alluvium, and the Brule aquifer.

5.8 CBR and the NRC Staff have failed to meet their burden that the EA reflects the requisite "hard look" at the potential impacts of Crow Butte's operations on nearby surface water features. Contention C should be resolved in favor of Intervenors.

5.10 The Board should conclude that there is insufficient data regarding faults or fractures that could transmit mining fluid into aquifers that provide drinking water to the Pine Ridge Reservation to enable a scientifically valid conclusion and that more study of such faults and fractures is required. The Board requires CBR, as an additional license condition, to allow mapping of the lineaments inside the licensed area and to conduct additional pump tests that are designed to meet discover faults and fractures and their connections in and around the licensed area.

Footnote 59 - Intervenors note that there is much unknown about contaminant plumes in the area and that Mr. Spurlin (CBR)'s lack of knowledge of such a contaminant plume

does not mean that there are no impacts on the water between the licensed area and Pine Ridge Indian Reservation and on Pine Ridge Indian Reservation.

5.11 - Dr. LaGarry testified that the most likely conduit for contamination to the Pine Ridge Reservation is where the Chamberlain Pass Formation/Basal Chadron meets the White River alluvium because the White River alluvium diagonally transects the Pine Ridge Reservation from southwest to northeast. HT 1221. Having stated a plausible conduit for contamination, Intervenors have met their burden. The Board should find that such plausible conduit for contamination requires the NRC Staff to conduct an environmental justice analysis that includes the people at Pine Ridge Indian Reservation. Accordingly, Contention D should be resolved in favor of Intervenors.

5.14/5.15 Intervenors submitted several instances where there was lack of scientific due diligence on the part of CBR and/or NRC Staff concerning use of outdated concepts ('layer-cake geology', antiquated nomenclature) and failure to update to modern technology (failure to use modern hydro geology testing and monitoring methods such as down-hole TV logging, transducers, and groundwater dating). See HT 1215, 1216. Dr. LaGarry testified that use of the current concepts demonstrates due diligence and compliance with proper scientific protocols so it matters even if one characterizes the hydraulic and physical attributes of the ore body based on boreholes. For example, we recognize that the Chamberlain Pass Formation (formerly, 'Basal Chadron') had a much longer, more varied, more chemically reactive history than it was previously assumed to have when it was called the Chadron A. HT 1059.

Mr. Wireman testified that it is not terribly difficult to identify fractures in the outcrop, measure the aperture, run the numbers, get a transmissivity calculation and compare it to what the results are of pump tests to see if the pump tests are accurate. HT 1212. Dr. Kreamer testified that in the 1980s CBR did its pump tests based on assumptions that the aquifer was homogeneous, isotropic, was the same thickness, did not tilt - when it came to doing the remediation model, CBR accounted for differences in thickness of the aquifer and differences in heterogeneities. HT 1208. This shows CBR has adopted new technologies and theories when it serves its purposes (such as in the Model Based Restoration Program) and has ignored such new technologies and theories when it comes to evaluating the geologic setting for purposes of determining adequate confinement.

Dr. LaGarry testified that it is standard scientific practice to demonstrate due diligence in your scholarship by using the latest research and ideas….Keeping up with recent research is incumbent on an operations like Crow Butte because how these concepts change can directly influence how they approach their extraction and restoration of deposits and how they're treated. In addition some of these fields are advancing quickly with technology. HT 1647-1648.

Mr. Wireman testified that it is very important to use new understandings because we have learned a tremendous amount about the fate and transport of contaminants in the subsurface over the last 15 years. That science has evolved tremendously….It's critical to use the most recent research, most recent understandings and apply them to the problems at hand. HT 1648-1649.

Ms. McLean testified that CBR is not using the technology that's been developed a long time ago, and NRC Staff is not requiring that technology be used by CBR such as speciation of the inorganic heavy metals in order to be able to understand bio-accumulation. HT 1649.

5.18-5.22 The Board should find that NRC Staff failed to consult with the Oglala Sioux Tribe in a respectful, culturally appropriate way and, instead, forced its agenda on the Oglala Sioux Tribe in violation of the trust responsibility owed to them and in violation of NEPA and NHPA.

Dr. Redmond described a respectful, culturally appropriate manner of interacting with the Oglala Sioux Tribe and its members when he testified that, "The benefit of involving tribal elders is that they bring knowledge of the tradition, they bring their families and the cooperation of those families, and they you get several involved families and that shows that the process is being done with a good heart, and the more people who get involved who have traditional knowledge, the more likely it is that you will begin to understand what is going on as far as TCPs in the area." (HT at 1009).

Mr. Goodman (NRC) testified that NRC procedures dictate that the consultation process is supposed to start at the very start of the project planning process. (HT 2012). However, even though the LRA was filed in 2007, consultations did not commence until 2011. This proves a violation of the NRC's own procedures concerning consultation which is evidence of a failure to comply with its duties and a violation of the trust responsibility.

Dr. Nickens (NRC) testified that in his experience the best TCP survey approach is to involve tribal elders, a facilitator and provide logistics support, documentation, recording support and report preparation support (HT 2023). Despite this, the NRC Staff forced its own agenda on the Oglala Sioux Tribe when it offered a short-term site visit to be conducted during the winter with the decision to be made in a very short time frame during a tribal election. HT 2222. The proposal was designed to fail and, as such, did not comply with the NRC's obligations to the Oglala Sioux Tribe.

Proper consultations and TCP Surveys are critical because the original license was issued prior to the passage of NAGPRA and now there are more in number and more expansive protections for Native American cultural resources than was the case in the early 1980s. In addition, there were no interventions, challenges or TCP surveys or consultations done in connection with the 1998 renewal. After this proceeding, the license is renewed until 2024 so that this issue will not be revisited for at least a decade.

Mr. Catches-Enemy testified that, "What the Tribes would have done is on-the-ground survey of cultural resources with a cultural resource specialist, then confer with tribal elders, spiritual advisors, spiritual leaders, medicine people, and many of the elders are not able to walk out and survey things themselves -Tribes wanted access for meaningful period of time because they had been excluded from the sites for so many years (*sic* decades)." (HT at 2244-2245).

Mr. Catches-Enemy also testified that the Tribe feels misled by NRC Staff in that it thought the other tribes were on board with the open site approach based on NRC Staff representations and when they conferred with the other Tribes they found out the other tribes were not on board - also after the Makoche Wowapi proposal, the Tribes thought

the SOW had been finalized but in fact it had been abandoned in favor of an Oct 3 SOW by CBR. (HT at 2255-2256).

Mr. Goodman (NRC) acknowledged that OST at Pine Ridge is closest to the licensed area (HT 2295). Mr. Yellow Thunder testified that OST reservation and homelands include 4,700 square miles - South Dakota, Wyoming, Montana, Nebraska, Kansas (HT 2295-2296). He further testified that OST is also the largest tribe in the area having 32,152 people under 2010 census (HT 2296-2297). Mr. Catches-Enemy testified that OST is the largest of the seven Lakota bands (HT 2298).

Mr. Yellow Thunder testified that the NRC Staff showed total disregard for tribal customs, beliefs and way of life; pushing the Tribes into a corner; forced and rushed timelines that could not be met without disrespecting elders. (HT 2278-2279). This indicates a violation of the trust responsibility and that the NRC Staff has failed to meet its NHPA requirements.

This is the single opportunity to have done a proper TCP Survey which Oglala Sioux Tribe witness Michael Catches-Enemy estimated could take up to two years to be done right involving elders and the interested tribal members. (HT 2275-2276).

Instead, the NRC Staff have disrespected the Oglala Sioux Tribe, violated the trust responsibility owed to it by failing to treat the THPO similarly to the Nebraska SHPO when the Nebraska SHPO was provided with a complete draft of the EA and the THPO was not even notified of the September 2013 publication of the Section 106 documentation to the NRC's website. (HT 2358-2359); *See also Cherokee Nation v. Georgia*, 30 U.S. (5 Pet.) 1 (1831) ("Tribes have been "uniformly treated as a state from the settlement of our Country" and so we must continue to treat them that way").

Mr. Catches-Enemy testified that the OST did not refuse to engage in consultations; "OST have been open to communicating and having the dialogue and even sit at the table and assist NRC with their Section 106 responsibility, so we've been more than willing to be a consulting party." (HT 2136). This was not refuted by any witness for NRC Staff.

Mr. Goodman (NRC) testified that posting the draft Section 106 consultation documentation to the NRC website was part of the staff's consultation with the tribal gov't (HT 2357) even if the OST never saw it just because it was publicly posted to a website and posted to the NRC twitter feed and that such constitutes a "more than good faith and reasonable effort." (HT 2357-2358).

This Board should disagree with Mr. Goodman's view of consultation as being a one-sided website posting and 'tweeting' of notification that cultural resources documents binding on the Oglala Sioux Tribe have been posted to the NRC website without notifying the OST THPO and this Board should find that NRC Staff should have provided a copy of the Section 106 documentation by overnight mail to the OST THPO and should have provided the same information at the same time as was provided to the Nebraska SHPO. These violations of the consultation process require the NRC Staff to re-initiate proper and culturally appropriate government-to-government consultations with the OST with a view to establishing a Statement of Work that is based on the two-year time frame described by Mr. Catches-Enemy.

This Board should find that Contention 1 is resolved in favor of the Intervenors.

Replies to NRC Staff

The following additional specific replies are made to NRC Staff (all references are to paragraph numbers in NRC Staff's Findings of Fact/Conclusions of Law filed November 23, 2015):

4.6 NEPA requires a good faith 'hard look' which is judged in the light of reason. Intervenors have not suggested infinite study. Dr. LaGarry, Dr. Kreamer and Mr. Wireman made specific suggestions concerning narrowly defined additional testing and monitoring.

4.18 Mr. Catches-Enemy testified that in his opinion, a government-to-government consultation meeting occurs when there are high level officials of the NRC and of the Tribe at the meeting. (HT 2133).

5.3 The Board should deny the remainder of the NRC Staff's Motion in Limine. The Board may consider all items that it considers relevant in this proceeding and, for that reason, the remainder of such Motion is denied.

6.10 The Board should find that it is contrary to the interests of protecting Public Health & Safety under the AEA to so narrowly construe the admitted contention.

6.13 The Board should find that the monitoring program should be expanded to include monitoring for the presence of uranium and radium as excursion parameters.

FN 221 - The Board should find that the failure of the modeling concerning the White River structural feature and unknown and uncertain nature of faults and fractures at the licensed area constitute site-specific reasons for uranium to be added as an excursion parameter.

6.26 CBR and NRC Staff admit that areas contaminated by Lead-210 are being used for livestock watering and no one is doing any analysis concerning bioaccumulation of heavy metals in such livestock.

6.30 There is no leak detection system to detect leaks from the lower pond liner into the native soil. Dr. Kreamer testified that the ponds are leaking as reflected by evidence of leaks in the pond detection system at an average of about one leak per year and there is no discussion in the LRA or EA about the impacts from pond leaks; and CBR is not monitoring springs in the area. HT 1525-1526.

This Board should find that a leak detection system must be designed to detect leaks from the lower pond liner into the soil and to evaluate the impacts from pond leaks and include such a discussion in a revision to the EA or in an EIS.

6.32 The additional data provided by testing for uranium would be prudent to have with regard to all mining units, not just MU 6 and MU 8.

6.34 - 6.35 It is acknowledged that there has never been a satisfactory explanation for the presence of Lead-210 at the creeks as described in the EA. Since there has been no explanation about why there is increased Lead-210, it is not valid for NRC Staff to conclude the impacts to surface waters are 'Small'.

6.37 NRC Staff quotes NDEQ about the a 300,000 gal spill at CBR saying that according to NDEQ, "Most of the fluid would have taken the most conductive path, which is down the well and into the intended injection zone" and "the lateral extent of the affected area was less than 100 feet from the well." Approximately 100,000 gallons were pumped out of those wells over three years.

This means that 200,000 gallons are missing. NDEQ asserts, without reported measurements or support, that "most of the fluid" would have gone down well. NRC Staff does not take a position on this assertion in 6.38. The residual quantities in soils and aquifer materials are not defined, measured, disclosed, nor confirmed by NDEQ or NRC Staff. "Lateral extent of the affected area" is not vertically defined nor even areally defined, and is apparently restricted to one dimension on the observable ground surface. It further lacks any disclosed, rigorous quantitative subsurface testing. Long-term absorption into subsurface soils and porous material and potential for re-dissolution into infiltrating and downward percolating rainfall, if considered at all, is not quantified or disclosed. Distance to nearby water bodies is not reported.

6.39 – 6.41 NRC Staff states, "Although spills and leaks have occurred, water and sediment sampling in English and Squaw Creeks do not show any clear trends indicating that the spills are contaminating these water bodies."

Water and sediment sampling and aquatic and terrestrial fauna and flora uptake monitoring are clearly not at the standard required of environmental monitoring for EAs or EISs. Additionally there is no off-site sampling. The idea that no clear trends are shown in inadequate monitoring does not support the conclusion that local water bodies and associated species have not been affected by excursions.

6.42 NRC Staff states, "Dr. Kreamer also asserts that CBR's pipeline monitoring would not be able to detect small, chronic leaks, which could be sizable in the long term. CBR testified that they have not found any slow leaks to date, and a slow leak would be noticed within a year because of absence of frost on the ground in winter".

The method given by CBR for determining "slow leaks" is the periodic observation of line pressure for pressure drops, a method which cannot detect slow, but potentially sizable leaks. Its pressure monitoring is not an ASTM standard leak detection technique nor is it a monitoring technique. The non-standard, non-ASTM, yearly alternative "absence of frost on the ground in winter" is not quantitatively supported as a valid method, not challenged by NRC staff, nor is it valid where pipelines are in proximity to streams, ponds, springs, reservoirs or other water bodies that would have reduced frost in winter. Slow leaks have been observed in CBR impoundments where water levels can be visually observed at one central location, but many pipelines are underground and spread out. No criteria are listed to determine if small, frost-free springs on the property could be naturally occurring springs, or pipeline leak outfall.

6.44 NRC staff states, "The Staff acknowledged in its testimony that transport

through surface waters or migration over a distance of two miles through the shallow Brule aquifer are potential pathways for uncontained spills and leaks to reach the White River alluvium." The Staff, CBR, and Intervenors agree that the ground water flow in the Brule is to the northwest, towards the White River. This is correct and agreed upon by all. The Intervenors note that this underlines the importance and need for adequate off-site monitoring.

6.45/6.50 The Intervenors find it plausible that CBR's operations will result in spills or leaks that would reach the White River. See discussion re: CBR para 5.11 *supra*.

6.48 The NRC Staff states that the Basal Chadron/Chamberlain Pass underlies the White River alluvium along the SE part of the NTEA. NRC states that the Basal Chadron/Chamberlain Pass Fm. is "hundreds of feet deep" where it underlies the White River. No data has been presented to confirm this and, importantly, even if the Basal Chadron/Chamberlain Pass Fm. occurs at a great depth below the White River, groundwater will still move upwards from the Basal Chadron/Chamberlain Pass Fm. into the overlying alluvium if the elevation of the potentiometric surface of the Basal Chadron/Chamberlain Pass Fm. is above the water table of the alluvial aquifer.

6.63 NRC Staff states, "The aquifer pumping tests were designed, operated, and analyzed followed widely accepted practices that are incorporated into ASTM standards, such as those listed in Ex. NRC080."

The interesting phrase, "incorporated into ASTM standards" used by NRC staff,

while technically true, does not represent the criteria and the scope of approaches recommended in ASTM Guidelines, notably ASTM D 4043 – 96 Standard Guide for Selection of Aquifer Test Method in Determining Hydraulic Properties by Well Techniques. Several recommended ASTM approaches were not followed by CBR or requested by NRC Staff.

6.64 – 6.66 NRC Staff states in paragraph 6.64 that, "The Staff noted that the piezometer placed in the overlying confining unit during Test 2 showed no response, confirming that the overlying confinement behaved as an impermeable unit."

Surprisingly, two paragraphs later, in 6.66, NRC Staff asserts the opposite, "CBR responded that, for the same reasons discussed above, it is not possible to obtain hydraulic properties in the upper confinement from a pumping test."

Which is it? The Intervenors strongly disagree with NRC Staff's characterization. The single piezometer placed in one test in a single location cannot "confirm" as NRC Staff states that the entire overlying unit acts as an impermeable unit over many square miles. Both NRC's and CBR's conflicting statements assume, in direct contrast to direct observation, the lack of discontinuities, faults and secondary porosities in the what they characterize as overlying "confinement"

NRC's extrapolation presumes that the clay has no variation (an assumption which is not confirmed by well logs). This extrapolation by NRC Staff from a single piezometer does not consider the paucity of observations, nor corroborate the observed variations in the very few, disturbed, and spatially isolated clays sampled for laboratory testing. The a priori extrapolation of one measurement to several square miles does not

consider the existence of discontinuities in the unit, nor indications of faults and secondary porosities. Temporal changes in the clay's electrostatic double layer due to the introduction of sodium fluid lixiviant which weakens the bonds between clay particles is not quantitatively addressed nor is current literature cited. Contemporary approaches to determine whether the piezometer drilling, emplacement, and construction techniques could have artificially sealed the piezometer as it was emplaced in the clay were not reported as being followed, (although other wells with no response in other locations were excluded by CBR consultants from consideration, with the explanation that the well construction was lacking). No typical well/piezometer development is reported to have been conducted to remove fine material, screen clogging, or borehole wall smearing from the single piezometer.

6.65 In discussing the Intervenors criticism of, in the words of NRC Staff, "the number of wells used in the (aquifer pumping) tests, particularly the use of one response well in the Brule and (with the exception of Test 2) no wells in the upper confinement." NRC Staff states the following, "The Staff testified that the number and locations of wells in these tests were consistent with standard practice, and that NRC has based many licensing decisions on similar configurations."

The Intervenors strongly disagree. The number of monitoring wells used is not consistent with standard practice, or due diligence. Standard practice, recommended by the U.S. Environmental Protection Agency, the U.S. Department of Defense, the U.S. Bureau of Land Management, the U.S. Geological Survey, and many other federal and State agencies for site characterization is based on the principle that each site is unique,

and that it is not appropriate to use a one-size-fits-all, we-did-it-this-way-last-time approach. The truth about this site is that the Brule Formation is accepted by all parties to be significantly heterogeneous. This means that only a single monitoring well in that formation is in no way assured to be representative of the aquifer response.

6.67 NRC Staff states, "Dr. Kreamer asserted that the methods used to analyze the pumping test data were inappropriate because those methods assume homogeneous, isotropic behavior and uniform thickness, which are not present at the CBR site. However, at the evidentiary hearing, he acknowledged that the methods used by CBR are common industry accepted tests for evaluating results of pumping tests."

Dr. Kreamer acknowledged that the methods are common industry accepted tests for homogeneous, isotropic, aquifers of uniform thickness, not for situations like the CBR site where the formations are demonstrably heterogeneous, quantitatively reported as being anisotropic, and shown to be of varying thickness by well logs.

NRC staff also states, " The Staff testified that the various data analysis methods used in the aquifer pumping tests (e.g., Theis, Cooper/Jacob, Hantush) are widely used and accepted standard methods taught in hydrogeology and hydrology courses and incorporated into American Society of Testing and Materials (ASTM) standards related to aquifer testing, such as those listed in Exhibit NRC-080."

While the selected data analysis methods listed by NRC are standard for layer-cake geology and are presented in hydrogeology and hydrology courses, such as those taught by Dr. Kreamer, as first approaches at simple sites, this does not mean that they are appropriate as the only methods of analysis for the CBR site. This is proven in a

number of ways. First, these simple layer cake approaches were discarded as inappropriate by CBR in their restoration stabilization efforts by replacing these simplistic methods with a more complicated numerical modeling approach.

Second, the thicknesses of the formations are demonstrably not uniform, and additionally CBR consultants go through laborious ways to explain varying transmissivity values from pumping tests, finally concluding in one test, with a surprising and unsupported argument, that the aquifer thickness increases in all directions from a pumping well. Also, directional anisotropies clearly exist, and are quantified and presented by CBR – the formations are not isotropic. Finally, CBR's pumping test analyses show different principal directions of anisotropy for different pumping tests, demonstrating heterogeneity.

NRC Staff again uses the peculiar phrase that these simple methods are, "incorporated into American Society of Testing and Materials (ASTM) standards related to aquifer testing." As stated in 6.63 above, this interesting phraseology, while technically true, does not represent the criteria and the scope of approaches recommended in ASTM Guidelines, notably ASTM D 4043 – 96 Standard Guide for Selection of Aquifer Test Method in Determining Hydraulic Properties by Well Techniques. Many recommended approaches in ASTM 4043 and other ASTM guidance were not followed by CBR nor requested by NRC Staff.

6.68 NRC Staff apparently accepts CBR's consultants ignoring the last 2,080 minutes of the 3,780 minute drawdown test in Pumping Test Four, without additional pumping data or evidentiary support. The Intervenors do not support omitting this late time data. At 1,700 minutes into the test the a recharge boundary appears and at times the observed

water levels in monitoring wells even appear to rise. This is not consistent with CBR's unsupported conjecture that a nearby well may have shut off. Regardless, the existence of a second, undisclosed pumping well in the vicinity of Pumping Test 4 would negate the validity of the pumping test and its interpretation. NRC cites the following: *"CBR explained that a nearby well being shut off was a likely explanation."* An equally reasonable explanation of the divergence of the recorded data from expected results is that a recharge boundary was hit at 1,700 minutes, causing the divergence and slowing of the previous drawdown rates, and subsequently a nearby well turned on, masking this recharge boundary.

6.69 NRC and CBR seek to omit early time data from Pumping tests 1 and 2 which show a recharge boundary. No calculation or justification is given for omitting early data in Pumping Test 1, as the actual pumping and drawdown data for the test were not disclosed by CBR.

With regard to Pumping Test 2, particularly Figure 2.7-14 on page 2.7 (40), NRC Staff report:

"CBR determined that time data less than 37 minutes should be discarded by applying a constraint that is recommended by the authors of the method and used in commercial software packages used for this type of analysis.[355] *In addition, CBR testified that wellbore storage causes deviations in early time data, and for the well size and depths at the CBR site, those effects can last for over 20 minutes."*

The Intervenors do not agree and explained in evidentiary hearings that, according to NRC Staff and CBR's own cited reference (Kruse and deRidder), early time data later

than 5 minutes after Pumping Test 2 began (not 37 minutes) gives greater than 98% accuracy for the remaining data. Therefore only the first few minutes (less than 5 minutes) after pumping began need to be "*discarded*" under this criterion. Further, the dewatering estimate of CBR does not cite which mathematical method common in the industry was used to come up with the "*over 20 minutes*" estimate. Standard evaluation methods for estimating the dewatering effect do not corroborate CBR's estimate. Simple mathematical πr^2 (which is the cross-sectional width) times the dewatered well length, divided by the pumping rate show the dewatering effect would last only a few minutes at the most. Further, inspection of Figure 2.7-14 on page 2.7 (40), clearly shows a dewatering curvature effect lasting only about 5 minutes, after which the straight-line effect of groundwater withdrawal becomes obvious. The dewatering effect cited by NRC Staff and CBR would not manifest as the straight line which is obvious from 5 minutes-on in the Figure. In summary, neither justification by NRC Staff and CBR for omitting early data, (data which clearly show a recharge boundary and the potential for vertical flow), is consistent with proven mathematical concepts or statistical evaluation.

6.70 NRC Staff states that "the primary purpose of the aquifer tests were to demonstrate confinement not to characterize hydraulic properties." It must be noted that the method used for demonstrating confinement requires determination of aquifer properties.

6.74 In addressing Dr. Kreamer's concerns that differences in Brule Formation water levels between 1982 and 2088 show discrepancies at other locations in addition to the area near Well 11 claimed as a typo by CBR, NRC staff states,

"Dr. Kreamer asserted that "numerous well points showed drawdown in Brule from 1982 to 2008," not just a single location.[371] He later identified other wells showing discrepancies as Wells 17, 21 or 26, 24, 64, 19 and 129.[372]"

This by NRC Staff claim is not correct. Dr. Kreamer did not identify those wells, but the regions in which those wells lie. Extrapolation of known data and contouring from the 1982 data set and comparison with an extrapolated and contoured 2008 data set demonstrate these differences in water levels, in those regions, between 1982 and 2008.

NRC staff goes on to state,

"we examined Exhibits BRD008A and BRD008B and found that, of the wells Dr. Kreamer identified, only Wells 17, 24 and 64 had measured values in 1982-83. The contours in Ex. BRD008B do not extend far enough to estimate the 2008 water levels for those wells without extrapolating. Therefore, we find that these assertions of additional discrepancies are not credible."

Extrapolation and contouring of the data show these important differences in Brule water levels between 1982 and 2008. NRC accepted extrapolated and contoured comparisons where they address a claimed typo in water Well 11 in Section 6.73 above. Why they do not accept extrapolated and contoured in other CBR mining areas which show significant discrepancies between 1982 and 2008 is unexplained.

6.75 NRC Staff attempt to refute observed differences in Brule water levels between 1982 and 2008 by citing Brule monitoring well information in specific selected locations which are inapplicable to areas of concern questioned by the Intervenors. These selected, inapplicable locations: (1) have conditions where overall groundwater withdrawal in the Chamberlain Pass formation was historically small and therefore of little concern, (2) are not in the area of major discrepancy between 1982 and 2008, and/or (3) in locations were head differences between Chamberlain Pass and Brule Formations are not great and where no major head gradient would drive changes in Brule water levels. These observations, while interesting, are irrelevant to the areas of 1982 and 2008 discrepancy and locations concern. The specific areas of concern to the Intervenors and discrepancy are not the same locations discussed by NRC in section 6.75. The actual specific areas of discrepancy and concern are not addressed by NRC Staff or CBR.

6.79 NRC Staff submits that it has not seen any site specific data despite acknowledging that faults and fractures are 'ubiquitous' in the region. The term 'ubiquitous' would include the licensed area. The reason why NRC Staff has not seen any site specific data concerning such faults and fractures is that it has not required CBR to map the lineaments or to allow anyone else access to the site to map the lineaments.

6.82/6.84 The NRC Staff has aided and abetted CBR's blackout of the licensed area so as to create a vacuum of information concerning faults and fractures. There is no basis to believe that such faults and fractures are absent in the licensed area and, accordingly, the Board should find that faults and fractures are as 'ubiquitous' inside the licensed area as

Dr. LaGarry's testified that they were outside the licensed area in the same general region.

6.85-6.88 - The NRC Staff in the EA places great weight on the model it created which has now been discredited. The discredited model was created by a former NRC Staff employee but the NRC Staff for some reason was not able to even contact the former employee to find out what parameters were used. The shoddy and scientifically indefensible manner in which the model was created coupled with the failure to properly disclose the modeling data in this proceeding until order by the Board, require that the Board exercise heightened scrutiny over the NRC Staff in this aspect of the proceeding. The Board should find that that the modeling and all conclusions, assumptions and statements in the EA that relate to, refer to, or rely on the discredited model be deleted from the EA and that the EA be revised to include a complete and NEPA compliant discussion of the White River Structural Feature so as to constitute a 'hard look' under NEPA.

6.89-6.91 - The Board should find that the EA be revised to include a complete statement of all bases, assumptions, data and conclusions related to the White River Structural Feature. Intervenors have articulated a plausible pathway that involves the White River Structural Feature and their experts have testified that whether it is a fold or a fault it may conduct water. Therefore, the NRC Staff should conduct a complete NEPA compliant analysis of the characteristics of the White River Structural Feature and CBR should be required to submit an amendment to the LRA that includes a more precise description of

the geological setting in which the mining activity takes place to include the characteristics of the White River Structural Feature.

6.94-6.97 - Dr. LaGarry testified in response to NRC staff finding no evidence of faults or fractures at the CBR site which could act as permeable pathways between Basal Chadron/Chamberlain Pass Formation, sandstone aquifer and the White River alluvium or the overlying Brule aquifer, Dr. LaGarry points out that faults and joints entirely surround the license area (HT 1471-1472). NRC Staff has not refuted Dr. LaGarry's testimony on this point which is very specific.

Dr. LaGarry testified that the White River can receive contaminants from waters transmitted through the Chamberlain Pass Formation/Basal Chadron where it is exposed at the land surface and there's evidence from the 1990s where Dr. LaGarry and the Nebraska Geological Survey mapped the Chamberlain Pass Formation under the White River alluvium 12-15 miles north of Crawford at a small town called Horn. (HT 1076).

Dr. LaGarry testified that there is a widespread area of what are called lineaments representing faults and joints visible from the air and space; these are generally oriented in northwest, southeast and southwest-northeast overlapping pattern. The White River follows on a stretch that heads north toward Pine Ridge Reservation and follows the southwest-northeast trend of this fracture pattern….Almost all the rivers, streams and creeks follow this lineament fault pattern (HT 1173-1174).

Dr. LaGarry also testified that the White River follows the northwest-southeast lineament trend and then southwest of Crawford it does an almost right-angle turn and then joins the second southwest-northeast lineament trend. (HT 1174). He further testified that if NRC and CBR were correct, we would not see that - the White River would not preferentially follow a fold. However, it will preferentially follow and preferentially erode a preexisting crack in the rock (HT 1174). Neither NRC or CBR has refuted the foregoing observation by Dr. LaGarry. Further, Dr. LaGarry testified that all faults and joints are preferential pathways but how much flows and how fast it moves is only confirmable by direct observation (HT 1179). Dr. LaGarry also testified that if the White River structure is a fold, it is the only fold that we have observed in the region. (HT 1185).

Mr. Wireman testified that the White River making that turn, rivers, we see this all over the west, follow major faults….If you plot the age of a fault versus how open it is or isn't you would find that most of the younger faults are more open and more transmissive than most of the older faults and that makes some sense….so age of the fault is important. (HT 1186-1187). Mr. Wireman further testified that folds don't mean no pathways….I know areas in Wyoming where anticlines, which are folds, are highly transmissive and are areas of very focused recharge down to depths to 11,000 and 12,000 feet from the surface into an aquifer…so the NRC's deduction approach to making these conclusions needs to benefit from some newer concepts and newer paradigms (HT 1187).

Dr. Kreamer testified that it is possible to have folds with intermediate layers and some are consolidated and some are semi-consolidated but you can actually see faulting in a

fold….There are brittle places and brittle lawyers in a fold and as you bend it with geologic forces you are going to get a fold but you are also going to get a series of shorter faults within the fold and so a fold is not exclusive of having faults in it. (HT 1188). Mr. Back (NRC) did not dispute that a fold could still be a transmissive zone similar to a fault (HT 1192).

Based on the foregoing, the Board should order a license condition be added requiring CBR to conduct such direct observations within the licensed area in a manner that can be verified by Dr. LaGarry and other stratigraphers.

6.104/6.105/6.106 - The Board should find that the NRC Staff has not met its burden of showing that there are no vertical or horizontal connections due to folds, faults, fractures and/or joints and that more testing is required as recommended by Intervenors witnesses during the hearing.

Intervenors have demonstrated that there is reason to believe that there are folds, faults, fractures and joints interacting in the licensed area in unknown ways. Based on the foregoing, the Board should find that more testing and data collection and analysis is required before a valid conclusion can be reached as to whether the impacts are 'Small', 'Moderate' or 'Large.' The NRC Staff should be required to revise the EA to reflect such data and analysis and/or to do an EIS that includes such data and analysis.

Dr. LaGarry testified that the likely hydraulic connection between the license area and the Pine Ridge Reservation is northwest flow from the license area to the White River alluvium and the White River itself and then subsequent northeast flow through the modern river alluvium to connect with exposed or water table aquifer of the Basal

Chadron/Chamberlain Pass Formation and/or the Arikaree-Ogallala aquifers underlying the Pine Ridge Reservation, ref INT-080, p6. (HT 2582).

Dr. LaGarry testified that that lateral migration of contaminated water from the license area somehow around, or over, or through the Chadron Arch onto the reservation is extremely unlikely. However, once contaminants through cracks, or spills, or whatever found their way into the White River, then they would be flushed diagonally across the Pine Ridge Reservation and in short order could get from there into people's wells or into the sediments (HT 2582-2583).

Dr. LaGarry also testified that contaminated liquids from underground can be driven up by artesian flow to pop out at faults and cracks elsewhere….If I were to find faults that were transmitting liquids between and around monitoring wells and these were getting into the White River, that those contaminants could then be taken directly to Pine Ridge….or an underground network of faults could transmit fluids between and around monitoring wells to bible up through artesian flow somewhere, perhaps in southern Oglala Lakota County. So, in my opinion those contaminant pathways are much more likely than any lateral connection of the Chamberlain Pass. (HT 2585).

Mr. Wireman testified that not enough is known about the White River structure; regardless if it's a fault or a fold or what the structure is, it is likely to have an effect on that surface and what the effect is, is unknown. The concern is that combined with the pumping and the inward gradient there will be a reduction in discharge from the Basal Chadron/Chamberlain Pass Formation to whatever surface water features it must discharge to; Secondly anyone who has a water well in the Basal Chadron/Chamberlain

Pass down gradient will see a reduced yield because of reduced potentiometric thickness. (HT 2600-2601).

Dr. Kreamer testified that there is a flow route to the reservation along the White River so a contaminant can follow the flow direction at the site to the northwest, change to the north and move northeast along the White River so that it is clear the flow map goes toward the Reservation (HT 2624-2625).

The Board should find that the NRC Staff has failed to satisfy its 'hard look' and public disclosure requirements under NEPA.

6.125/6.126 - Dr. LaGarry testified that term 'layer cake' in Western Nebraska comes out of geological work done in the 1930s-early 1960s in which it was assumed that the rock layers were of uniform thickness, uniform lithology or constituency and spread out in all directions….Then, the main change that happened following the advent of plate tectonics and recognizing uplifts locally was that we now have an idea that the rocks are a hodgepodge because of the interplay between the various things that form the rocks and rather than being uniform layers, the expectation now is that they're discontinuous and pinch out and local. (HT 1069). Dr. Kreamer testified that CBR's initial calculations saying that there was no vertical hydraulic conductivity were based on assumptions of homogeneous isotropic layers that were equally thick and were more or less infinite horizontal extent as far as the pumping test was concerned. The have now abandoned those assumptions (HT 1208-1209). This means that the layer-cake theories of geology are not appropriate to the licensed area because they are based on obsolete science that has been superseded by new scientific understandings.

The Board should require CBR to update its LRA and require NRC Staff to revise the EA to more precisely and scientifically accurately describe the affected geologic setting using current scientific due diligence and current nomenclature and currently available and used technologies.

The assumptions that flow from an abandonment of the 'layer-cake' geology include the methods used to evaluate the pump tests. Dr. Kreamer testified that the Tyce, Cooper-Jacob, Hantush, Neuman and Witherspoon methods are all inappropriate for the stated field conditions, referencing INT-046, p2, because the field conditions are not homogeneous isotropic systems strata of equal depth thickness; such methods were also made for horizontal media that didn't vary or slope, contrary to the heterogeneous anisotropic nature of the licensed area strata (HT 1298).

6.131-6.133 The Board should accept Dr. LaGarry's position concerning the nomenclature. The Board should require CBR and the NRC Staff to use the designation 'Chamberlain Pass Formation (formerly, Basal Chadron) in all future documentation to indicate the historical reference and the current name.

Dr. Lagarry testified that the use of terms Chamberlain Pass Formation and the change of that term from the prior Basal Chadron term wasn't just a name change. The name was changed because the rocks were demonstrably mischaracterized when they were called the Basal Chadron. (HT 1054-1055). He further testified that a separate depositional environment, a separate episode of earth history, different volcanos, different environments, different time, different distribution - so it's not just a nomenclatural issue, it's a conceptual issue (HT 1055).

Dr. LaGarry testified that the primary reason for the name change was that the channel facies of the Chamberlain Pass Formation, formerly known as Chadron A or Basal Chadron, was considered a separate rock stratum from the overbook mudstone facies, which overbook mudstone facies was considered to be part of the underlying Pierre Shale; the name change was based on a redefinition of those rocks, a redefinition of the history of those rocks to recognize that the flood plain and channel facies were the same thing. Subsequent work from Evans and Terry and Terry (1998) demonstrated that the flood plains and the channels were intermingled, interstratified, and not the sequential, cyclic, separate character that the name Chadron A, or Basal Chadron, carried with it. (HT 1058)

Dr. LaGarry also testified that use of the current concepts demonstrates due diligence and compliance with proper scientific protocols - so it matters even if one characterizes the hydraulic and physical attributes of the ore body based on boreholes. "For example, we recognize that the Chamberlain Pass Formation had a much longer, more varied, more chemically reactive history than it was previously assumed to have when it was called the Chadron A" (HT 1059).

While proper characterization of the strata being mined would undoubtedly help CBR's mining efficiency, restoration protocols and stability are also implicated. Contemporary literature indicates that "the physicochemical meaning of observed desorption rates cannot be accurately deduced without first understanding the initial solute distribution within the media." *Effects of Initial Solute Distribution on Contaminant Availability, Desorption Modeling, and Subsurface Remediation* Nathan W. Haws, William P. Ball and Edward J. Bouwer, published in J. Environ. Qual. 36:1392–

1402 (2007).

6.170 NRC Staff state,

"Dr. Kreamer testified that "the basic equations used to describe the impacts and drawdown of water tables and piezometric surfaces in the mining area are inappropriate for the indicated heterogeneous, anisotropic conditions," and that therefore water quantity "impacts are not reasonably projected."[571] *The Staff counters that the "basic equations" Dr. Kreamer refers to "have been used in numerous ASTM standards . . . to determine aquifer hydraulic properties including application to heterogeneous anisotropic aquifers."*[572]*"*

This statement implies that ASTM standards support the use of these equations in the conditions at CBR and these equations alone are appropriate. ASTM Standards do not support their use, and the equations under CBR condition are not appropriate (see discussion in 6.63 and 6.67 above). As cited above, several analytical approaches recommended by ASTM standards were not employed by CBR.

Further, ASTM standards state that Pre-selection Procedures for choosing mathematical modeling approaches include drillers logs, geophysical surveys, and records of existing wells, none of which was disclosed to the Intervenors.

NRC Staff seemly relies on the principle that if a basic mathematical approach was used at another site with different geology, it is appropriate near Crawford, NE. (see Section 6.67 above). ASTM warns against this. Specifically, ATSM Guidance in D4043 points

out, *"Well techniques have limitations in the determination of hydraulic properties of groundwater flow systems. These limitations are related primarily to the simplifying assumptions that are implicit in each test method."* And "*This ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects."*

In Section 6.170 NRC further states,

The Staff further points out that the use of these "basic equations" have actually overestimated actual drawdowns at CBR, and so provide another conservative means to estimate drawdowns going forward.[573]*"* These methods are not conservative. NRC Staff assume the Chamberlain Pass Aquifer and the Brule Aquifer are not connected, so they do not consider the withdrawal effects on the upper aquifer and wildlife.

6.179. In Section 6,179 NRC Staff state, "

The Intervenors also argue that the EA does not consider that restored water quality may be reversed over time. Dr. Kreamer testified that "addition of reductant to sequester pollutants can be reversed with time and the continual, natural flow of more groundwater through the site."588 But in accordance with Condition 10.6 of the renewed license, CBR cannot receive final approval for restoration of a mine unit until stability monitoring demonstrates four consecutive quarters without an increasing trend in the measured constituents.589 The Intervenors do not explain why this license requirement would not protect against the risk of ground water quality reversal."

The scientific literature clearly documents the "rebound effect" in groundwater contaminant concentrations, and the U.S. Environmental Protection Agency in its regulations and guidance set up much longer rebound effect observation periods than 4 consecutive quarters. Rebound testing typical is at EPA sites. For example in ***Effects of Initial Solute Distribution on Contaminant Availability, Desorption Modeling, and Subsurface Remediation*** by Nathan W. Haws of Hydro Geo Chem Inc., and William P. Ball and Edward J. Bouwer Johns Hopkins University thr following is stated, *"Low permeability regions in which solute movement is governed by diffusion reduce the availability of pollutants for remediation and can function as long-term sources of groundwater contamination. The inherent difficulty in understanding mass transfer from these regions of sequestered contamination is further complicated by unknown solute distributions within the low-permeability regions (sequestering regions)."*

6.173 - The Board should find that the past experience of the restoration results of MU 1 is relevant to the projected restoration results of MU 2 through MU 11. Dr. Stritz testified that NRC used the results of MU 1 to project the NRC Staff's estimate of the 'more than 11 pore volumes' required for MU 2-MU 11. Dr. Stritz testified that the number of pore volumes estimate of 'at least 11' was based on historical performance (36 for MU 1 which is the only data point for that so far) and the use of the model-based restoration numbers which estimates 4-6 pore volumes per mine unit and CBR representations (HT 1770).

6.177 - NEPA's public disclosure requirements mandate that the NRC disclose to the public that CBR is not really expected to restore the mining units to baseline and that some form of secondary standard or ACL is almost certainly going to be applied. Further, the EA should state that there will not be a public hearing related to the setting of any ACLs because of the applicability of a categorical exclusion under NRC Regulations. None of this information is presented in the EA and, therefore, there is a violation of NEPA's requirement to disclose to the public all relevant information about the project in a clear and concise way that is understandable by the public.

6.180 The Board should find that CBR and NRC Staff have overly relied on the MBRP modeling projections and that there should be a license condition added requiring CBR to revise the MBRP to adjust it for the results of the restoration in each successive mining unit and that the MBRP shall not, in and of itself, be used as justification for CBR having used its best efforts (ostensibly by complying with MBRP) or having met the requirement for 'as low as reasonably achievable' (ostensibly by meeting the MBRP projections).

6.187 & 6.194 - The Board should find that CBR should be required to collect site-specific wind data and should be required to take measures to mitigate the impacts from tornadoes. These may include buried storage of chemical binders to be used to mitigate the spread of contaminants if the facility should be hit by a tornado.

6.195/6.196/ 6.198 - The Board should require the NRC Staff to revise the EA to include a proper tornado analysis that includes independent though greater than the 'cut and

paste' work previously put in by NRC Staff. The record, as amplified by Judge Hajek during the hearing, would still not suffice to satisfy the 'hard look' requirement because the NRC Staff refuses to accept Judge Hajek's analysis and has refused to acknowledge that there is any risk whatsoever or any mitigation that should be attempted. Therefore, this Board should order NRC Staff to include a complete analysis of tornado risks, impacts and mitigation in a revision to the EA, or in an EIS.

6.207 - This Board should find that the NRC Staff has not presented arguments or facts demonstrating that the pre-conditions for Tiering under NEPA have been met concerning the NDEQ issuance of the NPDES permit. As a result, the NRC Staff shall be required to conduct its own analysis of the impacts independent of the NDEQ work and include such NRC Staff analysis in a revised EA or EIS.

7.2 This Board should find that the EA failed to comply with the requirements of NEPA. We find that the EA fails to adequately analyze the impacts associated with the use of the excursion indicator parameters currently required by CBR's license. Further this Board should require the inclusion of Uranium and Radium as excursion parameters.

7.4 This Board should find that the NRC Staff's review of potential impacts to ground water quality, including its assessment of whether there is interconnection among aquifers, and its conclusion that such impacts would be SMALL, failed to comply with the requirements of NEPA. Further this Board should find that the NRC Staff should have applied its EJ guidance to include Pine Ridge Indian Reservation and this Board

should require the NRC Staff to prepare an EIS that contains such an expanded environmental justice analysis.

7.5 This Board should find that the NRC Staff, in its review of site geology and hydrogeology, failed to appropriately consider recent research related to geology and therefore failed to comply with the requirements of NEPA.

7.6 The Board should find that the NRC Staff's analysis of potential impacts to cultural resources failed to comply with the NHPA and NEPA. The Board should find that the NRC Staff failed to meaningfully consult with the OST on a government-to-government, culturally appropriate basis, failed to offer the OST a reasonable opportunity to identify its concerns about historic properties, to advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, and to articulate its views on the undertaking's effects on such properties. The Board should further find that the NRC Staff's TCP survey failed to constitute a hard look at the potential for impacts to cultural resources.

7.9 This Board should find that the NRC Staff should have considered the impacts of tornadoes for the reasons described by Judge Hajek during the hearing on the issues of Contention 12 and that Contention 12 is resolved in favor of Intervenors.

7.10 This Board should find that the NRC Staff failed to consider earthquakes within a reasonable radius of the facility and that the NRC Staff's policy of only considering

impacts from earthquakes in the same state as the facility regardless of distance from the facility is invalid and that the EA should be revised to include a clear and concise description of the impacts of earthquakes and the failure to include such a clear and concise description in the current EA violates NEPA.

7.11 This Board should resolve all Contentions in favor of Intervenors and require the NRC Staff to do a Draft EIS, publish it for public comment, and then do an EIS for this license renewal. Further this Board should establish license conditions to ensure better monitoring and the collection and evaluation of more data as suggested by Intervenors.

DISCUSSION REGARDING SPECIFIC CONTENTIONS

EA CONTENTION D: Environmental Justice, Failure to Take the Requisite "Hard Look"

To the extent that the NRC Staff and CBR rely upon a deficient discussion in the Environmental Assessment to support their proposed findings and conclusions, their reasoning is circular as an EA, if deficient, by its very nature can offer no support at all. Rather, the evidence submitted at the hearing requires reasonable minds to inquire further, to take a harder look, in regards to whether a significant impact on the environment "may" exist. If so, the EA is deficient.

Here, it was clear from the testimony particularly of Dr. LaGarry that there commingling of the aquifer being mined and contaminated by CBR with other aquifers and with surface waters and drainages, including the two streams that cross the site and flow into the White River and across the Oglala Sioux Reservation, may in fact exist, and

that the CBR and the NRC Staff failed to adequately explore this possibility or to discuss it in the Environmental Assessment. *See discussion and cites, OST/CI Proposed Findings of Fact and Conclusions of Law,* p. 14. It was not Intervenor's burden to show that such contaminants from CBR's activities actually have reached or may reach the Reservation, only that they might. The elevated levels of radioactive and other contaminants in the ground and surface waters on the Reservation, including elements associated with CBR's *in situ* uranium mining activities, that was the focus of Ms. White Face's and Ms. White Plume's testimonies and documentary evidence were not and are not contested by the NRC Staff or CBR. The NRC Staff and CBR only challenged – with evidence Dr. LaGarry demonstrated was both clearly incomplete and disputed – the vector for the movement of such contaminants from the CBR site to the Reservation. The evidence they relied upon was directly contradicted with other evidence that was subject to multiple interpretations, including interpretations that favored the conclusion of the past, existing, and future movement of contaminants into other sources of ground and surface water. One simply cannot make a determination of this important question with fundamentally incomplete and disputed hydrological evidence. *OST/CI*, p. 14. The very fact that the evidence is incomplete begs "reasonable minds" to inquire further as Dr. LaGarry opined, and renders the EA substantively deficient.

Since the question of whether or not contaminants from CBR's activities have been, are, or may be reaching the Reservation cannot yet be answered, the summary conclusion drawn by the NRC Staff in its environmental justice analysis in the EA that the Reservation was not within the "affected environment" is left without evidentiary support. Without such information, the required discussion of mitigation measures

cannot be had. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351-52 (1989); *also*, 10 C.F.R. § 51.103(a)(4). Within this dearth of necessary and required information, the cursory EA Environmental Justice discussion is hollow and silent, misleading, and meaningless.

It should not go unacknowledged that the Environmental Justice section of the EA also fails to discuss the disparate impacts of the CBR activities on the historic and cultural and spiritual interests of the Oglala Lakota peoples and the Tribe. As with the commingling and movement of contaminated water from the CBR site, the twin failures of CBR and the NRC Staff to satisfy the requirements of a proper and adequate historic and cultural resources survey and to properly and adequately consult with the Oglala Sioux Tribe make the environmental justice assessment of the disparate impacts upon the Oglala Lakota peoples an impossibility. Any such EJ discussion and analysis cannot be had without that information. This issue is not addressed in the proposed findings and conclusions of either the NRC Staff or CBR.

EA CONTENTION 1A: <u>Failure to Meet Applicable Legal Requirements Regarding Historical, Cultural, and Spiritual Resources</u>

The NRC Staff's and CBR's Proposed Findings of Fact and Conclusions of Law each fail to address the underlying fact that forces the determination of this issue regarding the identification and protection of historic, cultural, and spiritual resources: that all of the primary witnesses in regards to the adequacy of the NHPA / NEPA historic / cultural resources survey, Intervenor's experts, Dr. Louis Redmond [HT, 1009], and Michael Catches-Enemy [HT, 2244, 2274-76], and the NRC Staff's expert, Dr. Nickens [HT, 2023, 2276-77, 80-81], were in agreement that a proper and sufficient NHPA survey

could not be completed without the participation of the elders of the Lakota people with extended site visits by them and their families. Because, the negotiations between the NRC Staff and the Oglala Sioux Tribe and almost all of the other interested Tribes broke down, this necessary NHPA / NEPA requirement for an adequate historic and cultural resource survey was never met. For that reason alone, the conclusion cannot be avoided that no NEPA hard look was taken, and no adequate NHPA survey conducted. *See, e.g., Powertech*, 2015 WL7444635, *13-22 (pp. 642-59).

EA CONTENTION 1B: Failure to Involve or Consult the Oglala Sioux Tribe as Required by Federal Law

The consultation contention is, of course, intertwined with the historic / cultural / spiritual survey contention. Likewise, underlying this contention is the fact demonstrated in the evidence at trial, particularly through the testimonies of Oglala Sioux Tribal officials Mr. Catches-Enemy and Dennis Yellow Thunder, as well as that of the NRC Staff's witness, Nathan Goodman, that the attempts of the parties to engage in the required NHPA, NEPA, UN DRIP, consultation eventually broke down and was never completed, as is evident by the fact that no cultural / historic / spiritual resource survey was ever conducted with the participation of the Oglala Lakota peoples and the Tribe.

The "Powertech" project was also included in this failed consultation attempt along with the Crow Butte Renewal and several other pending license applications. The Powertech Board heard that matter in August, 2014, and concluded on largely this very same evidence and facts that "meaningful face-to-face, government-to-government consultation" with the NRC had not occurred and that "the consultation process between the NRC Staff and the Oglala Sioux Tribe was inadequate." *Powertech*, 7444635, *21

("Because of these facts, procedures must be put in place to assure that the required NEPA hard look is taken, the NRC's Part 51 environmental regulations are satisfied, and an opportunity for meaningful consultation is provided." *Id*. Significantly, the Board in *Powertech* ruled that: "Adequate NRC face-to-face meaningful government-to-government consultation requirements are not satisfied by large group meetings, with members of many diverse tribes, all with varying degrees of attachment to the project area. Tribal Protocol Manual, NUREG-2173, at 10." *Id.*, at 3. That same analysis, finding, conclusion, and ruling obviously applies here.

The findings and conclusions proposed by the NRC Staff and CBR wholly ignore the Board's *Powertech* determinations and rulings on largely this same evidence. Instead, they suggest that the quantity of correspondence satisfies this requirement and relieves the NRC Staff of its duty of good faith consultation. The NRC Staff and CBR ignore the evidence received by the Board at the hearing that the vast majority of those "consultations," such as leaving voice messages or sending out mass mailings, were wholly lacking in substance or importance or significance. The Board in *Powertech* addressed this as well and ruled that: "Quantity of correspondence does not necessarily equate with meaningful or reasonable consultation, and 'doesn't in itself show NHPA-required consultation occurred.' *Quechan Tribe of Fort Yuma Indian Reservation v. U.S. Dept. of Interior*, 755 F.Supp.2d 1104, 1118 (S.D.Cal. 2010)." *Powertech*, 2015 WL 7444635, *3.

The NRC Staff and CBR also ignored the evidence of the very ethno-centric and heavy-handed manner in which the NRC Staff, particularly Mr. Goodman, approached the task and the NRC Staff's total failure to honor the requests of the Tribes that they take the

lead in designing the surveys and the consultation process, including high level government-to-government consultations. *See discussion and citations*, OST / CI, pp. 29 and 32.

The fact remains that, as found by the Board in *Powertech*, no meaningful NEPA or NHPA consultation occurred with the Oglala Lakota peoples or the Oglala Sioux Tribe over the CBR license renewal application. The Environmental Assessment is therefore fundamentally flawed.

CONCLUSION

The Consolidated Intervenors and the Oglala Sioux Tribe do not dispute that CBR's parent corporation, Cameco, is among the best in the world at what they do, yet maintain that here, at the CBR facility, not enough is known about what that means. The dearth of information regarding pre-mining conditions makes an accurate assessment of mining impacts to regional waters extraordinarily difficult, if even possible. The solution is not to ignore the missing data. Rather, the Agency must compel the Licensee to gather additional information to approximate the actual baseline conditions and then assess the potential impacts of mining activity through a broader lens.

The EA based on an eight-year-old license renewal for a mine in sustained production needs to be discarded and replaced with the document NEPA requires, an EIS for a mine completely in restoration or restoration stand-by.

Nuclear regulation is no place for guesswork. It is simply not acceptable for the NRC Staff to rely to such a large extent on Applicant's representations and theories and

suggestions to the point of literally 'cutting and pasting' Applicant's typos into the NEPA document. This is indicative of a systemic failure to take the 'hard look' required by NEPA. NEPA requires more than 'cut and paste' jobs.

Both the "Public Health & Safety" component of the AEA and NEPA require that the NRC Staff require of Applicant more than the 'minimum' necessary that Dr. Stritz testified is their policy (HT at 1608). Where license conditions may be added to do what makes sense, even though it may be slightly more rigorous than the NRC's current position of requiring the minimum conceivably necessary using theories and assumptions most favorable to Applicant in all respects.

This Atomic Safety and Licensing Board is well positioned to require of Applicant more than the least, the minimum. For example, it is well within this Board's authority to impose license conditions requiring the inclusion of Uranium as an excursion parameter for all mining units as is being done for MU #6 and MU #8. Further, it is within this Board's authority to require Applicant to test for uranium and ascertain the water levels in the 19 offsite wells. Likewise, with putting monitoring wells in the White River alluvium and allowing stratigraphic inspections of lineaments within the licensed area by Dr. LaGarry and other scientists having an academic and scientific interest in the licensed area.

Consolidated Intervenors submit that the foregoing pro-active requirements would vastly improve the effectiveness of the NRC's overall regulation of the Crawford mine in the best interests of Public Health & Safety and the environment and wildlife and public disclosure activities sought to be protected by NEPA.

Further, since the NRC Staff adeptly used the long time period of this proceeding during the past eight years as a *de facto* extension of the license to be at least 17 years - in effect granting the longest continuous operating license in the history of the NRC, or even the AEC before that, without completing an EIS. Since the NRC took so much time to 'cut and paste' its EA, and since Applicant/Licensee continues to operate on a regulatory license without any adverse business or economic impacts that have been made part of the record, it is clear that there is no prejudice for this Board to require NRC Staff to undertake amending the EA to be an EIS, publish it as a draft and allow for public comments before going final.

This will also provide the much needed time to properly address the cultural resources and consultations issues with the Intervenors Oglala Sioux Tribe (and members thereof) and other Lakota tribes. Due to the generous license by regulation, there is no reason to not take an additional two years and do a culturally appropriate and NHPA compliant TCP Survey involving tribal elders and official representatives of the Oglala Sioux Tribe as the tribe closest to the licensed area having the strongest interest in that area.

Dated this 11th day of December, 2015.

Respectfully submitted,

_____/s/_____

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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)	)	December 11, 2015

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing **THE OGLALA SIOUX TRIBE AND CONSOLIDATED INTERVENORS JOINT REPLY TO NRC STAFF AND CBR**, in the captioned proceeding were served via email on the 11th day of December 2015, which to the best of my knowledge resulted in transmittal of same to those on the EIE Service List for the captioned proceeding.

Respectfully submitted,

_____/s/_____

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