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Comment On: NRC-2011-0148-0007

Supplemental Environmental Impact Statement for the Ross In-Situ Uranium Recovery Project in Crook County, Wyoming

Document: NRC-2011-0148-DRAFT-0042

Comment on FR Doc # 2013-07332

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General Comment

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Attachments

NRDC Comments on Ross ISL Project DSEIS - 13 May 2013 FINAL

SUNSI Review Complete
Template = ADM - 013
E-RIDS= ADM -03
Add= J. Moore



May 13, 2013

Via Electronic Mail

Ms. Cindy Bladey
Chief, Rules, Announcements, and Directives Branch
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: NRDC Comments on *Draft Supplemental Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming*, Docket ID NRC-2011-0148.

Dear Ms. Bladey:

The Natural Resources Defense Council (NRDC) writes today to comment on the Nuclear Regulatory Commission's (NRC) *Environmental Impact Statement for the Ross ISR Project in Crook County, Wyoming; Supplement to the Generic Environmental Impact Statement for In-Situ Leach Uranium Milling Facilities; Draft Report for Comment* (hereinafter "Draft SEIS" or "DSEIS"). See 78 Fed. Reg. 19330 (March 29, 2013). NRDC respectfully urges NRC to withdraw the Draft SEIS as the agency's actions fail to meet the requirements of the National Environmental Policy Act (NEPA) 42 U.S.C. § 4321 *et seq.*, and further direct the applicant for this NRC's materials license to re-submit an Environmental Report that adequately addresses the scope and extent of the proposed major federal action.

Summary of Comments

The Draft SEIS is a deficient presentation that fails a federal agency's basic duties to both define the scope of a major federal action and take a "hard look" at the significant environmental impacts associated with that action. These requirements—properly defining the scope of the major federal action, and taking a searching look at the associated environmental impacts of "in-situ leach" (ISL) mining and reasonable alternatives to avoid or mitigate those impacts—comprise the heart of a federal agency's NEPA obligations.¹ Indeed, NEPA is clear in its well-established

¹ NEPA directs that DOE take a "hard look" at the environmental impacts of its proposed program and compare them to alternative means of fulfilling the same purpose and need for agency action that may avoid or mitigate environmental harms or risks posed by the Proposed Program. "What constitutes a 'hard look' cannot be outlined with rule-like precision, but it at least encompasses a thorough investigation into the environmental impacts of an agency's action and a candid acknowledgement of the risks that those impacts entail." *Nat'l Audubon Soc. V. Dept of the Navy*, 422 F.3d 174, 185 (4th Cir. 2005).

mandates. NEPA characterizes environmental impacts broadly to include not only ecological effects, such as physical, chemical, radiological and biological effects, but also aesthetic, historic, cultural, economic, and social effects. 40 CFR § 1508.8. NEPA requires an agency to consider both the direct effects caused by an action and any indirect effects which are reasonably foreseeable. Effects include direct effects caused by the action and occurring at the same time and place and indirect effects caused by the action, but later in time or farther removed in distance, but still reasonably foreseeable. 40 CFR § 1508.8.

Rather than comply with these well-established NEPA requirements, the Draft SEIS submits a set of quantitatively baseless environmental conclusions (that impacts will largely be “SMALL” and in a few specific instances “MODERATE”) concerning an arbitrarily truncated segment of a project that is quite obviously the first step in a much larger plan for mining uranium in eastern Wyoming. Our detailed comments follow a brief explanatory background that ensures a full agency record.

Background

As NRC is aware, we are currently admitted parties in this matter in an Atomic Energy Act hearing before the Atomic Safety & Licensing Board (“ASLB” or the “Board”). On October 27, 2011 and pursuant to 10 C.F.R. § 2.309 and NRC’s Federal Register notice published at 76 Fed. Reg. 41,308 (July 13, 2011), NRDC and the Powder River Basin Resources Council (PRBRC) submitted a Petition to Intervene and Request for a Hearing in the Strata licensing matter. Petitioners articulated five contentions in their Petition. These contentions address various deficiencies in Strata Energy, Inc.’s (Strata) source materials license application, for the proposed Ross In Situ Recovery (ISR) Uranium Project in Crook County, Wyoming, that have now carried over into the Staff’s DSEIS.

Following briefing on standing and the admissibility of each contention, the Board conducted a day-long hearing on these matters on December 20, 2011. On February 10, 2012, the Board issued LBP-12-3, “Memorandum and Order, Ruling on Standing and Contention Admissibility.” This 53-page opinion held that Petitioners had established standing and admitted two of their five contentions in whole while admitting the remaining three in part. *See* LBP-12-3 at 1–2, 18–25, 28, 32, 36, 37, and 39–40. On February 21, 2012, both Strata and NRC Staff filed appeals of LBP-12-3 and argued Joint Petitioners had not demonstrated standing to challenge Strata’s application for a license for an in situ uranium recovery project in Crook County, Wyoming. Strata also asked the Commission to eliminate two contentions from the proceeding, should it decline to reverse the Board’s standing determination. NRDC and PRBRC opposed both appeals. On May 11, 2012 the Commissioners issued CLI-12-12 and affirmed the Board’s standing determination and declined to consider Strata’s remaining claims. *See* CLI-12-12 at 1-2.

On March 21, 2013, Staff issued the Draft SEIS for the Ross ISR Project. Amended or new contentions on the DSEIS were due on May 6th, 2013 and today we attach those pleadings and the two supporting declarations for consideration as part of our comments on the DSEIS. The

legal pleading before the ASLB and the two supporting technical declarations from Dr. Richard Abitz and Christopher E. Paine speak for themselves, but NRC staff should be aware that the documents identify numerous NEPA deficiencies specifically related to the four admitted contentions and with respect to the new contention – NRC’s failure to consider the environmental impacts of, and appropriate alternatives to, the applicant’s actual proposed project, and instead to improperly segment the project by framing the Proposed Action under review as only a small part of the Applicant’s planned and scheduled In Situ Recovery (ISR) activities in the Lance District.

However, the previous timely filed pleadings appended as part of our comments today comments are only that – they are intended to complement and enlarge upon the deficiencies noted herein on the Draft SEIS. With the obligation to file our new and amended contentions on May 6th, we were only able to develop this larger set of comments on the DSEIS in a short timeframe, but we suggest the document is so deficient the agency should withdraw it and direct the applicant to resubmit an ER of proper scope. During that interim, we also suggest NRC invest in developing an EIS process that provides a quantitative basis for analysis, consistent with its own regulations. *See* 10 C.F.R. § 51.71(d) (The analysis for all draft environmental impact statements will, to the fullest extent practicable, quantify the various factors considered. To the extent that there are important qualitative considerations or factors that cannot be quantified, these considerations or factors will be discussed in qualitative terms.).

Specific Comments

Executive Summary

1. P. xviii, line 6. “The purpose and need for this proposed action is to provide an option that allows the Applicant to recover uranium and produce yellowcake at the Ross Project area.”

NRDC Comment:

This odd wording, evidently adopted to enable a vague scope for the project that facilitates future expansion with minimal or no further environmental analysis, potentially via FONSI’s covering future license amendments to permit additional well-fields. The Ross Project will also allow, and it is Strata’s declared intention, to recover and produce significant quantities of vanadium, but this activity is not mentioned in the statement of purpose and need.

More importantly, this statement seems an oddly vague and amorphous description for an NRC-proposed major federal action that triggers the need for this SEIS, which action is the exercise of federal authority to grant or deny a license to construct, operate, and decommission a uranium recovery facility and restore the site and mined aquifer in accordance with its statutory mandate under the AEA to ensure “adequate protection of the public health and safety” from the hazards posed by such activities, and to ensure that these activities are not inimical to the “common defense and security.” Thus one might logically expect the statement of purpose and need to say something like this:

“The purpose and need for the proposed action -- the granting of an NRC license to recover uranium from [name well-field areas] and process it at [name Central Processing Facility} for [x years] -- is to ensure, through a rigorous nuclear safety and NEPA review process prior to licensing, that the uranium recovery activities and associated environment, safety, and health risks and environmental impacts described in the license application and applicant’s Environmental Report, faithfully represent the full range of activities, risks, and impacts that will arise as a result of the licensed activity, and that all these activities will be conducted in a manner that: (1) ensures adequate protection of public health and safety and the common defense and security; (2) identifies and seeks to avoid or minimize all reasonably foreseeable environmental impacts, while mitigating any unavoidable adverse environmental impacts.

2. P. xviii, lines 20 -25. “Strata’s Proposed Action, the Ross Project, would occupy 697 ha [1,721 acres] in the north half of the approximately 90-km² [56-mi²] Lance District, where the Applicant is actively exploring for additional uranium reserves. Strata has also identified four other uranium-bearing areas that would extend the area of uranium recovery to the north with the Ross Amendment Area 1 and to the south of the Lance District with the Kendrick, Richards, and Barber satellite facilities. *These areas are not a component of the Proposed Action in this SEIS* (emphasis added).”

Lines 42 – 47: “The Proposed Action includes the option of the Applicant operating the Ross Project Facility beyond the life of the Project’s wellfields. The facility could be used to process uranium-loaded resins from satellite projects within the Lance District operated by the Applicant, or from other offsite uranium recovery projects not operated by the Applicant (i.e. “toll milling), or from offsite water-treatment operations. With that option, the life of the facility would be extended to 14 years or more.”

NRDC Comment:

This additional processing at the “Ross Project Facility” is described as an “option” within the scope of the Proposed Action, but analysis of the environmental impacts of the additional wellfields and facilities needed to produce feedstock for this processing are not “a component of the Proposed Action in this SEIS.” Later in the document we learn that the presently proposed Central Processing Plant (CPP) facility is being sized to accommodate the additional processing expected from “other offsite uranium recovery projects” or “offsite water-treatment operations.” Note also that the term of this additional processing, and any connected environmental impacts associated with producing the uranium-loaded resins that are expected to be shipped to this enlarged facility, is given as “14 years *or more*,” and thus is essentially open-ended with respect to the connected environmental impacts of the additional well-field operations that produce these uranium-loaded resins.

However, meaningful consideration of impacts in the SEIS is limited to the Ross Project well-fields only, even though the capacity of the proposed CPP has been sized to accommodate a throughput four times greater than that required by the Ross Project alone, and will thus enable the simultaneous ISL mining of additional areas. If the ISL

mining were to occur sequentially over many years, as “reasonably foreseeable” future mining areas are developed in series, there would be no need to build the facility with four times the capacity need for the Ross Project alone.

This already planned mining, coincident with the Ross Project, is a clear and obvious consequence of the NRC’s proposed licensing action that must be analyzed in detail in an original ER and in a Draft SEIS. In reality, the Proposed Action effectively encompasses this additional ISR activity, which vastly exceeds the scope of the “Ross Project” itself, because it is planned to be carried out through the establishment of multiple “satellite” ISR operations via multiple Ross Project license amendment amendments that would most likely invoke “No Significant Hazards Consideration,” and thus potentially be granted without a contested hearing opportunity, and be supported by multiple NEPA “Findings of No Significant Impact” (FONSI) for each additional satellite operation. See also, Paine Declaration, filed May 6 in this proceeding.

Further, the Paine declaration substantiates our claim that both the near-term and ultimate size and geographic extent of the uranium mineralization that Peninsula is intent on recovering from the Lance District deposits are much larger than what is analyzed in the DSEIS, and thus the scale of environmental impacts will be proportionately larger, nearer in time than hitherto described, longer lasting, and potentially more damaging to the environment than assessed in the DSEIS.

3, P. xix. “The ore zone is that portion of the aquifer that has been permanently exempted by the U.S. Environmental Protection Agency (EPA) from requirements as an underground source of drinking water under the Safe Drinking Water Act.”

NRDC Comment:

The geographic extent and boundaries of the “ore zone” that has been “permanently exempted” and subject to water quality degradation is not given with any precision in the SEIS. We understand separately from EPA that the current extent of the application for permanent exemption extends only to the smaller Ross Project. Are there separate filings NRC is aware of where the SDWA exemption proposed or granted for the aquifer to be mined by the Ross Project already cover some or all of the additional “satellite areas?” What is the basis for the applicant’s confidence to build a CPP facility that is four times the size of that needed for the Ross Project and twice the size of the facility analyzed in the GEIS?

4, P. xix. “Once uranium recovery is complete, the ore-zone’s ground water is restored to NRC-approved ground-water protection standards, which are protective of the surrounding ground waters.”

NRDC Comment:

Neither the specific restoration standards that will be applied to the ore zone’s ground water, nor any analysis demonstrating that such “restoration” will be “protective of the surrounding ground waters,” is provided in this DSEIS. On the contrary, the penetration

of the mined and surrounding aquifers in the Ross Project Area by some “3000 drill-holes and wells” at an average density of “1.7 wells per acre” [p. xxvi] suggests the potential for substantial fluid migration and degradation of water quality beyond the ore zone.

5. P. xx. “The significance of potential environmental impacts is categorized as follows: “Small: ...Moderate:...Large:....”

NRDC Comment:

While the NRC’s taxonomy (small, moderate, or large impacts) for classifying and characterizing environment impacts has been established for some time, the way it has evolved in its use is inadequate and the DSEIS illustrates these problems. Specifically, such terms are no longer tied to any consistent set of quantitative or otherwise objectively ascertainable metrics for assessing and comparing the impacts of ISL activities on groundwater or any other environmental resource, or on human health.

For example, what is the difference, in terms of measurable impacts on human health and the environment, between “altering noticeably” and “destabilizing important attributes of” the resource considered? If construction and operation of one ISL-related activity (one well-field “module,” for example) is assessed as having a “small” environmental impact on “land use” and “geology and soils” because it represents only a small fraction of “disturbed” land within a given area, does it necessarily follow that 5000 such wells, and the piping and roads that connect them, will likewise have only a “small” impact? If the impacts of one well field penetrating a “shallow aquifer” are assessed as “small,” does that mean that the impacts of scores of such well fields penetrating the same aquifer are also “small”? If all the impacts to each of the affected resources (Land, soils, groundwater, ecology, air quality, noise, etc. are assessed individually as being “small,” does it follow that the aggregate and cumulative impact of all these “small” changes on a given area is likewise “small?” The NRC’s methodology leads ineluctably to such “conclusions” based on no quantitative data.

6. P. xxiv, line 5. “Construction: Impacts would be SMALL. A total of 113 ha [280 acres] of land, which represents 16 percent of the Ross Project Area, would be disturbed during the construction of a CPP, surface impoundments, and other auxiliary structures such as storage areas and parking lots. The well-fields would be sequentially developed over the Ross Project lifecycle. All disturbed areas would be fenced, and thus, somewhat limit grazing by livestock, access by wildlife, and recreational opportunities. Operation: Impacts would be SMALL....Areas where Ross project uranium production activities would take place would remain fenced, somewhat limiting grazing and crop production.”

NRDC Comment:

The total land area, including wellfields, which would remain fenced and limit access by wildlife, and its percentage of the total project area, are not given. Thus there is no basis for the conclusion that the impact on wildlife, crop production, and livestock grazing would be “Small.”

7. P. xxiv, line 19: “No new facilities would be constructed that would result in additional land disturbance during operation, although well drilling would continue as the wellfields would be sequentially developed.”

NRDC Comment:

This is a misleading statement. Figure 2.6 on page 2-8 shows “facility construction” occurring during “facility operation,” but more to the point, continuing well-field development involves continuing construction of “module buildings” and “valve manholes” and continuing trench excavation for burying the extensive pipeline network that carries lixiviant to potentially thousands of injection well and retrieves it from thousands of recovery wells. Also, up to five deep disposal wells are permitted over the life of the project. Each one of these is an industrial installation mounted on a 250 x 250 ft. asphalt or gravel pad with storage tanks, pumps, filtration systems, I & C systems, and injection equipment for process chemicals. In other words, construction activity will be almost continuous throughout the first eight years of the project, according to Figure 2.6-16.

8. P. xxvii, line 40: “Operation: The impact [on groundwater] would range from SMALL to MODERATE (depending upon whether excursions occur).”

NRDC Comment:

No empirical evidence or reference is provided for this conclusion, and thus the statement is meaningless. If a major excursion occurs and remains undetected for an extended period, for example, why would the impact not be “LARGE?” Again, this NRC methodology for assessing and comparing impacts has evolved to a degree where it is baseless.

9. P. xxvii, line 49: “The Applicant’s implementation of BMPs during Ross Project operation would reduce the likelihood and magnitude of spills or leaks [getting into shallow aquifers] and facilitate expeditious cleanup.”

NRDC Comment:

The SEIS is examining only the best case. What if the price of uranium drops and the Applicant does not follow “Best Management Practices” in order to save money and maintain profit margins? What if the operation leaks like a sieve and plant personnel cover up the leaks, or never bother to investigate them? What damage could be done then to shallow aquifers?

10. p. 1-9, line 25:

NRDC Comment:

Please provide in these SEIS the USFWS recommendations “for protective measures for threatened and endangered species” and “recommendations concerning migratory birds.” Which of these measures and recommendations will be incorporated as binding conditions of the proposed license?

11. p. 1-9, line 35: “Impact mitigation measures were discussed” [with Wyoming Game and Fish Department (WGFD)] regarding “invasive species and impacts to wildlife due to power lines, evaporation ponds, and increased traffic.”

NRDC Comment:

Please provide in the SEIS a discussion of what specific mitigation measures were recommended by WGFD staff to protect big game animals, raptors, migratory birds, and small mammals, and which of these measures have been incorporated as binding conditions of the proposed Ross Project license?

12. p. 2-13, line 50: “[the CPP]...would be designed to process approximately 1.4 million kg/yr. (3 million lb./yr. of yellowcake (Strata, 2011b), which is about four times the capacity necessary to recovery (sic) uranium from the Ross Project. The excess capacity in the yellowcake production circuit would allow processing of loaded IX resins brought to the Ross Project from other ISR or water treatment facilities.”

NRDC Comment:

This statement provides incomplete and misleading information. The loaded resins “brought to the Ross Project” would be brought there, in the first instance, by Strata Energy Inc., itself, from its own satellite operations, and not from “other ISR or water treatment facilities.” Moreover, the excess capacity is likely to be applied first to additional uranium bearing lixiviant arriving by pipeline at the CPP from contiguous Strata well-field operations. NRC Staff should provide straightforward clarity with respect to Strata’s near term expansion plans.

13. p. 2-16, line 9: “The Applicant notes that the final areal extent of the constructed wellfields is expected to be greater as additional ore-zone delineation occurs (Strata, 2011b).”

NRDC Comment:

How much greater? And please provide specifics. This is not a minor matter, as it would increase environmental impacts for almost every project phase and affected resource.

14. p. 2-21, line 33: “In the event that recovery, injection, and/or monitoring wells must be located within a floodplain....”?

NRDC Comment:

How many, and what percentage of the total wells are planned and/or likely to be located “within a floodplain?”

15. p. 2-21, line 45: “The Applicant expects that the water produced during well development would meet Wyoming’s temporary Wyoming Pollution Discharge Elimination System (WYPDES) discharge standards, which would allow this water to be discharged directly to the ground surface (WDEQ/WQD, 2007).”

NRDC Comment:

(a) Please provide the empirical basis for the Applicant’s “expectation,” and do the NRC and EPA agree with it? (b) Are WYPDES discharge standards sufficiently protective that the produced water will not cause any harm to wildlife, surface water quality, or shallow aquifers if discharged directly to the ground surface?

(c) What is the NRC’s licensing requirement in the event that the water produced during well development does not meet WYPDES discharge standards? (d) Please describe any contingency plans and capabilities required under the proposed license for safely disposing of the produced water from well development if the Applicant’s “expectation” proves to be incorrect.

16. p. 2-22, line 8: “After initial testing by the Applicant, the well would be retested at five year intervals.”

NRDC Comment:

What reassurance is to be derived from the 5-year retesting interval, given that the operating life of the average ISL injection or recovery well is considerably less than five years? Please provide data on how many wells, as a percentage of the total licensed and operated for ISL injection or recovery in the NSDWUMR region, or in Wyoming, have been retested for well casing integrity prior to well plugging and abandonment.

17. p. 2-23, line 14: “The applicant would test for leaks with fresh water on the pipelines prior to their burials, in order to ensure the pipelines’ mechanical integrity.”

NRDC Comment:

(a) Please describe the specific standards, approved test protocols, and inspections that the NRC (a) generally requires and (b) specifically intends to apply to the “Ross Project,” and to further already planned “Lance District Development” that will be undertaken pursuant to the License for the “Ross Project,” to ensure the mechanical integrity of buried ISL pipelines;

(b) What kind of leak detection/warning systems will the NRC require to ensure that the Applicant reacts promptly to any leaks?

(c) How will the NRC Staff verify the licensee's compliance with buried pipeline integrity requirements?

18. p. 2-24, line 14: "Prior to the submittal by an Applicant of its license application to the NRC, an Applicant performs site-characterization environmental monitoring efforts for at least a year...the values measured by Strata prior to its submitting its license application are called 'pre-licensing baseline values' in this SEIS."

NRDC Comment:

(a) Please provide in the SEIS a map showing the name, location and targeted aquifers of all pre-existing wells and purpose-drilled monitoring wells that contributed pre-licensing baseline ground-water-quality data to the Applicant's site characterization of the Ross Project area.

(b) Please describe the specific regulatory function of these "pre-licensing baseline" measurements of water quality in NRC's regulatory scheme to guard against aquifer degradation.

(c) Are they the standard by which lixiviant "excursions" outside the ore zone and/or aquifer restoration to pre-mining conditions are to be judged under the Proposed License? If not, why not?

19. p. 2-24, line 14: "Prior to commencing ISR operations, these [monitoring] wells [around the perimeter of each wellfield] would allow sampling and analysis of ground water and, in this SEIS, this type of monitoring is called 'post-licensing, pre-operational.' The resulting...data would be used to determine concentration-based levels that would permit identification of any excursions from the respective wellfields; these would be called the Ross Project's upper control limits (UCLs). These post-licensing, pre-operational baseline values would be established for each separate wellfield (and they would be codified in the Applicant's license)" [emphasis added].

NRDC Comment:

From the description in the SEIS, it is apparent that monitoring to set these UCLs would be undertaken only when a given wellfield's construction is complete and a perimeter ring of monitoring wells has been established around the wellfield. This methodology raises a number of important issues that are not discussed in the SEIS.

(a) What is the scientific and technical rationale for using "post-licensing, pre-operational," rather than "pre-licensing baseline" measurements, to establish baseline water quality data to detect excursions?

(b) Since the construction of multiple individual wellfields is a sequential operation taking place over several years, how will NRC and the applicant avoid the obvious potential problem of each operational wellfield degrading the "post-licensing, pre-operational" baseline water quality of subsequent down gradient monitoring wells targeting the same aquifers, creating a potentially cascading deterioration of baseline water quality standards from wellfield to wellfield in the course of building-out the "Ross Project" and already scheduled "Lance District Development?"

(c) For any given wellfield, how will NRC/Applicant prevent the “post-licensing, pre-operational baseline” water quality measurements from being contaminated by the effects of drilling, casing and testing the injection and recovery wells, and from the effects of previous and ongoing exploratory drilling?

20. p. 2-24, line 41: “Later, prior to actual uranium-recovery wellfield operation, but after the initial NRC license is issued for wellfield construction, the ground water in each wellfield would be analyzed for the post-licensing, pre-operational baseline concentrations of constituents specified by the NRC (NRC, 2003a).”

NRDC Comment:

Comment 20 and its many parts, directed at the above sentence in particular, focuses on establishing baseline water quality prior to licensing and as an important component of NEPA review.

(a) Are the “post-licensing, pre-operational baseline concentrations of constituents” referenced in the above excerpt from the SEIS the same as the “Ross Project’s upper control limits (UCLs)” described in the preceding paragraph? If not, why and how would they differ?

(b) When and how would the NRC employ these “post-licensing pre-operational baseline concentrations” to measure and mitigate adverse impacts on groundwater from (1) “the Ross Project;” (b) the “Lance District Development” shown in Figure 2.6.

(c) Please provide a map showing the sequence, timing and locations of the “pre-operational baseline” measurements for each well field proposed or planned for development under (1) the Ross Project; (2) the “Lance District Development” shown in Figure 2.6

(d) The baseline concentration of monitored constituents in Ross Project aquifers of interest as given in Table 3.7 on page 3-41 is frequently given as a range, rather than a single value:

(1) Please describe in detail the scientifically valid techniques the NRC will employ to translate such range bound data into a single value for the purpose of establishing UCL’s and “pre-operational baseline concentrations of constituents” in the Proposed License for groundwater monitoring purposes.

(2) When and how will the NRC select the constituents to monitor for (i) “the Ross Project, and (ii) “Lance District Development.”

(3) When in the ISL uranium recovery licensing process, and how will NRC employ the values that are established for each constituent, to control excursions and establish target restoration values for aquifer restoration?

(4) For the purpose of ensuring that this SEIS complies with NEPA, how does the NRC evaluate and compare the environmentally protective efficacy of prospective UCLs and “post-licensing pre-operational baseline concentrations” that it has not yet established?

(i) If these UCLs and post-licensing baseline concentrations are to be established “prior to commencing ISR operations....for each separate wellfield” as described on page 2-24, and there are “15-25 wellfield areas” in the “Ross Project” alone, as described on page xix, how can all these

multiple well-field limits simultaneously be “codified in the *Applicant’s* NRC license,” when the “Applicant” must logically become the “Licensee” upon commencing operation of the first well-field?

(ii) Legally speaking, is a “Licensee” at one and the same time also a perpetual “Applicant” when it comes to the licensing of subsequent well-fields? If so, please cite one or more specific instances in which the NRC has revoked or suspended an initial ISR materials license for a Licensee’s failure to agree to environmentally protective UCLs and TRVs for subsequent wellfields developed under the license that was granted for operation of the first well-field?

(e) Please state the case why the public should repose any confidence whatsoever in the environmental protection afforded by this “bass-ackwards” regulatory scheme?

(f) The ER (p. 6-11) contains a reference to “Target Restoration Values (TRVs),” a term that does not appear to be used in the SEIS. The Draft SEIS does not include this acronym in its “List of Abbreviations” on p. xxxix. Please provide an adequate response in the Final SEIS to the following requests for relevant environmental information:

- (1) What is the definition of a “TRV,” exactly how does it relate to the term “post-licensing pre-operational baseline concentration” used in the Draft SEIS, and why was use of the term “TRV” not employed in the draft SEIS?;
- (2) Who within NRC establishes a TRV?
- (3) What, if any, peer-reviewed and widely accepted scientific and technical methodologies are used to establish it?
- (4) Can TRV’s for different constituents be established at different times, or are they all determined at the same time?
- (5) Please describe in detail the process that ensues when Licensee does not achieve the “Target Restoration Values” specified for each wellfield in its license.
- (6) Please provide a schedule showing when during the licensing process for the “Ross Project” and subsequent planned “Lance District Development” TRVs were/will be established, and how does the timing and technical methods of this procedure compare to those used in previously -licensed ISL operations;
- (7) Was a comparative analysis of the technical feasibility and environmental benefits and costs of setting and achieving various alternative TRVs for the “Ross Project” performed in connection with this Draft SEIS?
- (8) Is an analysis like the one described in (vii) above germane to NRC’s NEPA evaluation of the comparative environmental impacts involved in granting, denying, or modifying the terms of the proposed license for the “Ross Project?” If not, why not? Please provide detailed information in the Final SEIS documenting any methodologies used and results obtained in such an analysis.
- (9) Please explain how the “post-licensing” determination of “upper control limits”(UCL’s) and Target Restoration Vales (TRVs) for the “Ross Project” and “Lance District Development” would inform the NRC’s required pre-licensing NEPA analysis of reasonable alternatives, including mitigation alternatives for limiting unavoidable adverse impacts, that by law must precede and inform an NRC materials licensing decision?

(10) (i) Is a “wellfield” the same as a “wellfield area”? If not, what is the distinction? How does the term “wellfield module” relate to the aforementioned terms?

(ii) How many distinct “well-field modules,” “well-fields,” and “wellfield areas” are contained in Figure 2.4 (“Proposed Ross Project Facility and Wellfields”) on page 2-6 of the SEIS?

(iii) Are the shaded areas marked “Wellfield Perimeter Accounting for Future Drilling” in Figure 2.4 included in the SEIS detailed analysis of environmental impacts from the proposed “Ross Project”? If not, why not?

(iv) Are the shaded areas described in the preceding paragraph included in the analysis of “cumulative impacts” from reasonably foreseeable drilling activity ostensibly contained in Section 5 of the Draft SEIS? If so, please provide the page and line number reference.

(g) Please explain why it is (1) scientifically indicated for “baseline” pre-mining water-quality monitoring purposes, and (2) advantageous for a NEPA-informed licensing decision, for the NRC to establish UCL’s after well-field licensing and construction, rather than before, given the availability of both existing “pre-licensing baseline” measurements, and the obvious ability to establish additional environmental sampling wells over relevant portions of the site prior to the construction of the first complete well field.

21. p. 2-25, line 31:

NRDC Comment:

Figure 2.4 on page 2-6 of the SEIS shows the location of 5 “proposed deep disposal wells” within the “Ross Project Area” alone.

(a) Please provide a map(s) showing the number, locations and required capacities of all Class 1 deep disposal wells and target aquifer(s) associated with disposal of wastes from the scheduled “Lance District Development” shown in Figure 2.6, including any currently planned and reasonably foreseeable ISR operations in the Lance District that are not reflected in Figure 2.6. (Please consult the attached “Declaration of Christopher E. Paine” for the names and approximate locations of future Lance District ISL projects planned by the Applicant, according to its Australian parent company, Peninsula Energy, Ltd.)

(b) Please provide a map(s) showing the number, proposed locations and required capacities of all Class 1 deep disposal wells and target aquifers that would dispose of wastes from full utilization of the currently proposed CPP capacity (4x greater than required by the “Ross Project” alone) over its “reasonably foreseeable” full operating lifetime.

(c) Please provide a scientifically and technically adequate discussion of the cumulative environmental impacts of such a vastly increased volume of uranium mining waste disposed via deep well injection, including a cumulative impact assessment that includes the adverse impacts of other deep well injection activities in the same NEPA region of interest.

- (d) Please provide all the information related to Applicant's UIC Permit No. 10-263, dated April 4, 2011, that was requested in the EPA's Region 8 Scoping Comments letter to the Commission of 12/29/2011, including:
- (i) Discharge zones, well locations, groundwater classifications;
 - (ii) Monitoring requirements, plugging and abandonment procedures;
 - (iii) The permitted injection formation, and descriptions of any underground sources of drinking water (USDWs) that may occur above or below the permitted injections zones;
 - (iv) Relevant information on existing aquifer exemptions in the vicinity that have been approved by the permitting agency;
- (e) A full and adequate discussion of the process by which UIC permits are issued and the environmental and safety factors are considered in their approval;
- (f) A full and adequate discussion of design features and/or mitigation measures required under the permit to prevent potential adverse impacts to groundwater resources from deep disposal well operations.

22. p. 2-25, line 31:

NRDC Comment:

Figure 2.4 on page 2-6 of the SEIS shows the location of a large number of overlapping "wellfield perimeters" representing potentially thousands of UIC Class 3 Mining Wells within the "Ross Project Area" alone.

(a) Please provide tables and map(s) showing the number and locations of all prospective UIC Class 3 mining wells (or "wellfield modules" and/or "well-fields" if specific well locations are not yet known) and the targeted aquifer(s) that would be part of the impending "Lance District Development" shown in Figure 2.6, and classify them as one of the following:

(1) Part of the Applicant's current schedule and business plan for near-term development (defined as initiation of well-field construction within 10 years of "Ross Project" licensing) of proven and/or indicated uranium resource areas within the Lance District utilizing the processing capacity of the "Ross Project" CPP;

(2) Targeted for future development based on the Applicant's currently inferred uranium resource estimates in the Lance District and utilization/expansion of the planned processing capacity of the Ross Project CPP;

(3) Any other reasonably foreseeable ISR projects in the Lance District.

(b) Please provide a map(s) showing the additional number and proposed locations of all UIC Class 1 Mining Wells (or "wellfield modules" and/or "wellfields") and target aquifers that could potentially be drilled premised on the availability of the proposed Ross project CPP capacity (4 x greater than required by the "Ross Project" alone) over its "reasonably foreseeable" full operating lifetime.

(c) Please provide a scientifically and technically adequate discussion of the cumulative full life cycle environmental impacts that this number of UIC Mining Wells for uranium extraction could have on the NEPA-defined region of interest surrounding the Ross Project, including the adverse impacts of all other reasonably foreseeable UIC Class III

Mining Wells and UIC Class I Disposal Well activities in the same NEPA region of interest.

23. Page 2-26, line 14: “The Applicant proposes that each [disposal well] location would consist of a 76 m x 76 m [250 ft. x 250 ft.] pad [asphalt or gravel] with a storage tank (Strata 2011b; Strata 2012b). Surface equipment for the deep-disposal wells would include storage tanks, pumps, filtration systems, instrumentation and control systems, and equipment for injection of process chemicals (Strata, 2011b).

NRDC Comment:

A gravel or asphalt pad measuring 250 ft. x 250 ft. is equivalent to an area of 1.43 acres, and the UIC permit for the Ross Project reportedly allows for five such deep-well waste injection sites. So, more than 7 acres (not including associated service roads and pipelines) of the Ross Project area could be industrialized via the construction and operation of such deep disposal sites.

(a) Are the land use-impacts of these, and any planned and reasonably foreseeable disposal wells required for the “Ross Project” and “Lance District Development,” included in the SEIS estimate of land area disturbed by ISR mining? Please provide the page and line numbers where these impacts are included.

(b) How and when will the concrete or gravel pads surrounding the deep disposal wells be reclaimed?

(c) What is the licensed disposal capacity of liquid wastes for each UIC-permitted well, and what is the total licensed disposal capacity of the five permitted wells mentioned in the SEIS for the “Ross Project?”

(d) If five such deep-disposal sites have been permitted for waste disposal from operation of the CPP in connection with the Ross Project, how many additional deep disposal wells, with what disposal capacities, targeting which formations, are required in connection with processing of pregnant lixiviant and/or loaded resins from the following planned “satellite projects” that would utilize the CPP: Ross “Amendment Area 1;” Kendrick Satellite Area; Richards Satellite Area; Barber Satellite Area.

(e) Please provide a table showing the above information, and when construction, operation, and abandonment of each disposal well is planned, or could reasonably be expected to occur.

(f) Please provide a map showing the planned or reasonably foreseeable locations of the disposal wells described in (d) and (e) above.

(g) How many additional deep-disposal wells, targeting which formations, at which locations, would be required to dispose of the wastes from processing loaded resins from the following potential ISR facilities within 50 miles of the Ross Project’s CPP: Aladdin ISR Project, 41 miles from the CPP, under consideration by Powertech; Elkhorn ISR Project, 16 miles from the CPP, under evaluation by NCA Nuclear, a wholly owned subsidiary of Bayswater Uranium Corp; Hauber ISR Project, 14 miles from the Ross project, also owned by NCA Nuclear, in a joint venture with Ur-Energy Inc; Alzada Project, 39 miles from the Ross Project, also owned and operated by NCA Nuclear?

24. Page 2-26, line 39: “As shown by the proposed schedule in Figure 2.6, uranium recovery during the proposed Ross Project would follow a ‘phased,’ where one group of well modules could be in operation, while preceding well modules are being engaged in aquifer restoration (Strata, 2011b). During the operation phase, three major phases would occur involving the wellfields: an operation-only phase, a concurrent operation- and aquifer-restoration phase, and an aquifer-restoration-only phase.”

NRDC Comment:

(a) The referenced Figure 2.6 contains no reference to a proposed “Ross Project,” but rather its title states that it describes a “Schedule for Potential Lance District Development.”

(1) Please explain this discrepancy.

(2) Is the current title for Figure 2.6 in error, or is it the figure itself that is erroneous?

(b) Figure 2.6 shows an “aquifer-restoration only phase” being attained about 11.75 years after regulatory approval.

(1) If the figure actually refers to the “Ross Project,” as mistakenly claimed above, is this a correct estimate for the “Ross Project?”

(2) If the figure refers to “Lance District Development,” as currently stated, is 11.75 years a correct estimate for the currently planned and reasonably foreseeable “Lance District Development”?

(3) (i) What fraction of the Applicant’s “reasonably foreseeable” mining activities in Wyoming involve development of the “Lance District,” and

(ii) What fraction of these Lance District activities are already planned and included in the business plan of the Applicant for this area?

(4) Would construction of the CPP be economically viable if its feedstock were limited to the “Ross Project” as currently defined in the SEIS? If not, why is the scope of the “Proposed Action” in this SEIS limited to the “Ross Project”?

(5) What fraction of the potential production areas that the Licensee has identified in the “Lance District” must be developed to ensure economic viability of the Licensee’s investment in the CPP, and hence a financial capacity to comply with all environmental mitigation, monitoring, and restoration undertakings undertaken in connection with the “Ross Project” license?

(c) Why did the NRC limit the scope of its detailed environmental analysis in the SEIS to the “Ross Project,” when the proposed licensed capacity for the CPP is clearly designed to process uranium recovered from a much wider area than the Ross Project?

(1) Please provide the most recently updated schedule(s) for “Lance District Development” planned by this or any other Applicant for an NRC license.

(2) Please provide a detailed map showing the cumulative extent of the planned and contemplated “well-field areas” to be mined and enclosed by fences in the course of “Lance District Development” that would utilize the proposed CPP to be licensed pursuant to the “Ross Project.”

(3) Which specific geographic areas will be mined when, and to what extent does this schedule overlap that of the “Ross Project”?

25. Page 2-27, line 22: "...Table 2.4.1 of the GEIS shows consistency between the Ross project and the GEIS, except for higher concentrations of uranium and vanadium that could be present in the pregnant lixiviant at the Ross Project (Strata 2011b); NRC, 2009)."

NRDC Comment:

- (a) What accounts for these "higher concentrations of uranium and vanadium" (than were analyzed in the GEIS), and what are they?
- (b) Are they a function of the particular ISR process to be employed, or are they also present in the ore body to be mined pursuant to (1) the "Ross Project;" (2) "Lance District Development"?
- (c) Please provide an adequate NEPA discussion of the adverse environmental impact these "higher concentrations" could have on (1) post-mining concentrations of key constituents of groundwater quality in the mined aquifer? (2) Radiation exposure to site workers; (3) waste disposal.

26. Page 2-27, line 30: "The excess water, referred to as 'production bleed,' is a radioactive byproduct material that must be properly managed and disposed (NRC 2009). For the Ross Project, the Applicant proposes production-bleed range from 0.5 percent to 2 percent, and averaging 1.25 percent of the injection volume (Strata, 2011b).

NRDC Comment:

Please provide a NEPA-compliant quantification and sensitivity analysis of environmental consequences in the event that:

- (a) The required bleed range to prevent excursions exceeds that "proposed" by the Applicant by technically plausible margins; and/or
- (b) The average bleed rate exceeds 1.25 percent of the injection volume;
- (c) What is the maximum observed peak bleed rate and maximum bleed volume for an ISR well-field to date in the Nebraska-South Dakota-Wyoming Uranium Milling Region?
- (d) What is the maximum observed average bleed rate and total bleed volume for an ISR wellfield in this region?
- (e) Please provide the proposed and/or estimated total "injection volume" for the Ross Project, and the technically supported range of uncertainty that surrounds this number?
- (f) What is the proposed or estimated total "injection volume" for the full "Lance District Development" "referenced in Figure 2.6, and a technically-supported range of uncertainty that surrounds this number?
- (g) What is the relationship between, on the one hand, expected versus actual well-field bleed rates, and:
 - (1) The maximum safe capacity of the RO circuit in the CPP;
 - (2) Higher than expected excess permeate and the capacity of planned surface impoundments;
 - (3) Higher than expected brine production and the capacity of planned storage impoundments prior to deep well injection;
 - (4) The licensed capacities of deep injection wells.

(h) (1) At what bleed rates and injection volumes would the inbound capacity of the CPP-RO circuit be exceeded, and where would this excess bleed be stored until it could be processed in the CPP?

(2) What types of temporary waste storage capacity, if any, are contemplated to deal with higher-than-expected “bleed” production?

27. Page 2-27, line 43: (a) “The Applicant proposes a maximum injection pressure ... less than the pressure rating for operation of the pipes and other equipment (Strata, 2011b).”

NRDC Comment:

(a) What is the pressure rating for operations of the pipes and other equipment to be used in the injection and recovery circuits of the “Ross Project” and the scheduled “Lance District Development” described in Figure 2.6.

(b) “...pressure requirements within a specific wellfield generally tend to increase with time.” Please provide a discussion of wellfield injection pressure requirements over time, including the range of expected and maximum plausible values for minimum, maximum, and average wellfield injection pressure over the life of the wellfield.

(c) What is the relationship, if any, between injection pressure, wellfield pressure, wellfield balance, and the likelihood of excursions?

(d) Does the likelihood of excursions increase with increasing with increasing injection pressure?

(e) Does the available regulatory record of ISR excursions show any correlation between injection pressure and the likelihood of excursions?

28. Page 2-27, line 48. “The Applicant suggests that, in order to maintain flow rates and wellfield balance, some wellfields would require flexibility in their allowable injection pressure.”

NRDC Comment:

(a) What does the phrase “flexibility in their allowable injection pressure” mean in practice?

(b) How would this “flexibility” be administered?

(c) Would this flexibility encompass exceeding the Applicant’s proposed “maximum injection pressure” of 140 pounds-per-sq.-in.?

(d) If so, by how much, and for how long?

(e) What specific purpose is served by allowing this “flexibility” under the License?

(f) Does operating at such elevated injection pressures increase the likelihood and/or potential severity of leaks?

29. Page 2-28, line 1: “To specifically avoid the injection restriction problems that plagued the Nubeth operation, the Applicant has proposed several improvements to well-design, well development, and filtration (Strata 2011a; Strata, 2011b).”

NRDC Comment:

(a) Please describe the “injection restriction” problems that plagued the Nubeth operation.

- (b) Please describe the specific primary purpose and function of each improvement to well-design, well-development, and filtration proposed by the Applicant.
- (c) Which improvements are directed primarily or exclusively at increasing production efficiency, and which are directed primarily or exclusively to improving safety and reducing the risk of environmental contamination?
- (d) For the purposes of preparing this SEIS, which improvements, if any, did NRC assume as being accepted and incorporated in the license?
- (e) How do these “improvements,” taken individually and together, affect the risk of environmental contamination from the “Ross Project” and scheduled “Lance District Development?”

30. Page 2-28, line 40: “The monitoring of water levels that would be performed would serve to avert a potential excursion.”

NRDC Comment:

Please explain further:

- (a) Which specific “water levels” would be monitored, how would they be monitored, where would they be monitored, in order to “avert” a “potential” excursion?
- (b) How does NRC infer scientifically from “water levels” alone that an excursion is about to occur, as opposed to detecting one already in progress?
- (c) What has been the record in ISR operations of using such water level measurements to “avert” (i.e. prevent) excursions from occurring.
- (d) How many of the excursions that were later confirmed to have occurred via exceeding UCLs, were correctly forecast by such water level measurements, and why did such water level measurements fail to avert them?

31. Page 2-28, line 41: “Water quality indicators in the ground water from monitoring wells that would be established after wellfield installation (i.e. post-licensing, pre-operational baseline concentrations defined as excursion indicators) would also be used to detect whether an excursion has occurred.”

NRDC Comment:

Please clarify the meaning of this inherently ambiguous sentence.

- (a) Is it the “water quality indicators,” or the “monitoring wells,” or both that would be “established after wellfield installation?” Are not “monitoring wells” an inherent part of “wellfield installation? Why would they be established “after wellfield installation?”
- (b) If the water quality indicators are in fact established after wellfield installation but prior to “operation,” what prevents the prior drilling, construction, and pressure testing of hundreds or potentially thousands of previously constructed injection and recovery wells from polluting the baseline measurement of the “water-quality indicators” to be used as “excursion indicators?”
- (c) If these “water-quality indicators” are “also used to detect” whether an excursion has occurred, what is the other method implied by the use of the word “also” in this context, given that “water level measurements” have been previously described as “averting a potential excursion,” as opposed to “detecting” one that has already occurred?

32. Page 2-30, line 10: “If a vertical excursion occurs, then the Applicant’s injection of lixiviant would cease, and for any excursion, corrective action would be initiated.”

NRDC Comment:

Why would NRC Ross Project license conditions require cessation of lixiviant injection only in the case of a “vertical excursion,” rather than all excursions?

33. Page 2-30, line 20: “If an excursion cannot be recovered within 60 days of confirmation (measured by a concentration of more than 20 percent of any excursion indicator)....”

NRDC Comment:

- (a) Is “confirmation” of an excursion the same as initially “detecting” it?
- (b) What constitutes “confirmation” of an excursion for the purpose of triggering the Licensee’s 24 hour notice requirement to the NRC?
- (c) How soon after “confirmation” of a vertical excursion would lixiviant injection be required to cease?
- (d) How soon following the 60 day period for “retrieving” horizontal excursions does the Licensee have to decide whether to “terminate lixiviant injection within the wellfield” or “increase the surety for the ISR project by an amount sufficient to cover the full-third party cost of correcting and remediating the excursion?”

NRDC Comment 33a:

Figure 2.4 shows many contiguous and overlapping “Ross Project” wellfields that appear to share common boundaries at the ground surface.

- (a) If a horizontal “excursion” occurs into a neighboring well-field that is under construction or into an area designated for future uranium well-field development, does this count as an “excursion”?
- (b) Can a hydrologic “cone of depression” to prevent excursions encompass multiple contiguous wellfields, so that horizontal excursions are deemed to occur only along a more restricted azimuth along the conjoined external boundaries of the contiguous wellfields, as shown in Figure 2-6?

34. Page 2-31, line 26: “The off gases generated during the drying cycle would be filtered and scrubbed to remove entrained particulates.”

NRDC Comment:

Are these off-gases then released to the open air through a stack? What are the radioactive and/or other potentially hazardous constituents of these off-gases, if any, and would prolonged exposure to them over the lifetime of the CPP pose an incremental health risk to plant workers or nearby residents?

35. Page 2-32, line 5: “The Applicant estimates that 0.1 – 2 kg of V₂O₅ would be produced for every 1 kg. of U₃O₈.”

NRDC Comment:

What accounts for the extreme variability in the estimated yield of co-produced vanadium?

36. Page 2-32, line 18: “The purpose of aquifer restoration is to restore the respective aquifer to its baseline conditions, as defined by post-licensing, pre-operational constituent concentrations...so as to ensure public health and safety.”

NRDC Comment:

Please point to the specific pages and lines of the Draft SEIS – because we have been unable to locate them – wherein it is demonstrated (or in the alternative provide in the FSEIS an adequate NEPA-complaint analysis showing) that—

(a) Yet-to-be-defined “post-licensing, pre-operational constituent concentrations” in groundwater will fairly represent the baseline water quality of the target aquifer before wellfield development activities commence under the “Ross Project” and scheduled “Lance District Development;”

(b) Irrespective of any avowed “purpose” of “aquifer restoration,” it would actually restore the small segment of the mined aquifer within each wellfield to the NRC’s *ex-post facto* determination of “baseline conditions,” much less any scientifically credible representation of pre-ISR water quality;

(c) The *integrated* summation of all these hundreds of individually variable wellfield target restoration values, even if achieved in practice, would actually restore the overall pre-mining water quality over the entire extent of the aquifer that has been mined and adversely affected by mining;

(d) There is reason to conclude from the record of previous NRC-regulated mining operations that the Target Restoration Values (TGVs), established *seriatim* in a private post-licensing consultative process between the NRC and the Licensee as wellfield expansion proceeds, will be achieved in practice prior to wellfield abandonment, and will ensure that the License by its terms protects “public health and safety,” as the NRC is mandated to do by the Atomic Energy Act.

(e) That any fallback standards (e.g., “Maximum Concentration Limits,” “Alternative Concentration Limits”) subsequently employed in an amended License to terminate aquifer restoration efforts short of achieving TGVs will nonetheless ensure adequate

protection of the “public health and safety,” as the NRC is mandated to do under the Atomic Energy Act, and avoid, minimize, or mitigate other adverse environmental impacts, as required under NEPA

37. Page 2-33, line 11: “The Applicant proposes that concurrent ISR operations and aquifer restoration would occur when several of the first well modules have been depleted and are ready for restoration activities (Strata, 2011b). As aquifer restoration occurs in depleted well modules, ISR operations would be ongoing in subsequent well modules.”

NRDC Comment:

(a) (1) Please clarify the difference between a “well module” and a “well-field” for the purposes of establishing accountable units for implementing and assessing aquifer restoration.

(2) How many lixiviant injection and uranium recovery wells will comprise a typical Ross Project “well module,” and how many such “well modules” will comprise a “wellfield,” and how many wellfields will ultimately be deployed pursuant to the granting of a license to the “Ross Project?”

(b) Will the “post-licensing, [i.e. post-drilling, post-construction, post-testing] pre-operational constituent concentrations” found in perimeter groundwater monitoring wells and so-called “baseline recovery wells” [ER, p. 6-11] be applied—for the purpose of determining the Target Restoration Values (TRVs) obliquely referenced on page 6-11 of the Applicant’s ER—to individual “well modules,” or to a group of “several well modules,” or to a “well-field?” Please be specific in your answer.

(c) What has been the NRC’s established practice to date in regard to the question posed in (b) above, prior to the proposed licensing of the “Ross Project?”

(d) How many discrete environmental accountancy areas – i.e. groups of location-specific UCLs and TRVs—will be established within (1) the Ross Project, and (2) within the scheduled “Lance District Development” that is directly tied to the use of the Ross Project CPP—to detect and control excursions and set standards for aquifer restoration?

(e) Who is responsible for establishing and maintaining this large and complex data set of water quality measurements, and where will it be maintained?

(f) Who initially formulates and proposes module -specific UCLs and TRVs based on these measurements—the Licensee or NRC?

(g) How will the relevant UCLs and TRVs applicable to each specific module be communicated to the field personnel responsible for detecting and preventing excursions and assessing aquifer restoration at particular sites.

(h) With a small workforce covering so many individual environmental compliance units that must be monitored and assessed, how will the Applicant and NRC avoid the confusion or misapplication of standards between units?

(i) Please provide a full and NEPA compliant description of the NRC’s process for reviewing and validating the environmentally protective character of UCLs and TRVs proposed for inclusion in the Ross project license over time;

(j) If there are differences in view between NRC and the Applicant on the establishment or revision of UCLs and TRVs, how will these differences be adjudicated and resolved? Who within NRC holds the final decision authority on such matters?

(k) How will NRC verify the authenticity of the large number of site-specific data sets required under the module-by-module standard-setting approach?

(l) Please identify prior NRC-licensed uranium ISR operations that

(1) Have conducted “aquifer restoration” activities in the manner described in the Draft SEIS: i.e. “as...restoration occurs in depleted well modules, ISR operations would be ongoing in subsequent well modules.” (SEIS, 2-33, line 13).

(2) Please provide a detailed discussion of historical evidence, if any, showing that such parallel production and aquifer restoration efforts pursued at the “well module” level, with TRVs tailored to each well module or “wellfield,” have been successful at restoring groundwater to pre-mining baseline values over the full extent of the mined aquifer.

(m) Please provide a map showing the location and planned restoration sequence of the Ross Project “well modules” that would undergo restoration, relative to those modules in which “ISR operations would be ongoing” at the same time.

(n) Please provide detailed topographic and stratigraphic maps showing the location, relative to the “Ross Project,” of all “subsequent well modules” in contiguous areas currently scheduled for “Lance District Development” in which “ISR operations would be ongoing” while “Ross Project” well modules are undergoing “aquifer restoration.”

(o) Which subsequent ongoing ISR operations, if any, would be hydrologically up-gradient of well modules undergoing simultaneous “aquifer restoration?”

(p) Would all “well modules” undergoing restoration be hydrologically up-gradient of well modules in which ISR operations would be ongoing?

(q) (1) Please define and describe a “baseline recovery well,” as the term is used in the Applicant’s ER.

(2) Is the use of “baseline recovery wells” included in the “post-licensing, pre-operational” scheme (for characterizing baseline water quality and establishing UCLs and TGVs for each “well module” or “wellfield”) that is partially and inadequately described in the SEIS?

(r) If so, please provide a detailed description of how and when data from these “baseline recovery wells” will be acquired and used in concert with other data sources to establish TRVs for each “Ross Project” well module or wellfield, provide the number of such recovery wells that will be used for baseline sampling in each discrete baseline monitoring and excursion control area, and where these wells would be located in an actual Ross project well module or wellfield design, relative to the perimeter monitoring wells.

38. Page 2-33, line 31: “The pumping rates used would depend on the hydrologic conditions at the Ross Project, and the duration of the aquifer sweep and the volume of water removed would depend on the volume of the aquifer affected by the ISR process.”

NRDC Comment:

- (a) Please provide an explanation of the specific existing, planned or expected “hydrologic conditions” at the Ross Project that will affect the pumping rates, duration, and volume of water removed during “aquifer sweep.”
- (b) Please explain why these particular hydrologic conditions have not already been ascertained or modeled based on the results of pre-licensing site investigations;
- (c) How do these hydrologic uncertainties affect the forecast efficacy of the NRC’s efforts to ensure environmentally protective “aquifer restoration;”
- (d) Please provide a detailed and adequate NEPA discussion that relates the prevailing uncertainties in hydrologic knowledge of the “Ross Project” and “Lance District Development” areas to the Licensee’s ability to achieve, and the NRC’s ability to enforce, Target Restoration Values (TRVs) that will be sequentially established “post-licensing” and added incrementally to the terms of Applicant’s NRC License.
- (e) What is the range of potential environmental outcomes, in terms of the restoration of the relevant baseline water quality concentrations, arising from uncertainties in “hydrologic knowledge” of (1) the “Ross Project” area and (2) the wider area encompassed by scheduled “Lance District Development” (see Figure 2.6)?
- (f) Based on the record of previous and ongoing uranium ISR operations in (1) this GEIS “Milling Region,” and (2) within the state of Wyoming, please compare and weight the likelihood of achieving representative alternative sets of post-mining water quality concentrations for the relevant constituents that must be monitored and controlled to ensure public health and safety and minimize harmful environmental impacts and the irretrievable commitment of natural resources.

39. Page 2-33, line 36: “The Applicant’s aquifer restoration plan calls for removing up to 0.5 pore volumes of water during ground-water sweep (Strata, 2011b). Additional pumping would occur in select areas that would be identified during facility operation. The pumping rate is estimated at 284 L/min [75 gal/min] from well modules in the ground-water sweep stage.”

NRDC Comment:

This paragraph discloses almost nothing about the likely range of environmental impacts from aquifer restoration activities.

- (a) If an Applicant’s aquifer restoration plan “calls for” the removal of “up to” 0.5 pore volumes during ground-water sweep, does this mean that this number represents a hard and fast regulatory limit on the amount of water that will actually be removed during ground-water sweep?
- (b) Please provide a table showing the actual pore volumes removed from prior and still ongoing ISR operations in:
 - (1) This GEIS Milling region; and
 - (2) Within the State of Wyoming; that have undergone “aquifer restoration.”

(c) Please provide a table showing “expected” and “maximum allowable” pore volumes per “well module” (or other applicable unit for aquifer restoration) that would be removed in the course of aquifer restoration activities for the “Ross Project,” translate these values into total gallons of water removed per well-module, per well-field, and for the “Ross Project” as a whole, and estimate the time required for the full extent of the Ross Project’s mined aquifer to recover to its natural background or pre-mining pore volume, based on this range of requirements for “groundwater sweep.”

(d) Please provide a discussion --

(1) Comparing the environmental risks and benefits from high levels of pore volume removal from the mined aquifer with the environmental risks and benefits of failing to attain License-specified TRVs (or lesser fallback standards) for aquifer restoration.

(2) Please describe the methodology the NRC and/or the Applicant will employ to evaluate environmental restoration decisions regarding this tradeoff, and the point at which concerns regarding the consumptive use of groundwater may trump the achievement of particular Target Restoration Values.

(e) To enable an adequate NEPA assessment of water quantity impacts, please provide the same pore volume and gallons withdrawn estimates as in (b) above for the projected numbers of “restored” well-field modules falling into the following two categories,

(1) included in the contiguous (to the Ross Project) and already scheduled “Lance District Development;” (see Figure 2.6)

(2) Other “reasonably foreseeable” “Lance District Development” that would likewise utilize the “Ross Project” CPP; and provide an explanation of the methodology used in producing these estimates.

40. Page 2-33, line 40: “The Applicant proposes to use ground-water sweep selectively (for example, around the perimeter of the wellfield) rather than throughout the entire well module to minimize the consumptive use of groundwater.”

NRDC Comment:

This statement again gives rise to ambiguity regarding what the environmental baseline accounting unit for aquifer restoration will be: a “wellfield,” an “entire well module,” as stated above, or a group of several “well-modules” as suggested in lines 11-14. Please clarify the ambiguity.

41. Page 2-34, line 41: “The need for aquifer stabilization would be determined on a case-by-case basis and would depend upon how effectively the sweep and recirculation processes restore the affected aquifer to the license required standards.”

NRDC Comment:

What are the NRC’s “license required standards” for the “Ross Project,” and for the scheduled “Lance District Development” shown in Figure 2.6 on page 2-8 of the Draft SEIS? I cannot find these “standards” listed anywhere in the SEIS.

42. Page 2-34, line 43: “Following aquifer restoration, the Applicant would monitor the ground water by quarterly sampling to demonstrate that the approved standard for each constituent has been met, and that any adjacent nonexempt aquifers are unaffected.”

NRDC Comment:

- (a) What is the “approved standard for each constituent” that will be subjected to monitoring “to demonstrate that the approved standard...has been met” for aquifer restoration?”
- (b) Please provide the specific water quality standards that will be used “to demonstrate...that any adjacent nonexempt aquifers are unaffected?”
- (c) What happens if “quarterly sampling” demonstrates that one or more “adjacent nonexempted aquifers” are affected?
- (d) Who would conduct this quarterly sampling, and if it is the Licensee, how would the NRC obtain independent verification of the results?
- (e) What do the mutually agreed terms of the proposed NRC license for the “Ross Project,” issued to the Applicant in late 2012, require the Licensee to do in the event “adjacent non-exempted aquifers” are adversely affected by ISL mining or aquifer restoration efforts?

43. Page 34, line 32: “If the oxidized (i.e. the more soluble) state is allowed to persist after uranium recovery is complete, metals and other constituents such as arsenic, selenium, molybdenum, uranium and vanadium could continue to leach and remain at elevated levels. To stabilize these constituent concentrations, the pre-operational oxidation state in the ore zone must be reestablished as much as is possible.”

NRDC Comment:

- (a) For the purposes of this SEIS analysis, what has the NRC deemed to be “elevated levels” for the above-named constituents?
- (b) Please provide the range of historically- and geotechnically-indicated minimum, maximum, and most-likely (expected) “elevated levels” for each of the above named constituents that could result from the NRC’s decision to grant the “Ross Project” license, and discuss the scientific and technical basis for the information provided?
- (c) What is the “pre-operational oxidation state” in the proposed ore zones of the “Ross Project” and scheduled “Lance District Development” shown in SEIS Figure 2.6?
- (d) Would the “pre-operational oxidation state” of these ore zones differ from their baseline “pre-licensing state?”
- (e) If so, please identify the known and likely factors contributing to this difference? If not, why does the NRC not employ the measured “prelicensing” baseline oxidation state of the ore zone as the value to be “reestablished as much as possible?”
- (f) How much is “as much as possible?” What are metrics that the Applicant will employ, and/or the NRC will enforce, to establish that “the pre-operational oxidation state in the ore zone” has been “reestablished as much as possible?”
- (g) Would “as much as possible” be less than the TRVs specified in the Applicant’s NRC license? If so, what elevated concentrations of the “dissolved metals” enumerated on page 2-34, line 33-34 of the SEIS would be deemed acceptable for terminating the

“aquifer stabilization” phase of aquifer restoration under the proposed Ross Project license?

44. Page 2-34, line 45: “The Applicant would reinitiate the entire aquifer restoration phase if stabilization monitoring determines it is necessary. Both WDEQ and the NRC must review and approve all monitoring results before aquifer restoration would be considered to be complete.”

NRDC Comment:

This vague statement leaves many obvious and important environmental questions unaddressed—

- (a) What are the specific environmental monitoring benchmarks that will determine whether it is “necessary” to “reinitiate the entire aquifer restoration phase” for the “Ross Project” and scheduled follow-on “Lance District Development” efforts;
- (b) Please provide a list or table showing any and all historical instances in which the NRC has directed the recipient of an ISL license to “reinitiate the entire aquifer restoration phase” following a failure of the first aquifer restoration phase to achieve the TRVs specified in the license, and the resulting improvements in measured environmental benchmarks obtained thereby.
- (c) The SEIS states that the NRC “must review and approve all monitoring results.” How will the NRC go about independently confirming or otherwise verifying the authenticity, accuracy, and completeness of the “monitoring results” that it will “review and approve” for the “Ross Project” and other scheduled “Lance District Development”?
- (d) Please provide a complete list of the water quality standards and criteria that the NRC will apply when it makes a determination on whether “Ross Project” aquifer restoration “would be considered to be complete.” Which of these standards or criteria are considered binding on the Agency and the applicant, and which can be abandoned or modified at will using the agency’s enforcement discretion?
- (e) Which official or officials within NRC are entrusted with the responsibility and authority to approve monitoring results and declare aquifer restoration “to be complete?”
- (f) What does “aquifer restoration” really mean if uranium ISR wellfield construction and testing and ISR operations are ongoing in adjacent portions of the same hydrologically connected formation, and neither the starting nor finish lines for assessing groundwater degradation and restoration have been established in advance as being both environmentally protective and legally binding on the Applicant and the NRC.
- (g) For how long will the proposed license require the Applicant “to monitor the groundwater by quarterly sampling to demonstrate that the approved standard for each constituent has been met and that any adjacent nonexempt aquifers are unaffected?”
- (h) Please provide the “approved standard for each constituent” that will be used to conduct this quarterly monitoring, and the standards for determining that “any adjacent nonexempt aquifers are unaffected.”
- (i) What does “adjacent” mean in this context?

45. Page 2-35, line 9: “Prior to the Ross Project’s facility decontamination, dismantling, and decommissioning...”

NRDC Comment:

- (a) Please provide the earliest and latest dates at which this facility D & D could reasonably be expected to occur based on the current mining plans of the Applicant in the Lance District?
- (b) Is the “Ross Project facility” named above the same as the “Lance Projects Central Processing Plant (CPP)” described by Applicant Strata Energy’s parent company, Peninsula Energy, Ltd., in releases to the global investing community?
- (c) If so, why is it referred to in this DSEIS by a different name?

46. Page 2-35, line 10: “...appropriate cleanup criteria for surfaces would need to be established in concert with NRC requirements.”

NRDC Comment:

- (a) What are the current NRC requirements, if any, for “appropriate cleanup criteria for surfaces” of ISL plants in the D&D phase?
- (b) When and how would the criteria required for cleanup of surfaces at the “Ross Project facility” be determined?
- (c) Please provide a table showing the expected levels of radioactive and chemical contamination before and after decontamination of a typical ISL facility similar in size to the Ross CPP.
- (d) If the data requested in (c) is time dependent, please present showing how the contamination levels pre- and –post decontamination may vary with the plants operating history.

47. Page 2-35, line 12: “...a Ross Project-specific decommissioning plan (DP) would need to be accepted by the NRC. The Applicant has committed to satisfying these NRC requirements for decontamination and decommissioning.”

NRDC Comment:

- (a) When would a “Ross Project-specific decommissioning plan DP)...need to be proposed by the Applicant?
- (b) When would it “need to accepted by the NRC?”

48. Page 2-35, line 17: “...to identify those areas at the Ross Project that would need decontamination to meet applicable cleanup criteria or those that cannot economically meet the criteria (Strata, 2011b).”

NRDC Comment:

- (a) Please describe the difference between “cleanup criteria” and “applicable cleanup criteria.” When would cleanup criteria in the DP not be “applicable?”
- (b) What happens when a contaminated area “cannot economically meet the criteria” established in the DP?

49. Page 2-35, line 21: “The onsite excavated pits, or “mud pits,” used for disposal of drilling fluids and muds (or “cuttings” during the installation of wells, would be included in the survey to ensure no long-term radiological impacts (Strata, 2011a).”

NRDC Comment:

- (a) Please estimate the total number, land area, and approximate locations of all mud pits that will be created in the complete cradle-to-grave life cycle of drilling for the following: the “Ross Permit Area;” “Ross Amendment Area # 1;” “Kendrick Production Unit (Amendment Area #2);” Richards Production Unit (Amendment Area # 3); Barber Production Unit (Amendment Area # 4); all “Lance District Development,” including the preceding named areas and units, plus “the Warren Project,” the “Richards Project,” the “Osborne Project,” the “Chatterton Project,” the “Brooks Project,” the “Carey Project,” the “Houx Project,” the “Clark Project,” the “Lucas Project,” and the “Emerson Project;” all of the preceding, plus ISL mining-to-depletion of the entire “Lance District” uranium resource under the control of the Applicant?
- (b) What about any long-term chemical as well as radiological impacts of these drilling “mud-pits?” Please describe the specific chemical as well as radiological constituents of the “Ross Project” and “Lance Projects” drilling muds, and any potential short and long-term hazards they may present to the human and natural environment, including crops, livestock, and wildlife, from leaving them in place.
- (c) Are these radiological and chemical constituents of drilling muds expected to be consistent across all uranium-ore bearing areas of the “Lance District,” or could they vary significantly depending on local drilling conditions and the specific characteristics of the ore-bearing formations?
- (d) Please provide expected ranges for the concentrations and activity levels for all constituents of these drilling muds, including radioactive decay products over time, for every area planned to be mined under the Proposed License and any planned amendments thereto.
- (e) Which constituents present the highest risk of mobilization in the event of (i) erosion and flooding; (ii) dessication and wind-blown dispersion?
- (f) Which constituents present the greatest risk of uptake in the food chain?
- (g) Are these mud-pits subject to the “applicable cleanup criteria” in the Applicant’s NRC-approved “Ross-Project-specific” decommissioning plan (DP)?
- (h) What standards would be applied to these mud pits in the Applicant’s decommissioning plan to determine whether they present “no long-term radiological (and chemical) impacts” if left in place?
- (i) If the “radiation survey” referenced in lines 16 – 25 documents the existence of a long-term radiological or chemical hazard at some or all of these “mud-pits,” what will the Applicant’s NRC-approved DP require in the way of cleanup?
- (h) Could some or all of these mud pits qualify for a determination that they “cannot economically meet the criteria” for cleanup?
- (i) If a survey documents that some or all mud-pits will have long-term adverse environmental impacts, and some or all of these mud pits qualify for a determination that they “cannot economically meet the criteria” for cleanup, what steps will be taken, if any, to mitigate their environmental risks?

(j) Please briefly summarize and provide detailed citations to technical literature demonstrating that the cumulative impacts of many thousands of such contaminated mudpits in an area of 90-120 km² does not present an elevated risk of environmental harm.

50. Page 2-36, line 6: “However, at the Ross Project, complete decontamination...and decommissioning...could occur years after the wellfields begins to be decommissioned and the aquifer begins to be restored.”

NRDC Comment:

- (a) Could occur or would occur? Why the use of the conditional tense? Don't the economic rationale for the “Ross Project” CPP and the Applicant's licensing strategy both depend on bringing numerous additional wellfields into production beyond the initial Ross Permit area considered in this SEIS?
- (b) How long would the CPP remain in operation after the first “Ross Project” wellfield “begins to be decommissioned” if the Applicant's business plan for mining the entire Lance District region is realized?

51. Page 2-36, line 32: “All wastes and the equipment associated with surface impoundments...disposed of appropriately or released for unrestricted use...The soil beneath the surface impoundments would be analyzed for radioactive contamination, and any areas that exceed the cleanup criteria for unrestricted release would be excavated and disposed of at a licensed radioactive waste disposal facility.”

NRDC Comment:

- (a) Would the “soil beneath the surface impoundments” be examined for chemical contamination?
- (b) How wide an area around and down gradient from the mudpits will be examined for contamination that may have migrated through seepage, leaching and erosion?
- (c) What are the specific criteria that would be applied to determine the choice between “disposed of appropriately” and “released for unrestricted use?”
- (d) With 750 to 1000 individual wells estimated for the Ross Project, how many total acres of: (1) “excavated mudpits;” and (2) surrounding land; will be examined for radioactive and/or chemical contamination?
- (e) Please provide the data requested in (d) for all planned “amendment area” expansion wellfields (including all disposal and monitoring wells) with output that would be processed in the “Ross CPP” (aka the “Lance Projects Central Processing Plant”) with the next 10, 15, 20, 25, 50, and 70 years.
- (f) Would these mudpit zones be subject to the same radiation survey and evaluation process mentioned on page 2-35, line 18, which could result in a determination that some or all of them requiring cleanup “cannot economically meet cleanup criteria?”
- (g) Would mudpit areas that meet cleanup criteria be suitable for reseeded and livestock grazing? If not, how will they be identified to prevent same?
- (h) If mudpit areas that do not meet cleanup criteria are left in place because they “cannot economically meet cleanup criteria,” do they present any future contamination threat to

the livestock or wildlife food chains, or to surface or shallow groundwater resources?
Please characterize the chemical and radiological nature of this threat?

52. Page 2-38, lines 8 – 41, Airborne Emissions:

NRDC Comment:

(a) Please provide the full lifecycle CO₂ –equivalent emissions per-pound-of-yellowcake to be produced from the “Ross Project, including in this calculation all on-site and off-site sources of electricity and fossil-fueled thermal combustion required for all phases of the Ross Project, including aquifer and site restoration. Please make all components of this calculation transparent.

(b) What is the estimated lifetime output, measured in pounds of yellowcake, of the “Lance Projects Central Processing Plant,” (aka the “Ross Project” CPP)?

53. Page 2-39, line 10: “The Applicant has committed that these [radon] discharges would meet all local, State, and Federal requirements related to air quality as well as occupational health and safety (Strata, 2012b).”

NRDC Comment:

(a) Please describe how the NRC, or if not the NRC, other government agencies will monitor and confirm the Applicant’s compliance with these requirements?

(b) Please describe any and all historical instances in which the NRC or another agency has cited or fined an ISR facility for failure to comply with radon-monitoring, -ventilation, or -personnel protection requirements.

54. Page 2-39, line 39: “The composition and quantities of liquid waste from Ross Project processes related to uranium recovery are similar to those ranges provided in Table 2.7-3 of the GEIS (NRC, 2009);”

NRDC Comment:

Attempting to quantify the output of liquid wastes from the “Ross Project” by saying that it is “similar to a range” provided in some other document conveys no useful information and fails to comply with NEPA, which requires that important environmental parameters be quantified wherever possible.

(a) Please provide estimates of the total quantity and composition of liquid waste requiring deep well disposal from:

(1) The “Ross Project,”

(2) All future “Lance Projects” that would utilize the CPP;

(3) All “satellite IX facilities” planned by the Applicant in connection with future use of the CPP.

(b) Please provide the number, planned locations, target aquifers, and required capacities of all deep disposal wells that would be created by executing:

(1) The Applicant’s current plan to solution-mine the Ross, Kendrick, and Barber “amendment areas;”

(2) the Applicant’s future plans to mine all the projects identified in its corporate parent’s long range business plan for “Lance District Development,” including

“the Warren Project,” the “Richards Project,” the “Osborne Project,” the “Chatterton Project,” the “Brooks Project,” the “Carey Project,” the “Houx Project,” the “Clark Project,” the “Lucas Project,” and the “Emerson Project; ”
(3) All of the preceding, plus ISL mining-to-depletion of the entire “Lance District” uranium resource under the control of the Applicant?

55. Page 2-40, line 36: “The applicant expects the capacity of each of the five Class 1 wells to range between...” You have expressed the “capacity” of a disposal well as a flow-rate, not as a limit on the total amount of liquid wastes injected.

NRDC Comment:

- (a) What determines the actual amount of liquid waste that each deep injection well can accommodate, and how is this limit expressed?
- (b) Is there a limitation imposed on the maximum injection pressure, or on the resulting water pressure in the deep formation that is receiving the waste, and what is (are) this limit(s) for the Ross Project and for subsequent “Lance Projects”?
- (c) Would all deep disposal wells associated with uranium yellowcake produced pursuant to the proposed license be targeted in the same formations (Deadwood and Flathead) as targeted by the five deep disposal wells permitted for the “Ross Project.”?

56. Page 2-40, line 41: “Net annual evaporation of brine in the surface impoundments would be 5.3 L/min-ac [1.4 gal/min-ac] which would reduce the volume of brine injected in the disposal wells (Strata, 2011b).”

NRDC Comment:

- (a) Please provide the total quantity and percentage of total produced brine that would be disposed via evaporation.
- (b) Please quantify the amounts of radon or other hazardous gases that might be released via evaporation from the “surface impoundments.”

57. Page 2-41, line 27: “The Applicant estimates that a volume of 22,000 L (6,000 gallons) of water and 12 m³ [15 yd³] of drilling muds would be produced per well.”

NRDC Comment:

Please explain the derivation of these numbers.

- (a) Do they represent an average value of “produced water” and drilling muds per well sunk into the ore zone only, or do they include the deep wells, which one would expect to be about 16 times greater, based on a ratio of their respective depths.
- (b) Please provide separately the values for produced water and drilling muds from the drilling of deep disposal wells into the Deadwood and Flathead formations.

58. Page 2-41, line 30: “The Applicant expects the production of ground water during operations and decommissioning of wells completed outside of the aquifer exempted for uranium recovery (Strata, 2011a). This ground water would be discharged under a temporary WYPDES Permit.”

NRDC Comment:

- (a) How many wells, of what type, into which formations, are covered now under the terms of this “temporary permit?”
- (b) How many wells will be drilled and covered by this permit in the future;
- (c) How long is the term of the renewed permit?
- (d) Where and how is the groundwater “discharged” under the terms of this permit?

59. Page 2-43, 44, lines 39-9 “Financial Surety.”

NRDC Comment:

With a history of failures in efforts to adequately restore contaminated aquifers at ISL uranium mining sites, the subject of financial surety is of concern. Please provide:

- (a) A full (and comparative) accounting of each and every original financial surety required by NRC or relevant state agencies for ISL uranium mines, including the type of surety arrangement (e.g., bonds, cash deposits, certificates of deposit, parent company guarantees, etc.).
- (b) What was the basis for the initial surety requirement?
- (c) Were there license conditions requiring each of these surety arrangements?
- (d) Were the surety estimates for funding the entirety of groundwater restoration and decommissioning the facility adequate in each instance? If not, why not?
- (e) How often were updates required of each surety at each ISL mining site?
- (f) If at any point a surety was not adequate to meet the costs of restoration and decommissioning, what entity provided funding for continuing restoration?

60. Page 2-44: “As of October 2010, the applicant has located 759 of the 1682 holes thought to exist from Nubeth exploration activities and has plugged 55 of them (Strata, 2011b).”

NRDC Comment:

(a) Based on historical records, how many previous drill holes from all sources (e.g. oil, gas, uranium, water exploration and extraction) are believed or known to exist on (1) the Ross Project site; (2) the area encompassed by future planned “Lance District Development?” Please provide a map showing the boundaries of this wider area.

(b) How many of the preceding holes described in (a) have been located, and how many have been plugged?

(c) Does the total of 1682 holes from “Nubeth exploration activities” include the wells that were drilled for Nubeth’s abortive production operation? How many of the latter are there?

(d) (1) Of the known subset of holes associated with Nubeth exploration activities, how many has Strata located to date (May 9, 2013);

(2) How many of these have been plugged?

(3) How many of these have been correctly plugged or replugged to modern well abandonment standards?

(e) Of the larger number of drillholes from all sources, how many of these has Strata located, and how many of these have been correctly plugged to ensure that no vertical or horizontal migration of lixiviant occurs, or any migration of otherwise altered water outside the permitted area of the mined aquifer?

61. Page 2-44, line 2: “Alternative 3: North Ross Project.”

NRDC Comment:

The ER and DSEIS contains no evidence that other CPP location alternatives were screened for their environmental advantages and disadvantages prior to selecting the “North Ross Project” for detailed NEPA analysis.

(a) Please explain why this alternative, and not others, was deemed more reasonable than other potential CPP location alternatives, and provide evidence that an environmentally-based screening process was used to identify environmentally preferred sites;

(b) What environmental or other criteria elevated the North site and the chosen Ross site above other alternative sites?

(c) Please provide a detailed discussion of why the selected Ross Site is the environmentally preferred site within the Lance District areas acquired, optioned, or leased by Peninsula Energy Ltd/Strata Inc., for ISR of uranium.

(d) Strata’s Australian parent company, Peninsula Energy, Ltd., has proposed [“Lance-Development Model,” March 21 presentation 2013 Hong Kong Mines and Money conference] that a satellite ion exchange facility will be part of the planned “Barber Production Unit” in the southern part of the Lance District. A location in this area, closer to the towns (Gillette and Moorcroft) where the plant workers are likely to live, would appear to offer environmental advantages in terms of minimizing dust and transport emissions during construction, operations, product shipments, workforce commuting and decommissioning. What consideration, if any, was given to locating the CPP here, much nearer to paved roads and the main I90 east-west transportation corridor?

(e) Please describe the comparative environmental and other factors, relative to other candidate CPP sites considered, that led to the selection of the (south) Ross project site as the preferred site for building the CPP and the first wellfields to be constructed under the proposed licensing action.

62. Page 2-46, line 35:

NRDC Comment:

In discussing the alternative (eliminated from detailed analysis) of possibly employing conventional mining and milling to extract the Lance District resource, the DSEIS states that “the uranium ore in the Lance District is low-grade...” and located at “nearly the maximum depth for surface mining to practically recover uranium from an open pit.”

(a) Please give the definition of “low-grade” uranium ore used here.

(b) Is uranium mineralization of 4 to 5 feet at 1000-1300 parts per million (ppm) considered “low grade?”

(c) If the Ross Project uranium is indeed “low-grade,” please provide a NEPA analysis showing that on balance, developing this Lance District resource, at the cost of incurring some measure of unavoidable adverse environmental impacts, particularly on groundwater, is worth the socio-economic benefits that would flow from this decision in light of available alternatives to the proposed licensing action.

(d) For example, if Canadian uranium imports from the Athabasca Basin can be tunnel-mined from an ore body that is on the order of 200 times richer than the Lance District’s (concentration of 0.1% versus 20% at MacArthur River) thus in principle incurring significantly fewer environmental impacts per ton of U308 product extracted, and this rich mining district is located in a remote area that is literally saturated with vast surface and groundwater resources, why then does it make environmental sense to impair relatively scarce groundwater resources to mine uranium in a semi-arid region of eastern Wyoming, water that would otherwise be available to support livestock, crop irrigation, and human consumption (the city of Gillette even today, much less at some parched time in the future, taps the Fox Hills/Lance aquifers for water that is blended Madison formation water with lower TDS values to yield potable water, and thus the aquifers to be degraded by the licensed mining comprise a source of human drinking water.)?

(e) Could the extended mining contemplated by Applicant in the planned southern “Barber Production Unit” of the Lance District, under so-called “amendments” to this proposed License, threaten future use of the above-mentioned municipal, and other actual and potential wells in the area, as a source of drinking water via blending? A planned “Warren Project” at the far southern end of the Lance District [avg. 10 ft. of mineralization @ 700 ppm eU308] would apparently come even closer to the town of Moorcroft. Please provide a technical justification for your answer.

(e) Please provide a detailed map showing the location of the Moorcroft and Gillette wells tapping the Fox Hills/Lance formations and or nearby aquifers in relation to the planned southern “Amendment Areas” that could be added to the proposed “Ross Project” license.

63. Page 2-50, line 46: “The Applicant has estimated that the 2.5 ha [6.3 ac] available for evaporation in the Proposed Action would provide 33.3L/min [8.8 gal/min] of average annual

evaporation. Linear extrapolation suggests that 65 ha [160 ac] is the minimum surface area required for evaporation of all brine and other byproduct waste generated at the CPP.”

NRDC Comment:

How was the proposed surface area of 6.3 acres for the CPP surface impoundments arrived at? Why was not a larger or smaller acreage proposed? What were the environmental and operational factors considered?

64. Page 2-52, line 18: “During operations there would be a MODERATE impact to ore-zone aquifer water quality due to excursions...”

NRDC Comment:

(a) What is the technical basis for the apparent view expressed here that a “moderate” degradation of mined aquifer water quality would be “due to excursions,” rather than to the real time effects of mobilizing uranium and other constituents of the ore-bearing sandstones (like radium and selenium) known to be harmful to human and animal health?

(b) Expressed quantitatively, as a deviation from the pre-licensing site-characterized baseline levels, what does a “MODERATE” impact on mined aquifer water quality mean in this context?

65. Page 2-52, line 20: “...however, with measures in place to detect and resolve excursions, the impacts would be reduced.”

NRDC Comment:

(a) Please quantify the meaning of “reduced” in this context – from what to what?

(b) With the ability in place to “detect and resolve excursions,” does this mean that the impacts on the mined aquifer would be no longer “MODERATE,” and therefore “SMALL”? What does “SMALL” mean quantitatively in this context, expressed as a deviation from pre-licensing site-characterized baseline levels?

(c) Does anyone in NRC have the intestinal fortitude to acknowledge the utterly circular and syllogistic nature of this ludicrous mode of fact-free environmental analysis?

(d) “During aquifer restoration there would be a MODERATE impact to ore-zone aquifer water quantity to short-term drawdown...” Please define the possible range of time that NRC associates with “short-term” drawdown of an aquifer, and explain why this length of time would impose only a “moderate” environmental impact on current and potential future users of the aquifer. If a “restored” aquifer fails to recharge fully after thirty years, is this a “moderate” impact?

(e) What about impacts to ore-zone aquifer water quality during and after “restoration?” The NRC staff’s conclusions stated on page 2-52 include water quality impacts during operations, but say nothing about these impacts during and after “restoration?” Are we to presume that there are no water quality impacts arising from and/or enduring past the restoration phase of the Ross Project?

(f) Since it is well known that there are such lasting impacts, expressed as prolonged deviations from pre-mining baseline levels for key constituents whose concentrations determine the relative human potability and other uses of groundwater, please describe the

deviations from baseline water quality values expected in the Ross Project, and subsequent Lance Projects.”

66. Page 2-53, line 1-6: “Regarding groundwater, the portion of the aquifer(s) designated for uranium recovery must be exempted as underground sources of drinking water before ISR operations begin.”

NRDC Comment:

- (a) Why is this exemption necessary if, as claimed in the same paragraph, “Strata would also be required to restore groundwater parameters affected by the ISR operations to levels that are protective of human health and safety?”
- (b) In other words, if Strata must restore groundwater parameters affected by ISR operations to levels that are “protective of human health and safety,” why is it necessary to exempt the aquifer in the future from serving as a potential source of drinking water? Please explain this apparent contradiction.
- (c) What are the levels for key constituents of the “restored” mined-out aquifer that the NRC deems “protective of human health and safety?” If these levels are truly protective of human health and safety, why can’t the restored aquifer serve as a source of drinking water? If it can’t serve this function, is it reasonable or legitimate to say that the aquifer has been “restored” to a level that is “protective of human health and safety,” including future uses that humans depend on, such as watering livestock and crop irrigation?
- (d) The only way to decipher and make sense of this apparent contradiction, which arises from purposefully vague writing, is to interpret the phrase “restore groundwater parameters affected by ISR operations” as excluding the mined aquifer itself. Then the problematic phrase reduces to, “Strata will protect human health and safety as it relates to current and future uses of aquifers beyond the ore zone.” Although no quantitative demonstration is provided showing Strata’s pathway to achieving even this more limited goal, at least read this way the assertions in this problematic paragraph begin to make logical sense! Please clarify that this is what the paragraph at the top of page 2-53 is intended to convey, even though it is drafted to leave an impression of a more robust groundwater restoration capability.

Section 3: Affected Environment

67. Page 3-1, line 38: “The Ross Project area encompasses approximately 697 ha [1,721 ac] as described in the SEIS Section 2.1.1.”

NRDC Comment:

- (a) Please provide (and show on a map) the total land area encompassed and affected by Applicant Strata Energy’s proposed “Lance District Development” (referenced in Figure 2.6) and “The Lance Projects,” given by sources other than this deficient DSEIS as the following: the “Ross Permit Area;” “Ross Amendment Area # 1;” “Kendrick Production Unit (Amendment Area #2);” Richards Production Unit (Amendment Area # 3); Barber Production Unit (Amendment Area # 4); “the Warren Project,” the “Richards Project,” the “Osborne Project,” the “Chatterton Project,” the “Brooks Project,” the “Carey Project,” the “Houx Project,” the “Clark Project,” the “Lucas Project,” and the “Emerson Project.”

(b) Please provide the total land area and show on a map the boundaries of the area that would be affected by mining the entire “Lance District” to depletion, and discuss all the existing human settlements and existing land uses that would be affected within this wider area designated by the Applicant for uranium development.

(c) Please revise this entire section (Sec. 3) on the “Affected Environment” to encompass a description of all the important environmental attributes of the wider area that could be solution-mined as a direct or foreseeable consequence of the NRC’s proposed licensing action.

68. Page 3-4, line 24:

NRDC Comment:

Include in this paragraph all of the “potential projects” planned for the Lance District by Strata Energy’s corporate parent, Peninsula Energy, Ltd.

69. Page 3-9, line 15 -18:

NRDC Comment:

Please provide the JORC-compliant uranium resource estimates for “recoverable uranium” in the area encompassed by future planned “Lance District Development.”

70. Page 3-38, subsection on existing Groundwater Quality:

NRDC Comment:

The data and discussion in this section is vague, disconnected, and entirely inadequate. It never forthrightly discusses historical and current water quality data from a representative sample of existing wells completed in the Lance and Fox Hills aquifers outside of the previous Nubeth exploration and mining zone, and the sparse data from such existing wells appears to have been dropped from Tables 3.6 and 3.7, which includes only “Nubeth Data” and “Ross Project Monitoring Well Data.”

71. Page 3-43, lines 19 -22:

NRDC Comment:

(a) Please provide a map showing the locations and current uses of the “identified 29 currently operable water-supply wells within the Ross Project area and the surrounding 2-km (1.2 mi) area.”

(b) Provide a similar map for the wider area proposed for uranium ISR by the Applicant, as described earlier in these comments.

72. Page 3-43, line 32 -34: “Domestic wells are generally deeper than stock wells, ranging from 46-180 m [150 – 600 feet] The limited information available on these wells precluded a determination of which aquifer was supplying water to the domestic wells.”

NRDC Comment:

This data gap seems a little too convenient. The referenced depth range of these domestic wells could easily include the Lance/Fox Hills formations. Please provide more information on the supply aquifers and water quality of these domestic wells.

73. Page 3-43, line 37 -38: “The results of the water –quality analyses are provided in the Applicant’s ER...”

NRDC Comment:

Please provide and discuss these results in this SEIS. The public does not read the Applicant’s ER, and it is not a NEPA document.

74. Page 3-43, line 41: “As described below for each type of well, these analyses showed that the local water supply’s contaminants *generally exceeded* EPA’s drinking water standards and *often exceeded* Wyoming’s less stringent quality standards for agricultural use.”

NRDC Comment:

(a) These are tendentious and unsubstantiated conclusions based on the data provided. Sulfate exceeded the standards in 54% of the wells sampled – given inherent measurement and sampling errors, and the small size of the sample, this is hardly a basis for concluding that these wells “generally exceeded EPA’s drinking water standards.” Gross alpha was exceeded in only “4 of the 13 domestic wells,” or 31 % of the wells, again hardly the basis for a conclusion that these wells “generally exceeded” EPA or WDEQ standards.

(b) Likewise, the conclusion for the stock wells that “the water quality of stock wells is variable” does not substantiate the conclusion that water from these wells “often exceeded Wyoming’s less stringent quality standards for agricultural use.” The results summary on page 3-44, line 19, states that “gross alpha exceeded both the Class II standard and the MCL in 7 of the 15 stock wells,” or only 45% of the wells. In other words, more than half the time, they complied with this standard. Selenium exceeded these standards in only 1 of 15 (7%) of wells, which hardly comports with the descriptor “often exceeded.”

75. Page 3-44, line 16: “TDS often ranged from 370 to 1,610 mg/L, often exceeding the EPA Secondary MCL standard...”

NRDC Comment:

Please describe what “often” means in this context. Provide a numerical value to substantiate the claim.

76. Page 3-44, line 16: “Sulfate, ranging from 28 to 679 mg/L, often exceeded ...”

NRDC Comment:

Please describe what “often” means in this context, and provide a numerical value to substantiate the claim.

77. Page 3-103, line 27: “Twenty-nine *local drinking water wells* were also sampled quarterly, beginning in July 2009...”

NRDC Comment:

Please provide a map and tables showing the locations and results, respectively, from this quarterly sampling program of local drinking water wells. If this is an erroneous reference to the sampling of 29 *water supply wells* for all uses given at pages 3-43/44 of this section, then correct the error.

Sec. 4 Environmental Impacts and Mitigation Measures

78. Page 4-3, line 18: “The GEIS defined land-use impacts to be SMALL when they ranged from 50 -750 ha [120 – 1,880 ac].”

NRDC Comment:

This is an arbitrary, capricious, and frankly ridiculous statement. Without a detailed consideration of the environmental attributes of a land area, irrespective of its size, one cannot “define” land use impacts as being anything, much less “Small.”

79. Page 4-3, Table 4.1:

NRDC Comment:

The implication of this misleading chart, that only 280 acres of the total Ross Project area will be “disturbed” by the Proposed Action, is palpable nonsense. Apparently the faulty environmental premise being utilized here is that the land disturbance impacts of the proposed action are limited to only those specific areas which are physically occupied by facilities, equipment, and roads associated with the project, rather than the denial or alteration of existing land uses imposed by the project as a whole. Even on the basis of the narrower phony premise, Table 4.1 fails, as it fails to include the direct land use impacts of mudpits, well-pads, and fenced-in areas. The area occupied by 5 permitted deep injection wells is given as 5 acres, but should be 7 acres based on the given wellpad area of 250 x 250. Compare Table 4.1 with the graphical depiction of the “Ross Project Facility and Wellfields” in Figure 2.4, showing the perimeters of the proposed wellfields occupying what looks to be at least 60% of the Ross permit area.

80. Page 4-6, Transportation:

NRDC Comment:

Reasonable alternatives for locating the CPP to diminish transportation impacts (e.g. dust, carbon emissions, and probability of vehicle accidents) are not examined.

81. Pages 4-11/12, beginning line 48 on page 4-11:

NRDC Comment:

The conclusion in this paragraph that upping the shipment of resins received at the CPP daily from one to four would not affect the risk of accidents is unsubstantiated, and the increased risk arising from shipping four times the yellowcake output obtainable from the Ross Project alone is not even evaluated.

Section 5 Cumulative Impacts

NRDC Comment:

In numerous locations throughout the cumulative impacts discussion the DSEIS foregoes attempts at quantitative analysis of cumulative environmental impacts, or even substantive discussions of qualitative factors. The document achieves this dubious distinction by relying on blanket assumptions that, for a given action or impact (*i.e.*, deep-well waste storage, geologic/soil impacts, etc.), the Applicant will adhere to relevant regulations and monitoring programs. The Staff then interprets this as yet to be demonstrated adherence – an adherence with no basis in historical practices at ISL mines² – as offering some guarantee that the cumulative impacts associated with this action will not rise to a significant level that merits detailed analysis in the EIS, by virtue of the regulation’s or program’s underlying intent to prevent impacts in the first place. It is obvious that the Applicant’s intent to adhere to existing regulations and guidelines should be assumed during the life of the Ross Project; however, this assumed adherence should not serve as a substitute for thorough analysis of impacts and presentation of findings within the SEIS.

82. Page 5-2, line 20: Other Past, Present, and Reasonably Foreseeable Future Actions

NRDC Comment:

² See, NRDC’s *Nuclear Fuel’s Dirty Beginnings*, at 26-33, for historical treatment of ISL mining practices and associated environmental harms. For example, we noted “[e]xcursions and leaks have been serious ongoing problems for many ISL facilities. In issuing a 2007 Notice of Violation to the Cameco Corporation’s Smith Ranch-Highland ISL mine, the state of Wyoming noted: ‘[O]ver the years there have been an inordinate number of spills, leaks and other releases at this operation. Some 80 spills have been reported, in addition to numerous pond leaks, well casing failures and excursions. *Unfortunately, it appears that such occurrences have become routine.*’ The LQD [Land Quality Division] currently has two large three-ring binders full of spill reports from the Smith Ranch- Highland operations.’” (citations omitted and emphasis added). *Found* online at <http://www.nrdc.org/nuclear/files/uranium-mining-report.pdf>, and please incorporate by reference the report as a whole.

The statement is that other industrial activities near Crook County could have environmental impacts that could be greater than the individual impacts of the Ross Project. Because these additional activities are stated to include similar uranium recovery projects, as well as other activities known to impact environmental systems (e.g. oil and gas recovery), it should be assumed that the proposed action is necessarily smaller than the sum of all impacts due to external activities, as opposed to ambiguously representing the proposed action as potentially inconsequential within the context of cumulative impacts analysis.

83. Page 5-4, lines 1-6:

NRDC Comment:

Is the Richards Satellite Area anticipated to serve as replacement capacity to retiring wells, as with the Ross Amendment Area 1, or is it expected to run concurrently, thereby increasing the production rate of the CPP?

84. Section 5.6 Geology and Soils, page 5-18, line 3:

NRDC Comment:

Where is the data presented, or referenced, that shows both the initial (baseline) and post-decommissioning conditions regarding geology and soil on the Ross Project site, thus allowing the conclusion that the geologic and soil conditions of the Nubeth area are no longer relevant in a cumulative impacts analysis for the proposed action?

85. Page 5-18, line 13:

NRDC Comment:

What is the basis for concluding that the geology/soil impacts would dissipate quickly once site restoration is complete? Please provide examples of geologic/soil "disturbances" that are expected in the Ross Project along with previously observed instances in similar projects and their observed recovery times. In light of this data, is a 5-year recovery buffer conservative?

86. Page 5-18, line 46:

NRDC Comment:

Is there not enough information presently available regarding future development of satellite areas and their operational characteristics to more accurately estimate the area of soil disturbance, in contrast to assuming all four sites are identical?

87. Page 5-19, line 3:

NRDC Comment:

To what extent does the cumulative geologic impacts analysis change when considering successive (or replacement) operational capacity versus concurrent operations in potential satellites areas? What justification is there to conclude there will be a SMALL impact as a result of drilling, plugging, and abandonment of holes for either of these operational scenarios, which were both recognized by the Applicant as foreseeable?

88. Section 5.7 Water Resources, page 5-19, line 39:

NRDC Comment:

- (a) Does limiting the geographic area of study to the upper reaches of the Little Missouri River Basin preclude or unnecessarily limit the scope of study on impacts that could be experienced beyond this area of data collection and monitoring?
- (b) What additional watersheds are implicated in the Applicant's plans for extended ISR operations in the Lance District, and what are the cumulative demands on water resources from those projects in conjunction with all other reasonably foreseeable sources of water consumption and/or water quality degradation in the same area?

89. Section 5.17 Waste Management, page 5-48, line 26:

NRDC Comment:

- (a) What methodology was used to determine the 20-year timeframe for evaluating the cumulative impacts of deep-well injection of liquid wastes? Why not a longer timeframe?
- (b) What analysis has been performed specific to the formations existing in the Ross Project area that studies the potential for migration of liquid wastes and the associated timelines for this migration and/or transformation into acceptable forms?

90. Page 5-50, lines 26-33:

NRDC Comment:

- (a) Describe why only using the physical geographic footprint (approximately 0.4 km around each well) in relation to the overall project area is appropriate for assessing the cumulative impacts of 17 deep-injection wells within the Ross Project site and potential expansions, and concluding they are SMALL?
- (b) What data are available on the failure rates and historical performance of deep-well waste storage, particularly in industrial activities similar to ISR? Does this data, when incorporated into the Ross Project cumulative impacts analysis over the entire lifecycle, still allow for the conclusion that these effects are SMALL?

Conclusion

As we noted at the outset, rather than comply with well-established NEPA requirements of taking a “hard look” at the environmental impacts of a clearly defined major federal action, the Draft SEIS submits quantitatively baseless set of environmental conclusions (that impacts will be SMALL or MODERATE on a temporary basis) about an arbitrarily truncated segment of a project that is quite obviously the first step in a much larger plan for mining uranium eastern Wyoming. Complete responses to our detailed comments will commence the process of creating a lawful agency record, but rather than attempt to patch the holes of a leaking ship that lacks the coordinates of its ultimate destination, or, in NEPA terms, the actual scope of the major federal action under review, we urge NRC Staff to withdraw the Draft SEIS, as the agency’s actions fail to meet the requirements of NEPA, 42 U.S.C. § 4321 *et seq.* Further, we urge NRC to direct the applicant to re-submit an Environmental Report that adequately addresses the full scope, duration, and extent of the all the uranium ISR activities and impacts that it plans to conduct pursuant to the major federal action of receiving an NRC license to begin CPP and wellfield construction and operations.

Sincerely,

/s/ (electronic signature)

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY & LICENSING BOARD

In the Matter of)	Docket No. 40-9091-MLA
)	
STRATA ENERGY, INC.,)	ASLBP No. 12-915-01-MLA-BD01
)	
(Ross In Situ Recovery Uranium Project))	May 6, 2013

**NATURAL RESOURCES DEFENSE COUNCIL'S & POWDER RIVER BASIN
RESOURCE COUNCIL'S JOINT MOTION TO RESUBMIT CONTENTIONS & ADMIT
ONE NEW CONTENTION IN RESPONSE TO STAFF'S SUPPLEMENTAL
DRAFT ENVIRONMENTAL IMPACT STATEMENT**

I. INTRODUCTION

Pursuant to 10 C.F.R. § 2.309, and Scheduling Order dated April 12, 2013, Intervenors Natural Resources Defense Council (NRDC) and Powder River Basin Resource Council (PRBRC) hereby move for the admission of updated and amended contentions regarding the Draft Supplemental Environmental Impact Statement (DSEIS) for Strata Energy's proposed Ross Project in-situ leach (ISL)¹ uranium mine issued by Nuclear Regulatory Commission Staff (NRC or the Staff) on March 21, 2013.

NRDC and PRBRC respectfully submit these updates to previously admitted contentions (*i.e.*, Contentions 1-A, 2-A, 3-A, and 4-A), and one new contention. The amended contentions simply assert that the DSEIS fails to address previously-identified inadequacies contained in the applicant's Environmental Report and that NRC Staff failed to adequately address those inadequacies in its DSEIS. The new contention concerns the failure to properly define the major federal action at issue in this DSEIS in light of the now concrete plans and schedule for Strata

¹ In situ leach (ISL) is also referred to as in situ recovery (ISR). For the purposes of this motion, the terms are used synonymously.

Energy's "Lance District Development," and therefore the failure to consider the full scope of the proposed uranium recovery and processing activities at issue.

While recognizing NRC regulations may not require NRDC and PRBRC to resubmit our contentions, we file these resubmitted contentions as all our objections that applied to the ER now apply to the DSEIS. We present them now out of an abundance of caution to preclude any subsequent assertion by the Staff, the Applicant or a reviewing tribunal that Petitioners have not pursued their rights as secured by the U.S. Constitution, the National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4323 *et seq.*, or regulations promulgated by the Council on Environmental Quality ("CEQ") or NRC. As to this category of contentions, Petitioners raise them at this juncture in order to preserve these issues for further litigation and to create a complete record. These contentions are denoted with an "A" (i.e., Contention 2-A supplements NRDC-PRBRC-2 with arguments under NEPA).

II. BACKGROUND

A. Procedural Background

On October 27, 2011 and pursuant to 10 C.F.R. § 2.309 and the Nuclear Regulatory Commission's (NRC, or Commission) Federal Register notice published at 76 Fed. Reg. 41,308 (July 13, 2011), Petitioners NRDC and PRBRC submitted a Petition to Intervene and Request for a Hearing in the above-captioned matter. To safeguard their and their members' environmental, aesthetic, health-based and economic interests, Petitioners articulated five contentions in their Petition. These contentions address various deficiencies in Strata Energy, Inc.'s (Strata) source materials license application for the proposed Ross In Situ Recovery (ISR) Uranium Project in Crook County, Wyoming.

Following briefing on standing and the admissibility of each contention, the Atomic Safety & Licensing Board (ASLB, or the Board) conducted a day-long hearing on these matters on December 20, 2011. On February 10, 2012, the Board issued LBP-12-3, “Memorandum and Order, Ruling on Standing and Contention Admissibility.” This 53-page opinion held that Petitioners had established standing² and admitted two of their five contentions in whole while admitting the remaining three in part. *See* LBP-12-3 at 1–2, 18–25, 28, 32, 36, 37, and 39–40. On February 21, both Strata and NRC Staff (or Appellants) filed appeals of LBP-12-3 and argued Joint Petitioners had not demonstrated standing to challenge Strata’s application for a license for an in situ uranium recovery project in Crook County, Wyoming. Strata also asked the Commission to eliminate two contentions from the proceeding, should it decline to reverse the Board’s standing determination. NRDC and PRBRC opposed both appeals. On May 11, 2012 the Commissioners issued CLI-12-12 and affirmed the Board’s standing determination and declined to consider Strata’s remaining claims. *See* CLI-12-12 at 1-2.

On March 21, 2013, Staff issued the Draft Supplemental Environmental Impact Statement for the Ross ISR Project (DSEIS). Comments on the DSEIS are due on May 13, 2013 and amended or new contentions on the DSEIS are due this day. *See* Order of Apr. 12, 2013.

B. Legal Standards

Consistent with provisions in 10 C.F.R. § 2.309(f)(2), a timely new or amended contention must be based on information that previously was unavailable, arise from information that is materially different from previous information, and be filed in a timely fashion. 10 C.F.R.

² NRDC’s and PRBRC’s standing was confirmed in this Board’s Order of February 2012 and the Commission’s Order of May 2012. *See* LBP-12-3, “Memorandum and Order, Ruling on Standing and Contention Admissibility” at 1–2, 18–25; and CLI-12-12. As such, pursuant to 10 C.F.R. § 2.309(c)(4), NRDC and PRBRC are not required to address standing in this filing.

§ 2.309(f)(2)(i)-(iii). In addition to Section 2.309(f)(2) or (c)(1)'s standards, a new or amended contention must also satisfy the general contention admissibility requirements of 10 C.F.R. § 2.309(f)(1).

NRC regulations dictate that contentions arising pursuant to the National Environmental Policy Act (NEPA) must initially be "based on the applicant's environmental report [ER]." 10 C.F.R. § 2.309(f)(2). If admitted, those contentions may be amended, or new contentions proffered, as long as "there are data or conclusions in the NRC draft or final environmental impact statement . . . or any supplements relating thereto, that differ significantly from the data or conclusions in the applicant's documents." *Id.* In the April 12, 2013 Order, the Board set a schedule that new or amended contentions that are properly based on significantly new data or conclusions in the DSEIS will be considered timely if filed on or before May 6, 2013. We file one new contention this day and update our existing, admitted contentions to apply to the Staff's DSEIS.

III. CONTENTIONS

Pursuant to 10 C.F.R. § 2.309, Petitioners offer updates to the previously admitted contentions. Each contention challenges the sufficiency of the DSEIS under NRC regulations, as specified therein, as well as its compliance with NEPA.

The law of admissibility for this proceeding is well established. "[I]n passing on the admissibility of a contention. . . 'it is not the function of a licensing board to reach the merits of [the] contention.'" *Sierra Club v. NRC.*, 862 F.2d 222, 226 (9th Cir. 1988) (quoting *Carolina Power and Light Co.*, 23 N.R.C. 525, 541 (1986)). Instead, the Board evaluates the admissibility of contentions in a manner similar to a federal court's review of claims in a well-pled complaint:

The relevant inquiry is whether the contention adequately notifies the other parties of the issues to be litigated; whether it improperly invokes the hearing process by raising non-justiciable issues, such as the propriety of statutory requirements or agency regulations; and whether it raises issues that are appropriate for litigation in the particular proceeding.

Sierra Club, 862 F.2d at 228 (citing *Tex. Utils. Elec. Co.*, 25 N.R.C. 912, 930 (1987) and *Phila. Elec. Co.*, 8 A.E.C. 13, 20–21 (1974)); *see also* LBP-12-3 at 25 and *Crow Butte Res.*, Nuclear Reg. Rep. P 31589, 2009 WL 1393858 at *11, 14 (May 18, 2009) (holding that the applicant’s “arguments go to the merits” and that “[w]hether the [petitioner] has proved its claim is not the issue at the contention pleading stage”).

Pursuant to 10 C.F.R. § 2.309(f)(2), Petitioners styled their original NEPA contentions as against the ER. *See id.* (“On issues arising under the National Environmental Policy Act, the petitioner shall file contentions based on the applicant’s environmental report.”). Because an applicant’s ER generally serves as the basis for the Commission’s eventual DSEIS, Petitioners raised NEPA considerations at that time in order to preserve any objections if flaws found in the ER also appear in the Draft SEIS. And in fact, those flaws have appeared in the DSEIS, and thus today we submit updates to our previously admitted contentions. In addition, the DSEIS reveals a new concern for which we submit a new Contention.

Environmental Contention 1-A: The DSEIS fails to adequately characterize baseline (*i.e.*, original or pre-mining) groundwater quality.

CONTENTION: The DSEIS fails to comply with 10 C.F.R. §§ 51.45, 51.70 and 71, 10 C.F.R. Part 40, Appendix A, and NEPA because it lacks an adequate description of the present baseline (*i.e.*, original or pre-mining) groundwater quality and fails to demonstrate that groundwater samples were collected in a scientifically defensible manner, using proper sampling

methodologies. The DSEIS's departure from NRC guidance serves as additional evidence of these regulatory violations. NRC, NUREG-1569, Standard Review Plan for In Situ Leach Uranium Extraction License Applications, §§ 2.7.1, 2.7.3, 2.7.4 (2003).³

A. Bases and Supporting Evidence and the Board's Admission of Contention 1

This contention is supported by the original declarations of Drs. Moran, Sass, and Abitz, particularly Moran Decl. at ¶¶ 36–56, Sass Decl. at ¶¶ 8–15, 22–23, and Abitz Decl. at ¶¶ 15–27. It is further supported by a second declaration from Dr. Abitz filed this day. *See* Second Declaration of Dr. Richard Abitz (“2d Abitz Decl.”), ¶¶ 6-23. The declarations explain both that baseline water quality data is necessary to properly evaluate environmental impacts in the SEIS, and that collecting this data later risks allowing the further deterioration of the baseline as a result of activities that may occur in the area in the meantime. *Id.*

Our Petition to Intervene explained the requirements that must be satisfied for the Applicant to adequately consider the environmental impacts associated with groundwater quality, and need not be repeated here. *See* Petition to Intervene at 10-12. However, based on those standards and the deficiencies in the ER the ASLB admitted Contention 1, explaining that the “question framed by this contention – whether NRC regulations and NEPA require a groundwater baseline characterization for an ISR site – is not new to NRC adjudications.” LBP-12-3 at 28. In particular, the Board explained that in the *Dewey-Burdock* proceeding the applicant had *similarly* asserted that it need not collect baseline water quality data prior to licensing, and that Board had rejected the argument. *Id.* at 28-29.

³ The resubmitted contention is the precise contention admitted by this board in LBP-12-3 on February 10, 2012. The only difference is resubmission with the regulatory cite of 10 CFR §§ 51.70 and 51.71 as they apply to the staff's NEPA responsibilities regarding the DSEIS.

Agreeing with that earlier Board, the ASLB admitted Contention 1, explaining that the applicant and Staff are “*incorrect* in their assertion that 10 C.F.R. § 40.32(e) prohibit[s] the applicant from gathering complete information on baseline water quality.” *Id.* at 28 (emphasis added). To the contrary, because the applicable regulations *permit* the collection of such data, and the data is plainly critical to a meaningful analysis of the environmental impacts associated with the project, the Board concluded that this Contention should be admitted. The effect of the Board’s conclusion was the admission of the contention and agreement that Joint Petitioners have framed an admissible contention that has a factual dispute, *i.e.*, the adequacy of the baseline water quality description in the ER and whether the applicant must take any additional steps to fulfill its legal responsibility under 10 C.F.R. § 51.45 to provide information in its ER outlining a description of the existing water quality baseline sufficient to enable the staff to prepare its own environmental impact statement. *Id.*

B. The DSEIS’s Failure to Resolve Contention 1, Necessitating Contention 1-A

Rather than take the necessary steps to resolve this critical gap in the environmental analysis for the project, in the DSEIS the Staff adopts the review of baseline water quality found in the ER, and adheres to the position previously rejected in this proceeding – *i.e.*, that the baseline water quality assessment can permissibly occur in great measure *after* Strata receives its license.⁴ Thus, the DSEIS states that although some minimal and wholly inadequate pre-

⁴ In its December 5, 2011 filing, NRC Staff averred that Criterion 5B(5)(a) requires no pre-license characterization of baseline water quality, but offered no support or citation for this claim. NRC Resp. at 16–17. The Staff further argued that NUREG-1569’s standards for baseline water quality assessments “are not requirements,” and that the “acceptability of programs proposed in applications are instead determined by NRC Staff on a case-by-case basis during the individual licensing review.” *Id.* at 17. In sum, both Strata and the Staff argued that the original authorities Petitioners properly cited—10 C.F.R. § 51.45, Criteria 5 and 7, and NUREG-1569—do not require the kind of technical adequacy or sufficiency of detail that Petitioners assert the

licensing baseline values will be collected,⁵ only *after* licensing will the necessary groundwater quality data be collected to determine “concentration-based levels that would permit identification of any excursions from the respective wellfields.” DSEIS at 2-24, line 14.⁶

Simply put, multiple authorities mandate that an application include an adequate assessment of baseline water quality prior to licensing. 10 C.F.R. § 40.32(e) requires a pre-license evaluation of “any appropriate conditions to protect environmental values,” which, in the case of ISL uranium mining, necessarily entails an analysis of existing water quality. Similarly, 10 C.F.R. § 51.45(b) and 71 requires a “description of the environmental effects of the proposed action;” and neither Staff nor Strata can plausibly claim that “the affected environment” does not encompass the groundwater in its current qualitative state. Criterion 5B(5)(a) of 10 C.F.R. Part 40, Appendix A specifies that “the concentration of a hazardous constituent must not exceed . . . [t]he Commission approved background concentration of that constituent in the ground water,” a determination that necessitates an initial, adequate characterization of baseline water quality. As

regulations require with regard to a baseline water quality assessment, Strata Resp. at 45–46, NRC Resp. at 17–19, and attacked the technical conclusions provided by Petitioners’ experts. Strata Resp. at 46–47; NRC Resp. at 19–21. The Board rejected these arguments. LBP 12-13, at 28-32.

⁵ Our original declarations explained why the baseline data collected for the ER is inadequate. See Moran Decl. at ¶¶ 36–56, Sass Decl. at ¶¶ 8–15, 22–23, and Abitz Decl. at ¶¶ 15–27. As explained in our Supplemental Declaration those deficiencies have not been remedied in the DSEIS. 2d Abitz Decl. ¶¶ 6-23.

⁶ See also, “Later, prior to actual uranium-recovery wellfield operation, but *after the initial NRC license* is issued for wellfield construction, the ground water in each wellfield would be analyzed for the post-licensing, pre-operational baseline concentrations of constituents specified by the NRC (NRC, 2003a). DSEIS, at 2-24, line 41 (emphasis added); *accord id.* at 6-8, line 7 (“The Applicant proposes a ground-water monitoring program to acquire post-licensing, pre-operational data in order to establish the parameters necessary to detect excursions outside the ore zone during active uranium-recovery operation and to observe aquifer-restoration performance as it proceeds”).

the *Dewey-Burdock* opinion explains, Criterion 7 of Appendix A requires an applicant to provide “complete baseline data on a milling site and its environs.” *Dewey-Burdock*, Docket No. 40-9075-MLA at 64. Finally, NUREG-1569 discusses in several sections the need for “reasonably comprehensive” data shown to have been “collected by acceptable sampling procedures.” NUREG-1569 §§ 2.7.3; *accord id.* at §§ 2.7.3, 2.7.4; *see also* 2d Abitz Decl. ¶¶ 6-23.

General NEPA principles also dictate that baseline water quality data be collected *before* NRC makes a final decision on the license, not afterwards, as currently planned. Indeed, the CEQ regulations implementing NEPA’s mandates require that where there is information that “is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, *the agency shall include the information in the environmental impact statement.*” 40 C.F.R. § 1502.22(a) (emphasis added). Thus, as reviewing courts have explained, “an agency is required to engage in reasonable research *to supply missing information* about negative impacts that a project may produce.” *Ocean Mammal Inst. v. Cohen*, No. 98-CV-160, 1998 WL 2017631, at *5 (D. Haw. Mar. 9, 1998) (emphasis added); *see also id.* (federal agencies “have an affirmative duty under NEPA and its implementing regulations to undertake research in order to prepare a comprehensive EIS that federal government officials can use to make a reasoned decision”); *State of Idaho By and Through Idaho Pub. Util. Commn v. ICC*, 35 F.3d 585, 596 (D.C. Cir. 1994) (promise to address potential impacts in the future is “no substitute for an overarching examination of environmental problems at the time the [original] decision is made”).

Thus, Contention 1A, the same Contention as admitted Contention 1 but directed against the DSEIS, meets the legal standards described in 10 C.F.R. § 2.309(f)(1). The Board should affirm this updated contention so that Petitioners may argue the merits of their claim that DSEIS lacks an adequate description of the present baseline for groundwater quality.

Environmental Contention 2-A: The DSEIS fails to analyze the environmental impacts that will occur if the applicant cannot restore groundwater to primary or secondary limits.

CONTENTION: The DSEIS fails to meet the requirements of 10 C.F.R. §§ 51.45, 51.70, 51.71 and NEPA because it fails to evaluate the virtual certainty that the applicant will be unable to restore groundwater to primary or secondary limits.⁷

A. Bases and Supporting Evidence, And The Board’s Admission of Contention 2.

This admitted contention is supported by the original declarations of Drs. Moran and Abitz, particularly Moran Decl. at ¶¶ 66–67, 70–75 and Abitz Decl. at ¶¶ 28–29.

It is further supported by a second declaration from Dr. Abitz filed this day. 2d Abitz Decl. ¶¶ 24-29. The declarations explain that the applicant and NRC staff have neither substantiated their claim that impacts on groundwater quality will ultimately be small, nor have they provided analysis that demonstrates how they arrive at or even quantify such a determination (*see, e.g.*, DSEIS at 4-37, “[t]he potential impacts of the operation of the Proposed Action to ground-water quality in the confined aquifers above and below the ore zone would, therefore, be SMALL.”))

Our Petition to Intervene explained the legal requirements that must be satisfied for the applicant to adequately address this water quality restoration issue, and need not be repeated here. *See* Petition to Intervene at 16-18. The Board admitted Contention 2, finding that NEPA and NRC implementing regulations require an analysis of “irreversible and irretrievable commitments of resources which would be involved in the proposed action.” LBP-12-3 at 33 (internal quotation omitted). In the context of ISR uranium mining, NEPA regulations

⁷ The resubmitted contention is the precise contention admitted by this board in LBP-12-3 on February 10, 2012. The only difference is resubmission with the regulatory cites of 10 CFR §§ 51.70 and 51.71 as they apply to the staff’s NEPA responsibilities regarding the DSEIS.

necessarily implicate groundwater; thus, the Board rightly observed that “unless the baseline can be restored, there will be an ‘irreversible and irretrievable’ commitment of a resource the parameters of which must, under NEPA and agency regulations, be outlined in the applicant’s ER.” *Id.* Grappling with the implications of Contention 2, the Board reasoned that any environmental analysis of the impacts resulting from an “alternative concentration limit” (ACL) would necessitate

... some determination about what that ACL would be. But, as SEI and the staff assert, given the differences that exist among well fields, it likely cannot be known at this juncture exactly what alternative concentration will be deemed necessary to protect human health and the environment under the nineteen factors of Appendix A, Criterion 5B(6). Joint Petitioners, on the other hand, suggest that the magnitude of the endeavor could be narrowed to a range of possible ACLs based on the historical experience of other ISL/ISR sites. What this essentially calls for is a bounding analysis, something that is not unheard of in the context of NEPA analyses and does not seem untoward in this instance, given the importance of NEPA as a mechanism for providing information regarding the parameters of “irreversible and irretrievable” resource commitments. As such, we do not consider this concern a reason for precluding this contention’s admission.

Id. at 34 (citations omitted). Finally, cognizant of the fact that at some distant future date Petitioners might have an opportunity to challenge the sufficiency of a specific, proposed ACL, the Board found “the ability of any interested person to obtain an AEA hearing at that point would not provide the relief Joint Petitioners *should be able to obtain now*, consistent with NEPA, *i.e.*, a public explanation of the impacts of being unable to restore the mined aquifer to primary or secondary baseline and, instead, having to use an ACL, as that alternate limitation might be implemented per a reasonable bounding analysis.” *Id.* at 35 (emphasis added).

B. The DSEIS’s Failure to Resolve Contention 2, Necessitating Contention 2-A

The DSEIS does not substantially differ from the ER in its treatment of the underlying matters in Contention 2. The restoration process, which relies heavily on the generic analysis of

restoration processes described in the Generic EIS, is described in the DSEIS at 2.1.1.3. The affected environment is described in a manner similar to that in the ER in the DSEIS at 3.5.3 and 3.12.1.

In contrast to this, Drs. Moran and Abitz both provided specific historical and technical evidence demonstrating why Strata is unlikely to achieve primary (baseline water quality) or secondary (EPA-issued safe drinking water levels) restoration standards during decommissioning. *See* Moran Decl. at ¶¶ 66–67, 70–75; Abitz Decl. at ¶¶ 28–29; *see also* 2d Abitz. Decl. ¶¶ 24–29. Neither Strata nor the NRC Staff have provided any evidence suggesting that the Ross Project will not cause significant aquifer degradation, even if Strata complies with an NRC-provided ACL. In short, the starting and finishing lines for measuring the degradation of water quality as a result of the project are not disclosed.⁸

Contention 2A meets the legal standards described in 10 C.F.R. § 2.309(f)(1). The Board should affirm this updated contention so that Petitioners may argue the merits of their claim that Strata’s ER and Staff’s DSEIS require a bounding analysis and explanation of the environmental impacts that result from the eventual adoption of an ACL rather than primary or secondary groundwater standards.

⁸ In reality, ISL mining operations have yet to achieve either primary or secondary groundwater restoration standards, but have thus far always required the Commission (or the relevant Agreement State) to establish an alternative (that is, more lenient) restoration standard. As Petitioners’ experts attest, all the available information indicates that the operators of the proposed Strata ISL mining facility will be no more likely to achieve primary or secondary groundwater restoration standards during decommissioning than any of their predecessors, unless the bar is set very low, by employing “pre-operational” Target Restoration Values that are established post-licensing, postdrilling, and post-casing and pressure-testing of each individual wellfield or possibly even each individual “wellfield module” – the DSEIS is unclear on this point.

Environmental Contention 3-A: The DSEIS fails to include adequate hydrological information to demonstrate SEI's ability to contain groundwater fluid migration.

CONTENTION: The DSEIS fails to assess the likelihood and impacts of fluid migration to the adjacent groundwater, as required by 10 C.F.R. §§ 51.45, 51.70, 51.71 and NEPA, and as discussed in NUREG-1569 § 2.7.⁹

A. Bases and Supporting Evidence, and the Board's Admission of Contention 3

This admitted contention is supported by the original declarations of Drs. Moran, Sass, and Abitz, particularly Moran Decl. at ¶¶ 14-31; Sass Decl. ¶¶ 8-15 and 24-26, and Abitz Decl. at ¶¶ 7-15. It is further supported by a second declaration from Dr. Abitz filed this day. 2d Abitz Decl. ¶¶ 30-37. The declarations explain the bases for the Contention that the applicant and NRC staff have failed to demonstrate that Strata can contain fluid migration that may pollute the environment as a result of the project.

Our Petition to Intervene explained the legal requirements that must be satisfied for the applicant to adequately address this fluid migration issue, and need not be repeated here. *See* Petition to Intervene at 19-20. The Board admitted Contention 3, explaining that “[t]he declarations of Drs. Moran, Sass, and Abitz contain detailed discussions regarding boreholes and aquifer isolation in the immediate vicinity of the Ross facility that raise questions about the groundwater hydrology associated with the site as detailed in the SEI application sufficient to establish a material issue of fact.” LBP-12-3 at 36.

⁹ The resubmitted contention is the precise contention admitted by this board in LBP-12-3 on February 10, 2012. The only difference is resubmission with the regulatory cites of 10 CFR §§ 51.70 and 51.71 as they apply to the staff's NEPA responsibilities regarding the DSEIS.

B. The DSEIS's Failure to Resolve Contention 3, Necessitating Contention 3-A

The DSEIS does not resolve the concern regarding the risk of fluid migration. The DSEIS reveals that the testing done to insure protection against fluid migration *failed* – in fully one-third of the tests conducted, “pumping of the OZ aquifer showed a possible response in the DM aquifer.” DSEIS at 4-35, lines 40-41. Moreover, the Applicant claimed that this failure was due to “improperly plugged previous exploration drillholes that have not yet been properly abandoned.” *Id.* at lines 42-43.

This is one of the precise concerns raised in the admitted Contention – the risks of fluid migration due to the thousands of drillholes in the area. *See* Pet. to Intervene at 21-22. The information in the DSEIS only serves to heighten that concern, for several reasons. First, while the applicant earlier estimated there were approximately 5,000 of these holes, *see* Moran Decl. ¶ 22, the DSEIS lowers that number to less than 2,000, without explanation as to why more than 3,000 holes apparently are of no concern. Second, while the DSEIS states that the applicant will properly plug *all* these holes, there is no information provided to demonstrate either that the applicant will be able to identify all the holes, or that it will be able to fill them in a manner that insures they do not continue to contribute to fluid migration. 2d Abitz Decl. ¶¶ 30-37.

Moreover, the DSEIS also does not address Petitioners' more fundamental concern that irrespective of these holes, the hydrological connections between the aquifers in the area pose a serious risk of fluid migration. Indeed, while the applicant claims that the failed fluid migration tests are due to exploratory wells that will be plugged, the DSEIS contains no information demonstrating that the failure was not due to the hydrological connectivity that exists irrespective of these wells. *Cf. Center for Biological Diversity v. BLM*, 698 F.3d 1101 (9th Cir.

2012) (rejecting agency’s refusal to consider the hydrological connectivity between groundwater and surface water).

The DSEIS attempts to address this concern by asserting that the Applicant will be required to “install a ring of monitoring wells around each wellfield” to “allow monitoring of the SM and DM aquifers as well as the OZ aquifer around their perimeters.” DSEIS at 4-36, lines 15-18. However, as with the groundwater quality issue more generally, *see supra* at 7-10, the agency cannot avoid studying vital environmental concerns related to a project by promising to collect data on the matter *later*. *Id* (citing *State of Idaho*, 35 F.3d at 596 (promise to address potential impacts in the future is “no substitute for an overarching examination of environmental problems at the time the [original] decision is made”). Rather, the data must be collected and included in the DEIS to inform the decision to be made.

Contention 3A meets the legal standards described in 10 C.F.R. § 2.309(f)(1). The Board should affirm this updated contention so that Petitioners may argue the merits of their claim that Strata’s ER and Staff’s DSEIS fails to adequately address the risks of fluid migration.

Environmental Contention 4/5A-A: The DSEIS fails to adequately assess cumulative impacts of the proposed action and the planned Lance District expansion project.

CONTENTION: The DSEIS violates 10 C.F.R. § 51.45, 51.70, 51.71 and NEPA, and the Council on Environmental Quality’s (CEQ) implementing regulations for NEPA because it fails to consider adequately cumulative impacts, including impacts on water quantity, that may result

from the proposed ISL uranium mining operations planned in the Lance District expansion project.¹⁰

A. Bases and Supporting Evidence, and the Board's Admission of Contention 4/5A.

This admitted contention is supported by the original declaration of Dr. Moran, particularly ¶¶ 7-8, 59-63, 69, 76-78, 96-98. It is further supported by a second declaration from Dr. Abitz filed this day 2d Abitz Decl. ¶¶ 38-43, and by the Declaration of Christopher E. Paine, filed this day as well. The declarations explain the bases for the Contention that the applicant and NRC staff have failed to consider the cumulative effects on the environment, including on groundwater quantity, associated with the full scope of ISL uranium mining anticipated to occur in the foreseeable future in the Lance District.

Our Petition to Intervene explained the legal requirements associated with considering cumulative effects and need not be repeated here. *See* Petition to Intervene at 25, 27-28. The Staff agreed that Petitioners had submitted an admissible contention regarding cumulative impacts associated with groundwater quantity, LBP-12-3 at 38, and the Board admitted that aspect of this Contention, citing the “specific criticisms of SEI’s water use and restoration analysis” in the ER, *id.* at 37, which “presents a material dispute with SEI’s application that is within the scope of this license proceeding.” *Id.* at 38; *see also id.* at 43.

As for other cumulative impacts, the Board also admitted that portion of the original Contention 5 that raised cumulative impacts more generally, rejecting the applicant and Staff’s argument that cumulative impacts need not be considered. *Id.* at 40. In particular, the Board

¹⁰ The resubmitted contention is the precise contention admitted by this board in LBP-12-3 on February 10, 2012. The only difference is resubmission with the regulatory cite of 10 CFR §§ 51.70 and 51.71 as it applies to the staff’s NEPA responsibilities regarding the DSEIS.

admitted that portion of this Contention concerning the planned expansion of SEI's Lance District ISL program, noting that the ER indicates that "additional facilities would likely operate as satellites of the Ross facility and would utilize the same CCP that SEI proposes to construct for the Ross project." *Id.* at 42. As for the applicant's statement that the expansion poses no greater impacts because the "impacts will be distributed proportionately throughout the region of influence," *id.* at 42, even the Staff – as well as the Board – agreed that the contention was admissible "with regard to the lack of specificity about SEI's planned satellite facilities, and the potential impact resulting from the Ross facility's CPP being used for SEI's additional facilities and possible use of third parties." *Id.* The Board similarly admitted the Contention as to cumulative effects of groundwater quality. *Id.* at 43; *See also* 40 C.F.R. § 1502.22(a) ("If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement."); *see also*, 10 C.F.R. 51.71(d) ("The analysis for all draft environmental impact statements will, to the fullest extent practicable, quantify the various factors considered.").

B. The DSEIS's Failure to Resolve Contention 4/5A, Necessitating Contention 4/5A-

The DEIS does not adequately address cumulative impacts. Although the existence of a broader ISR program is recognized, DSEIS at 5-1-3-50, the impacts of this larger program are not analyzed in a manner that allows a consideration of the on-the-ground impacts associated with various impacted aspects of the environment.

For example, with respect to groundwater quantity – an issue the cumulative effects of which the Board has already admitted into this proceeding – the DSEIS contains *one paragraph* summarily stating that the cumulative impacts will be "SMALL," and that any such effects will

be “essentially restored within 24 years after the issuance of the NRC license to the Applicant.” *Id.* at 5-25, line 31. However, there is no meaningful quantitative analysis of the projected cumulative consumptive uses of groundwater from uranium mining and other resources extraction activities that draw on the Lance and Fox Hills aquifers, and no *explanation* provided of how restoration will occur, or what it means to characterize the impacts as “small.” 2d Abitz Decl. ¶¶ 38-43.

This is inadequate. An agency may not rely on “conclusory or unsupported suppositions,” *McDonnell Douglas Corp. v. U.S. Dep’t of the Air Force*, 375 F.3d 1182, 1186-87 (D.C. Cir. 2004), and it is insufficient to simply *assert* that an effect will be resolved at some point in the future. Moreover, courts have frequently rejected agency’s use of conclusory labels like “small” and “moderate” to characterize impacts, where the agency does not explain the basis for these labels. *E.g. Greater Yellowstone Coal. v. Kempthorne*, 577 F. Supp. 2d 183, 201 (D.D.C. 2008); *Sierra Club. v. Mainella*, 459 F. Supp. 2d 76, 100-01 (D.D.C. 2006).

The cumulative impacts analysis associated with groundwater quality is similarly lacking. DSEIS at 5-25 to 5-26. For this and other impact areas, the cumulative impacts analysis, like the ER, fails to consider the cumulative impacts associated with the more extensive “Lance District Development” that the DSEIS acknowledges is “scheduled” for the area (*Id.* Figure 2.6 at 2-8 and t 5-3 to 5-5.) surrounding the “Ross Project.” Thus, while the DSEIS recognizes there are “four satellite areas within the Lance District that the NRC staff identifies as reasonably foreseeable,” *id.* at 5-3-5, as in the ER the DSEIS fails to consider the cumulative impacts associated with this much larger project. *See* Declaration of Christopher Paine (“Paine Decl.”) ¶¶ 23-56.

New Environmental Contention Number 6: NRC has failed to properly define the scope of the proposed major federal action here, which encompasses a much larger project in the same

geographic area, as revealed in the DSEIS and in documents drafted by Strata's Australian parent company, Peninsula Energy, Ltd.

CONTENTION: The DSEIS violates 10 C.F.R. §§ 51.70 and 71, NEPA, and the Council on Environmental Quality's (CEQ) implementing regulations for NEPA because it fails to consider the environmental impacts of, and appropriate alternatives to, the applicant's actual proposed project, and instead improperly segments the project by framing the Proposed Action under review as only a small part of the Applicant's planned and scheduled In Situ Recovery (ISR) activities in the Lance District.

Basis and Discussion:

NEPA requires that "[p]roposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated *in a single impact statement.*" 40 C.F.R. §1502.4(a). Proposals meet the standard for a single course of action where they "have similarities that provide a basis for evaluating their environmental consequences together, *such as common timing or geography.*" 40 C.F.R. §1508.25(a) (emphasis added). Thus, as the Supreme Court has explained, "when several proposals for . . . actions that will have a cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together" in a single NEPA document. *Kleppe v. Sierra Club*, 427 U.S. 390, 406 (1976).

Here, as has now become evident via a recent review of documents from the Applicant's Australian corporate parent (Peninsula Energy), the "proposed action" over which NRC is conducting this NEPA review is simply one part of a much larger project in the same geographic area. See Declaration of Christopher Paine ("Paine Decl.") ¶¶ 23-53. Accordingly, the applicant must prepare an ER, and NEPA review must be completed, on the *entire project*.

In particular, as detailed in the Paine Declaration, in preparing comments on the DSEIS over the past several weeks, Petitioners discovered a series of public statements by Peninsula Energy which reveal the actual scope of the project to be much larger than the scope considered in the DSEIS (and the ER). *Id.* ¶ 23. In these documents Peninsula Energy has repeatedly stated that, contrary to what is analyzed in the ER and DSEIS, it will develop the entire “Lance Project,” not just the sub-component called the “Ross Project.” *Id.* ¶¶ 23-53.

The declaration summarizes a large number of those documents, but to highlight just a few here, as recently as March, 2013, Peninsula Energy explained that it will develop “the Ross, Kendrick and Barber Production Units feeding a Central Processing Plant with a capacity of 750klbs per annum with the sequential inclusion of the Kendrick and Barber Production Units ramping up over several years to 2.2mlbs per annum steady-state production.” Paine Decl. ¶ 34 (*citing* <http://www.pel.net.au/images/peninsul---singaeferhu.pdf>). Indeed, the document makes it clear that the *reason* the applicant has proposed something considerably smaller than its entire proposed project is precisely to avoid a full and complete analysis of the environmental impacts associated with the project as a whole. Thus, the company states:

All new project area permitting is designed so they are contiguous with the Ross permit area and are deemed amendments to the Ross SML (once issued) rather than standalone applications. *This strategy will significantly reduce the permitting process and timing.*

Id. at 4 (emphasis added). In other words, the company is telling the public, and its shareholders, that *the whole project will be developed*, while it is only analyzing a small portion in the DSEIS. Indeed, the Central Processing Plant (CPP) to be developed under the “Ross Project” may not even constitute an economically viable investment without the revenue assumptions based on exploiting these additional “production units.”

This most recent announcement is consistent with a host of statements by Peninsula Energy referring to the development of the much broader “Lance Project.” *Id.* ¶¶ 23-53; *see also, e.g., id.* ¶ 35 (discussing production “assumed to be permitted for development at Kendrick and Barber and to follow Ross into production at 12 month intervals feeding the CPP”); *id.* ¶ 23 (“the proposed Ross ISR site . . . forms a *part of the total project area* . . .”) (emphasis added).

The DSEIS similarly acknowledges this explicit and broader scope, including:

- * the “Ross Amendment,” whereby the project is to be expanded to the north and west to increase the operating life of the project by supplying additional yellowcake. DSEIS at 5-3 (“As uranium production from early wellfields within the Ross Project area begins to diminish . . . additional wellfields in the Ross Amendment Area could be brought into production”);
- * the “Kendrick Satellite Area,” which will be contiguous with the Ross Project, and by operating simultaneously will “allow the Applicant to increase its production of yellowcake to approximately 680,000 kg/yr.” *Id.*;
- * the “Richards Satellite Area,” which is contiguous to the Kendrick area, will have “uranium-rich solutions . . . piped to the Rodd Projects’ CPP for uranium recovery.” *Id.* at 5-5; and
- * the “remote IX-only plant” at the “Berber satellite area,” whereby “the pregnant, uranium-rich solutions brought to the surface at the Berber satellite area would be treated by IX to yield uranium-loaded resins, which would then be trucked to the Ross Project’s CPP for further processing.” *Id.*

In light of the actual scope of the project, the applicant must prepare an ER – and then a DSEIS must be prepared – that considers the *entire* major federal action at issue. *E.g. Fund for Animals v. Clark*, 27 F. Supp. 2d 8, 13 (D.D.C. 1998) (“[i]f agency actions are similar in that they share common timing or geography, such actions should also be addressed in the *same environmental document* so as to assess adequately their combined impacts”) (emphasis added).

That review must consider the environmental impacts of the entire project. It must also consider reasonable alternatives to that entire project – including, *e.g.*, alternatives whereby something *less* than the entire proposed Lance District ISL mining would occur.¹¹

By failing to consider the overall project, the applicant and NRC are unlawfully segmenting the project into smaller parts. *E.g. Thomas v. Peterson*, 753 F.2d 754, 758 (9th Cir. 1985) (“close interdependence” between two aspects of a project warrant review in a single EIS); *Florida Wildlife v. U.S. Army Corps of Engrs.*, 401 F. Supp. 2d 1298, 1318 (S.D. Fla. 2005) (first phase of a project “that was never intended to stand alone” may not be artificially segmented from the larger project that is “conceptualized as an integrated whole, progressing in phases”). Accordingly, the Board should admit this new Contention that the Staff and Applicant have unlawfully segmented this project, and must consider preparing an ER – and then a DSEIS – that considers the *entire* major federal action it intends to undertake in this area.

The Contention Complies With 10 C.F.R. § 2.309

Contention No. 6 complies with 10 C.F.R. § 2.309, which requires Petitioners submitting a new contention to demonstrate that: (a) the information on “which the filing is based was not previously available,” (b) the new information is “materially different from the information previously available,” and (3) the filing is timely submitted based on “the availability of the subsequent information.” 10 C.F.R. § 2.309(c).

¹¹ The alternatives analysis that will be required for the entire project distinguishes Contention 6 from Contention 4/5A-A concerning cumulative impacts. Thus, even assuming *arguendo* that the full scope of the environmental impacts associated with the entire project can properly be considered as part of a cumulative impacts analysis, restricting the scope of the proposed project would constrain the scope of alternatives to exclude, *inter alia*, developing something less than the entire project.

Here, the applicant and NRC Staff have presented the much smaller Ross Project as the proposed action. It was not until reviewing Peninsula Energy materials, and the DSEIS, in recent weeks that Petitioners came to appreciate that the connection between the Ross Project and the applicant's much broader plans for ISL mining in this same geographic area is sufficiently close to warrant consideration in a single EIS. Paine Decl. ¶¶ 22-56; *see also id.* ¶¶ 4-12 (discussing the smaller scope of the project at issue in this proceeding). Thus, since Contention No. 6 is based on materially different information that was not previously available, the Contention is timely.

CONCLUSION

For the foregoing reasons, the Petitioners have demonstrated that their updated contentions and new contention are admissible, and they are entitled to a hearing on these contentions.

Respectfully submitted,

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Date: May 6, 2013

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing *Joint Motion To Resubmit Contentions & Admit One New Contention In Response To Staff's Supplemental Draft Environmental Impact Statement* and accompanying attachments in the above-captioned proceeding were served via the Electronic Information Exchange (EIE) on the 6th day of May 2013, which to the best of my knowledge resulted in transmittal of same to those on the EIE Service List for the captioned proceeding.

Shannon Anderson (electronic signature)

Date: May 6, 2013

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
STRATA ENERGY, INC.,) Docket No. 40-9091-MLA
)
(Ross In Situ Recovery Uranium Project))

**SECOND DECLARATION OF DR. RICHARD ABITZ ON BEHALF
OF THE NATURAL RESOURCES DEFENSE COUNCIL &
POWDER RIVER BASIN RESOURCE COUNCIL**

I. INTRODUCTION

I, Dr. Richard Abitz, declare that the following statements are true and correct to the best of my knowledge.

1. I previously submitted a declaration in support of Petitioners' motion to intervene and contentions in this proceeding, and that declaration explains my background and experience relevant to this proceeding. *See* Oct. 23, 2011 Declaration of Dr. Richard Abitz ¶¶ 1-3.
2. The Natural Resources Defense Council has contracted my services to supply technical analysis and comments on both Strata the Energy's Ross Project In Situ Uranium Recovery¹ License Application before the Nuclear Regulatory Commission (NRC) and on the NRC's Draft Supplemental Environmental Impact Statement (DSEIS) for the Ross Project.
3. My expert opinions and comments in this declaration are based both on my professional experience and on my review of relevant portions of the NRC's DSEIS, Strata's application, and other documents listed in the References Cited section of this declaration.

¹ *In situ* recovery ("ISR") is also commonly referred to as *in situ* leaching ("ISL"). For the purposes of this declaration, the two phrases are used interchangeably.

4. My declaration focuses on the technical issues at the foundation of each of Petitioners' admitted contentions in this proceeding. I begin with the overarching observation that in terms of technical presentation and analysis, there are few differences between Strata's ER and the Staff's DSEIS with respect to the Petitioners' admitted contentions. And what few differences exist are not substantial and do not in any way alter the nature of the dispute between the parties as they relate to the admitted contentions pertaining to baseline water quality, analysis of the environmental impacts of alternative concentration limits, fluid migration, or cumulative impacts.
5. Included in my initial assessment of the lack of substantive difference in the two documents is a review of Strata's Responses to NRC Staff's Requests for Additional Information submitted since the admission of the four contentions and reference to the Declarations submitted by Drs. Moran and Sass.

Contention 1 – Baseline Water Quality

6. An element of the first contention addressed the lack of pre-industrial (pre-Nubeth) baseline water quality. *See* Moran Decl. ¶¶ 36-41, at 12 of NRDC's and PRBRC's Petition to Intervene (hereinafter "Petition"); Sass Decl. ¶¶ 22-23, Petition at 14. The DSEIS first states that "in the case of the Ross Project, because an earlier uranium-recovery operation was conducted within the Ross Project area, this operation could potentially have impacted 'background values.'" DSEIS at 2-24. But later the DSEIS claims: "[t]he similarity between the pre-licensing baseline concentrations in the ore zone and aquifer above the ore zone suggests that Nubeth did *not* alter the baseline water quality." DSEIS at 3-42 (emphasis added).
7. First, and most importantly, there are no 'background' values from Nubeth (1978) or Strata (2010). Background values can only be determined if statistically valid, random groundwater

samples are collected from wells that are constructed and developed without the addition of oxidizing fluids and air. This was not done by Nubeth or Strata. Second, Buswell (1982, p.25) notes that in 1976 Nubeth initiated a single-well, push-pull study (i.e., the injection and extraction of lixiviant from a single well), nearly two years *before* the first baseline samples were collected in April 1978 (Nubeth 1978). Therefore, the ore was injected with lixiviant *before* baseline water-quality samples were collected and pre-mining baseline does not exist for the Nubeth pilot-scale study.

8. The DSEIS's lack of analysis on the pre-industrial baseline water quality issue is similar to the lack of analysis on this issue in Strata's application and ER. The DSEIS simply presents a range of values for water quality, and no discussion on how baseline will be developed from these measurements, or data obtained from other wells, until *after* the license has been issued. Thus, Petitioners' fundamental concern with the pre-industrial baseline water quality aspect of the analysis remains. Specifically, in Section 3.5.3, "Ground-Water Quality," the DSEIS references Strata (2011a, 2012a) and Nuclear Dynamics (1978) for average concentrations of the major ions (Table 3.6), and for ranges for the trace ions and radionuclides (Table 3-7), for the six monitor-well clusters (SA, SM, OZ, and DM horizons) and for the Nuclear Dynamics data for the Nubeth Pilot Project. The NRC does not present the 2011 water-quality data but notes that "The data from 2011 are generally consistent with the 2009 and 2010 data, indicating a representative characterization of ground-water quality." (DEIS at p.3-39, lines 11-12). In my expert opinion, this statement is likely in error. Water quality results could not be located for the 2011 quarterly data from the Strata six regional wells (Strata 2012a) in a publicly accessible location. The Strata 2012b reference cited in the DSEIS (p. 3-118) was also searched, and 2011 quarterly water-quality data were not found. The NRC staff requested an

update to all monitoring data (ER RAI EM-1; Strata 2012b), but the Strata response indicates that the request for additional data beyond the 12 months of pre-license monitoring (i.e., 2010) is not a requirement of 10 CFR Part 40, and they questioned why this additional data request is necessary for NRC staff's review. It is my finding that the NRC should not, without the public having an opportunity to review, state that the 2011 data are consistent with 2009 and 2010.

9. Additionally, it is my finding that water quality data are not presented for all of the existing monitoring wells. The DSEIS states 51 pre-licensing ground-water monitoring wells are present as of the end of August 2011 (DEIS, p. 4-23, lines 15-18). The data presented in the DSEIS pertains only to six regional cluster wells each containing four monitoring wells (24 wells), which leaves a balance of 27 monitoring wells for which water-quality data are absent. In my expert opinion, the absence of data from more than half of the ground-water monitoring wells must be explained, and analyzing the missing half of the ground-water monitoring data could plausibly alter expert conclusions on the interpretation of the entire set of measurements.
10. Remarkably, with no presentation of the new water-quality data, the DSEIS concludes there is a small impact on the groundwater resources even though: (1) these are not the data that will set baseline water quality (as such a standard will not be known until after licensing) and, in any event, (2) there is no discussion of the following water-quality issues, which would have to be addressed to ensure that the proper scientific and statistical methods are utilized to establish valid baseline values:
 - The impact of the use of oxidizing fluids during drilling operations, and the impact of air-lifting during well development - processes which can cause uranium ore to be oxidized during the drilling and development of monitoring wells and therefore alter true baseline water quality values (Abitz, 2010; Laaksoharju et al., 2008);

- Inclusion of a statistically sufficient number of randomly located wells to collect representative groundwater samples from the proposed aquifer exemption zone (VSP 2013);
- Assurance that baseline wells are screened through the entire sand interval of the aquifer horizon, in order to eliminate a high bias towards ground-water contamination when the sample is obtained only from the ore-rich interval of the aquifer horizon;
- Inclusion of proper statistical analysis and methods to establish valid baseline values (Gilbert, 1987; Matzke et al., 2007; ASTM, 1998; EPA, 1989; 1992a; 1992b; 2009; NRC, 2003);
- Inclusion of the explanation for the anomalous results that the Nubeth average values in Tables 3-6 and 3-7 of the DSEIS exceed the Nubeth high baseline values as given in Addendum 1.2-A in the Strata TR (note that by mathematical definition it is not possible for an average value to exceed a maximum value).

11. Although page 2-24 of the DSEIS (lines 15-44) notes that post-licensing/pre-operational baseline values and excursion upper-control limits (UCLs) would be established for each separate well field, there is no indication in the DSEIS as to how the NRC will ensure that Strata collects representative samples prior to mining (as noted in the above list), and then applies proper statistical methods to establish the pre-mining baseline and excursion UCL values. Moreover, the DSEIS does not present the scientific basis to support sequential establishment of baseline water quality and excursion UCLs in new well fields after mining has taken place in adjacent well fields. It is my finding that if NRC allows Strata to proceed in this fashion these actions would be inconsistent with accepted scientific methodology for definition of pre-mining baseline water quality.

12. While specific terminology used in the DSEIS to describe the Applicant process for establishing baseline water quality has changed somewhat from the ER, the issues raised in Petitioners contentions (concerning the ER's failure to document the establishment of a scientifically valid baseline for groundwater quality and assess a full range of plausible environmental outcomes from the proposed "aquifer restoration" process) remain unaddressed.
13. The DSEIS states (at 2-24, line 14): "Prior to commencing ISR operations, these [monitoring] wells [around the perimeter of each wellfield] would allow sampling and analysis of ground water and, in this DSEIS, this type of monitoring is called 'post-licensing, pre-operational.' The resulting post-licensing, pre-operational data would be used to determine concentration-based baseline levels and upper control limits (UCLs) that would permit identification of any excursions from the respective wellfields. These post-licensing, pre-operational baseline values would be established for each separate wellfield (and they would be codified in the Applicant's license)." In my expert opinion, these "post-licensing, pre-operational baseline values" have not been clearly stated to be the functional equivalent of the "Target Restoration Values" (TRVs) referenced in the ER at 6 -11 as "defin[ing] the aquifer restoration goals." (ER at 6-10). Too little information is provided about either to make this assessment.
14. The DSEIS also states (at 2-24, line 41): "Later, prior to actual uranium-recovery wellfield operation, but after the initial NRC license is issued for wellfield construction, the ground water in each wellfield would be analyzed for the post-licensing, pre-operational baseline concentrations of constituents specified by the NRC (NRC, 2003a), and (at 2-32, line 18): "The purpose of aquifer restoration is to restore the respective aquifer to its baseline conditions, as defined by post-licensing, pre-operational constituent concentrations...so as to ensure public health and safety."

15. From these descriptions in the DSEIS, it apparently remains the case that monitoring to determine baseline values (i.e., TRVs), and excursion UCLs to guide individual wellfield aquifer restoration efforts, would be undertaken only when a given wellfield's construction and testing is complete and a perimeter ring of monitoring wells has been established around the wellfield. In my expert judgment this scenario raises a consistent set of concerns that Petitioners lodged against the ER. The DSEIS offers no valid scientific or technical rationale for using "post-licensing, pre-operational," rather than "pre-licensing baseline" measurements, to establish "baseline" water quality data.
16. Moreover, if these excursion UCLs and post-licensing baseline concentrations are to be established "prior to commencing ISL operations....for each separate wellfield" as described on page 2-24 of the DSEIS, and there are "15-25 wellfield areas" in the "Ross Project" alone, as described on page xix of the DSEIS, how can all these multiple well-field limits simultaneously be "codified in the Applicant's NRC license," as the DSEIS asserts, when the "Applicant" must logically become the "Licensee" upon commencing operation of the first wellfield?
17. The DSEIS does not explain how the Applicant and/or the terms of its NRC License will prevent such "post-licensing, pre-operational baseline" water quality measurements from being contaminated by the combined effects, prior to sampling, of drilling, casing and testing large numbers of injection and recovery wells, and from the effects of previous and ongoing exploratory drilling to delineate the boundaries of the economically recoverable uranium resource. Nor does the DSEIS address how, in the course of simultaneously constructing, operating, and "restoring" numerous individual wellfields in sequence over many years, the Applicant and the License terms will avoid the obvious pitfall of operational wellfields degrading the "post-licensing, pre-operational" water quality baselines in subsequent adjacent

monitoring wells targeting the same aquifers. As demonstrated by the statistically invalid baseline values reported for the Kingsville Dome ISL operations in Texas (TWC 1988; TWC 1990)², this flawed methodology will have the effect of creating a cascading deterioration in nominal “baseline” water quality measurements from wellfield to wellfield in the course of building-out the “Ross Project,” and pursuing adjacent “Lance District Development.” In my expert opinion, the effect of this flawed methodology will be to permit Strata Energy to pollute ground-water in a manner inconsistent with the NRC’s regulatory intent.

18. Another element of the Petitioners’ first contention is the failure of the NRC materials license process to accurately and independently assess the ore zone. *See* Sass Decl. ¶ 15, Petition at 13. The review in the DSEIS primarily relies on the data in the application, which in my expert judgment is insufficient to conclude that the regional water quality in the ore zone exceeds the EPA drinking water Maximum Concentration Limits (MCLs) for uranium and radium-226. Although NRC admits that data are available, the NRC simply states: “The data from 2011 are generally consistent with the 2009 and 2010 data, indicating a representative characterization of ground-water quality.” (DSEIS at 3-39). The 2011 data are not provided in the DSEIS and, until they are provided, it is my finding that these data are insufficient to establish representative water quality in the regional baseline wells.

19. Another element of the Petitioners’ first contention was the failure of the NRC materials license process to provide a scientifically sound sampling regime prior to the issuance of a license and during the course of the public environmental review. *See* Abitz Decl. ¶¶ 16-19, Petition at 14. As with a number of other elements in dispute, there has been no substantive change between

² Baseline for Kingsville Dome Production Area Authorization (PAA) 1 and PAA 2 were established two years apart and much higher values were measured for PAA2 (PAA1: uranium = 0.164 mg/L; radium-226 = 22 pCi/L. PAA2: uranium = 1.89 mg/L; radium-226 = 92 pCi/L). Note that baseline was established for these PAAs with invalid statistical methods, as outlined in paragraph 10 of this declaration.

the ER and the DSEIS. As noted in our original declaration, in my expert judgment, Strata must lay out a systematic grid covering the project area, and select at random points in that grid to locate baseline wells. Existing water-quality data from Strata's six regional wells can be used to estimate the approximate standard deviation of the population (which must be done for each quarter to eliminate temporal trends), and this methodology can be used to estimate the number of wells needed to reach the stated statistical confidence for obtaining a representative number of samples from the regional project area aquifer.³ Such an industry-standard, statistical sampling approach, with a stated level of decision confidence, is the only valid scientific method available to Strata if they wish to conclude that the water quality in the ore zone does not meet the EPA MCLs for uranium and radium-226.

20. We provide an example (using VSP software) and subsequent explanation of how this sampling might look.

	2010 Uranium Results (ug/L)			
	1st Q	2nd Q	3rd Q	4th Q
22-18OZ	0.070	0.033	0.069	0.033
14-18OZ	0.096	0.109	0.109	0.085
21-19OZ	0.017	0.008	0.024	0.005
34-7OZ	0.041	0.038	0.044	0.028
34-18OZ	0.062	0.059	0.046	0.041
42-19OZ	0.011	0.010	0.010	0.009
Median	0.052	0.036	0.045	0.031
Mean	0.050	0.043	0.050	0.034

³ NRC guidance is to place one baseline well in every four acres (NRC, 2003; p. 5-39), but Petitioners are not suggesting that 312 wells (1248 acres proposed for ISL well fields divided by 4) are strictly necessary to obtain representative water samples. Fewer locations can be achieved with good statistical design, but no such effort has been made or suggested by the NRC. In any event, a systematic grid and well-designed statistical sampling plan is necessary.

std dev	0.033	0.038	0.035	0.029
SW test statistic 95% conf	0.952	0.883	0.948	0.892
SW critical value 95% conf	0.788	0.788	0.788	0.788
95% LCL mean	0.023	0.012	0.021	0.010
95% UCL mean	0.076	0.074	0.080	0.057
t stat	1.46	0.837	1.42	0.298
t critical value 90% conf	1.48	1.48	1.48	1.48
Conclusion	accept null hypothesis because t stat < t crit value			
Null hypothesis	regional groundwater < 0.03 mg/L			
Type I error (alpha)	0.1; 90% confident we will accept null hypothesis when it is true			
gray area	0.005 above uranium MCL (0.035 mg/L)			
Type II error (beta)	0.5; 50% chance to accept null hypothesis if the true mean is 0.035 mg/L			
Sample Requirements	73	96	82	57
Null hypothesis	regional groundwater < 0.03 mg/L			
Type I error (alpha)	0.1; 90% confident we will accept null hypothesis when it is true			
gray area	0.01 above uranium MCL (0.04 mg/L)			
Type II error (beta)	0.5; 50% chance to accept null hypothesis if the true mean is 0.04 mg/L			
Sample Requirements	19	25	21	15
Null hypothesis	regional groundwater < 0.03 mg/L			
Type I error (alpha)	0.1; 90% confident we will accept null hypothesis when it is true			
gray area	0.01 above uranium MCL (0.04 mg/L)			
Type II error (beta)	0.2; 20% chance to accept null hypothesis if the true mean is 0.04 mg/L			
Sample Requirements	50	66	57	39

21. The statistical summary in paragraph 20 indicates that the six regional monitor wells are an insufficient number of wells to conclude, with a stated level of confidence (90% in this example), that uranium exceeds the EPA MCL in the OZ aquifer. To perform this analysis with parametric statistical tests (e.g., student t test), the data must be evaluated with the Shapiro-Wilk (SW) test to determine if the distribution is normal or lognormal. If the data are neither normal nor lognormal, non-parametric test methods must be used. The SW test statistic is greater than the SW critical value, which indicates that the six results for each quarter follow a normal distribution, and the 95% lower control limit (LCL) of the mean is below the EPA MCL, which indicates that the true uranium mean of the regional aquifer could be below 0.03 mg/L. Because the data are normally distributed, the student t test can be used to test the hypothesis (90% confidence level used in this example) that the true uranium mean is less than the EPA MCL (0.03 mg/L). The results of the student t test show that the t statistic is above the t critical value, and we have to accept the null hypothesis that the true uranium mean for the groundwater in the OZ horizon is less than the EPA MCL of 0.03 mg/L. If Strata believes the true uranium mean in the OZ horizon is above the EPA MCL, they must collect additional random samples and rerun the SW and Student t tests to determine if the null hypothesis can be rejected, which would demonstrate that the true uranium mean is above the EPA MCL. The *sample requirements for different Type II errors and contamination scenarios* indicate a minimum of 15 and maximum of 96 locations would be needed to test the alternative hypothesis that the true uranium mean is above the EPA MCL.
22. Another element of the Petitioners' first contention is the statistically invalid biased collection of non-representative samples from screens placed through part of the OZ water horizon that only sample water in contact with the ore zone, rather than the entire column of water in the OZ

sand interval. *See* Abitz Decl. ¶ 22, Petition at 14. Regarding this element, little has changed between the ER and DSEIS, as screen lengths for the existing six monitor wells in the OZ zone are approximately ¼ to ½ the thickness of the OZ sand (Table 1 in Abitz 2011) and centered on the ore zone. This has the effect of biasing the groundwater sample to high values for uranium, radium-226 and other uranium progeny and associated ore metals (e.g., arsenic, molybdenum, vanadium, etc) due to the disturbance and oxidation of the ore during well construction and development. I am aware that NRC Guidance (2003; p.5-43) also recognizes this bias and the NRC states that fully screened intervals are more accurate in their representation of the water quality that a user of the water will encounter. Therefore, in my expert opinion, the present monitor wells in the OZ horizon do not collect a representative groundwater sample.

23. Further, the lack of analysis found in the DSEIS exacerbates the dispute between the parties over the need for a meaningful environmental review of baseline water quality prior to any final licensing decisions. For example, in Tables 3.6 and 3.7 of the DSEIS, Strata's six cluster wells are grouped together to report average and ranges for each water horizon, and there is no mention of the proper statistical methods for evaluating individual wells prior to grouping them and calculating an average or range for the aquifer horizon (Gilbert, 1987; Matzke et al., 2007; ASTM, 1998; EPA, 1989; 1992a; 1992b; 2009; NRC, 2003). A simple averaging or simply reporting a range of the values from all wells is inappropriate, unless it can be shown with proper statistical methods that (i) the samples from the individual wells follow a normal or log-normal distribution, and (ii) an analysis of the data variance of each well demonstrates that the wells can be combined into a single population for statistical calculations. These standard statistical practices for the environmental industry (random grid sampling, statistically significant number of sampling locations, proper statistical tests, etc) are routinely and easily

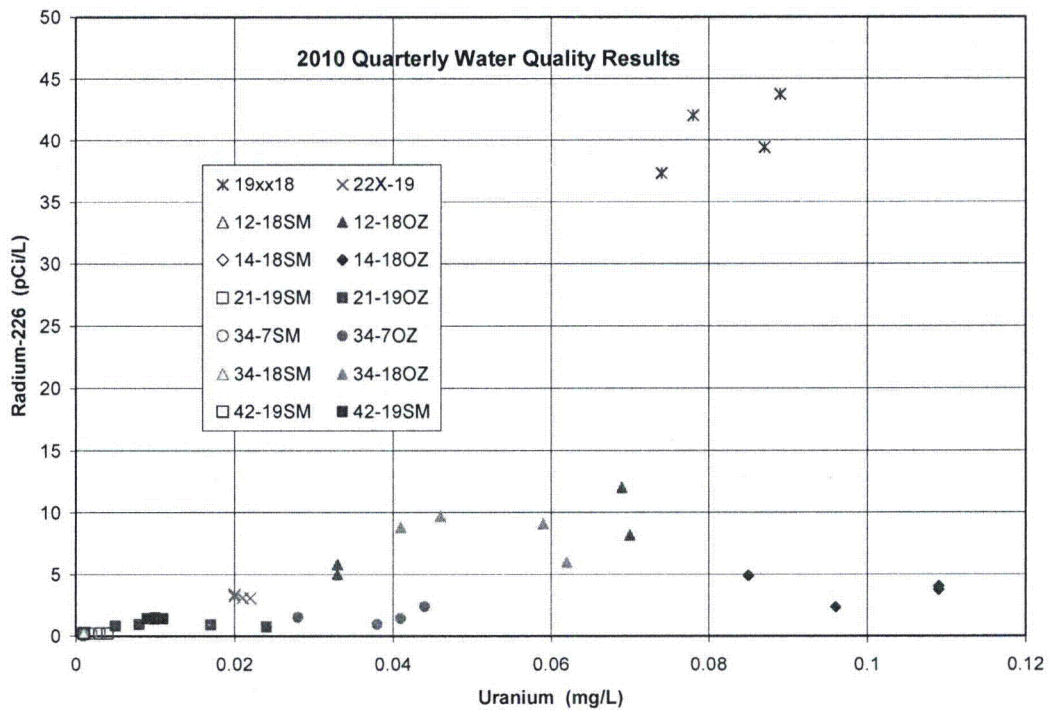
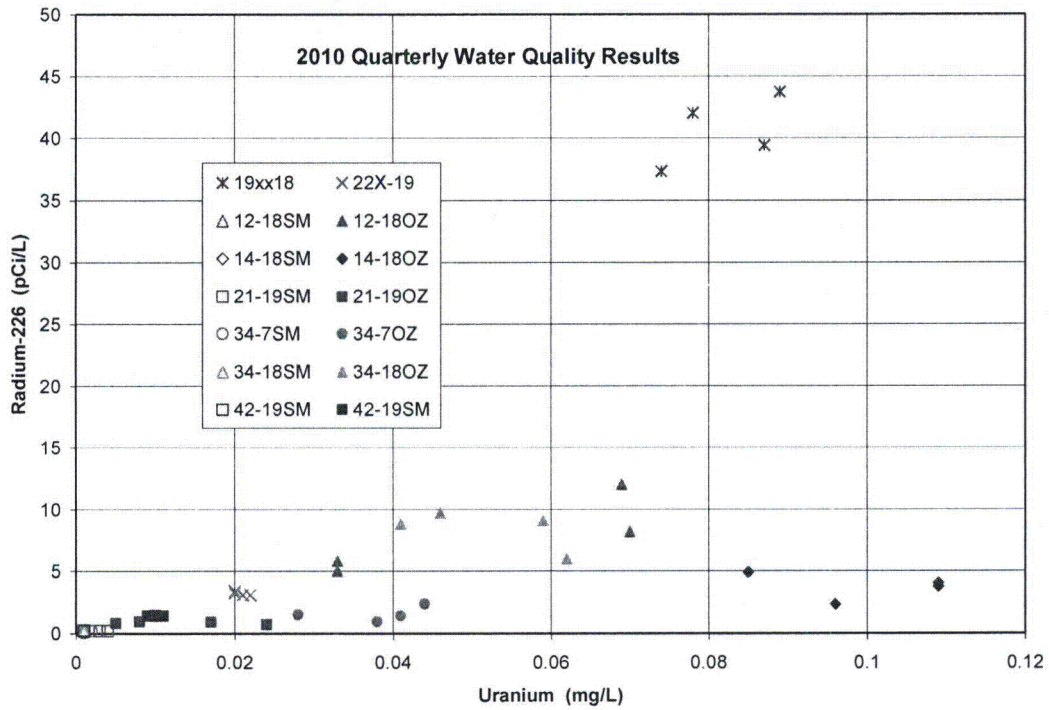
carried out using available statistical software (e.g., Visual Sampling Plan, available free from Pacific Northwest National Laboratory: <http://vsp.pnnl.gov>), and I note that the use of these standard industry practices is enforced by EPA when groundwater and soil samples are collected at CERCLA and RCRA sites (DOE 1998a-e; DOE 1999a-e; DOE 2000a-e; DOE 2001a-e; DOE 2002a-c; DOE 2003a-c; DOE 2004a-f; DOE 2005 a-d; DOE 2006a-o; DOE 2007a-j; DOE 2008a-b; DOE 2009).

Contention 2 – Analysis of Environmental Impact of Alternative Concentration Limits

24. An element of the Petitioners' second contention, which concerns uncertainty as to the detailed procedures employed for aquifer restoration (*see* Moran Decl. ¶ 70, Petition at 17), has not been functionally altered by treatment in the DSEIS. Indeed, it is my finding that the same elements that precipitated Petitioners' contentions are found in the DSEIS. As an example, Strata "estimates that aquifer restoration for each wellfield would take approximately eight months" (DSEIS at 2-33, but *see*, suggestion of six months at 4-34). However, the DSEIS treatment of restoration is based on what Strata informed the agency, and not an independent analysis of how long restoration would take. The DSEIS provides a general description of aquifer restoration techniques but does not say which would be deployed in which wellfield for how long and why; and there is no differentiation in aquifer restoration techniques between the 15-25 estimated wellfields. It is well established that no pilot-scale or full-scale ISL mining operation has restored their contaminated groundwater to the baseline values cited in the initial license permit (Hall, 2009; Staub et al., 1986; Deutsch et al., 1984). Importantly, ISL operators are unable to restore the groundwater to baseline values, even erroneously poor baseline values that are biased by high by oxidation of the ore zone during drilling and well development, invalid sampling protocols, and improper statistical manipulation of analytical results.

Examining the established scientific facts it is apparent, in my expert judgment, that the probability is vanishingly small that ISL-contaminated groundwater can be restored to baseline values when those values are properly determined with valid scientific and statistical techniques (*i.e.*, lower concentrations than heretofore presented by Strata or NRC).

25. Failure to restore the groundwater under the Nubeth pilot-scale ISL operation is clearly evident in the consistently elevated uranium and radium-226 concentrations observed in samples from industrial well 19xx18 (Figure 1), which served as the extraction well to the Nubeth pilot-scale test (Figure 3.15 in the SEIS). The uranium-radium-226 trend observed for all Strata cluster wells from the OZ horizons and industrial well 22x19 lies well below the radium-226 values for 19xx18, and the high radium-226 values can only be explained by the capture of the contaminated plume that remains from Nubeth's failure to restore groundwater after their six-month pilot-scale test. In my expert opinion, failure to restore the groundwater after a short six-month pilot-scale project should have clearly communicated to the NRC staff that it will not be possible to restore a full-scale ISL operation in 8 months (DSEIS at 2-33).
26. Figure 1. Variation plot for uranium and radium-226 showing distinct radium-226 values for 19xx18, which are due to the capture of the Nubeth contamination plume.



27. Given overwhelming scientific evidence of the failure of the ISL industry to restore groundwater to pre-mining water-quality standards, NRC should be analyzing the actual

likelihood of restoring groundwater to true baseline conditions, and not simply accept Strata's position that restoration to baseline values is possible because of the Nubeth project "demonstration of successful ground-water restoration and site reclamation." See DSEIS at 2-11 line 43.

28. Another element of the Petitioners' second contention, the failure to adequately define the specific aquifer restoration criteria/standards during the NEPA process and prior to licensing the facility (see Moran Decl. ¶ 70, Petition at 17), is also unaltered by treatment in the DSEIS. Here, NRC Staff admits that the restoration criteria are not known at this time. See contention 1 above: "The purpose of aquifer restoration is to restore the respective aquifer to its baseline conditions, as defined by post-licensing, pre-operational constituent concentrations." DSEIS at 2-32

29. Another element of the Petitioners' second contention, the suggested six-month restoration period, is far too short given the past history of failed ISL restoration at all ISL sites, including the Nubeth pilot-scale project (see Abitz Decl. ¶ 28, Petition at 18). Again, the DSEIS does not discuss or analyze the credibility of Strata's estimated restoration timeframe.

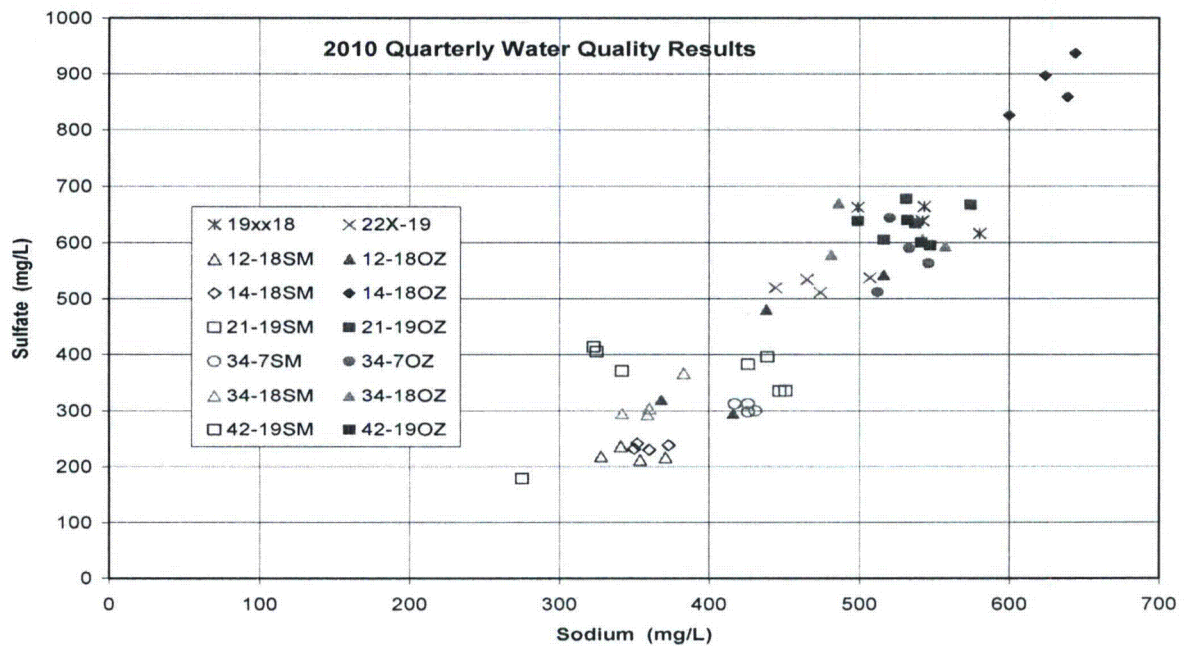
Contention 3 – Fluid Migration

30. With respect to Petitioners' third contention, Strata's failure to sufficiently describe and analyze information about boreholes and aquifer isolation to demonstrate that fluids would be contained during and after mining operations, Petitioners focused on the over 5,000 exploration boreholes drilled in the area which can serve as pathways for fluid migration. See Moran Decl. ¶¶ 22,31; Abitz ¶13 Petition 21-23. Again, there is little alteration in this fundamental dispute with the issuance of the DSEIS.

31. The DSEIS admits there are abandoned wells but does not disclose any total amount beyond information Strata has relayed to the agency. Indeed, the DSEIS discloses that hydrologic connection between the OZ aquifer and DM aquifer exists “due to improperly plugged previous exploration drillholes that have not yet been properly abandoned.” DSEIS at 4-35. But, DSEIS does not consider the water quality impacts of these wells in relation to the Ross Project because NRC says groundwater impacts would be “minimized by the Applicant locating the drillholes within the wellfields beneath the Proposed Action as well as plugging and abandoning them.” DSEIS at 4-36. In short, the DSEIS simply assumes the feasibility of locating and plugging these thousands of drillholes and relies on the applicant to correctly perform these actions, stating that, “[t]o prevent communication between aquifers during uranium-recovery operation, the Applicant proposes to actively locate and plug all exploration drillholes prior to beginning wellfield operations.” DSEIS at 3-38.⁴
32. Strata constructed and developed six monitor-well clusters within the project boundary and performed 24-hour pump tests on four of these wells in July 2010 (12-18OZ, 21-19OZ, 34-7OZ, 42-19OZ; Addendum 2.7-J of Strata TR 2011). In my expert opinion, neither the number of wells tested for hydrological parameters nor the short duration of the pump test establish adequate hydrological information to demonstrate control of groundwater over 1,866 acres of complex fluvial stratigraphy (Addendum 2.6-C of Strata TR 2011). Moreover, hundreds of exploration boreholes remain unplugged and there is no clear indication that all the boreholes will be found and abandoned in accordance with proper procedures (Addendum 2.6-B of Strata TR 2011).

⁴ However, “As of October 2010, the Applicant has located 759 of the 1682 holes thought to exist from Nubeth exploration activity and has plugged 55 of them.” DSEIS at 2-44.

33. The DSEIS does not at all address any of the significant data gaps in the conceptual and numerical hydrologic models put forward to support Strata's license application. This silence is inexcusable because the DSEIS does note that horizontal and vertical excursions of mining fluids occur at all ISL operations, and the vertical excursions were traced to thinning of the confining layer in the complex fluvial stratigraphy and improperly abandoned exploration bore holes (SEIS, p. 4-32, lines 41-43).
34. Demonstration of adequate hydrologic control is not a trivial matter because groundwater communication between the SM and OZ horizons is evident in the 24-hour pump test data from well 12-18OZ and the water-quality results for sodium and sulfate (Figure 2). Groundwater from the ore horizon (OZ; solid symbols) generally has higher sodium and sulfate, relative to the overlying groundwater (SM). However, mixing of the groundwater from these two horizons is clearly indicated by the linear trace of the sodium and sulfate trend on Figure 2. In my expert opinion this is unquestionably demonstrated by the mid-location of plotted samples from 22X-19, a well that is screened through the OZ and SM zones (Section 2.7.3.3.1, p.2-169, Strata TR). If 14-18OZ is taken as the unmixed groundwater from the ore horizon, all other OZ samples are shown to have a component of SM water, as they lie between 14-18OZ and 22x-19. Note that the strong mixing between the horizons is unequivocal for samples from 12-18OZ, which plot with the samples from 22x-19 and the SM horizon.
35. Figure 2. Water-quality results for sodium and sulfate indicate groundwater mixing of the ore zone (OZ) and overlying horizon (SM).



36. Figure 2 also illustrates that, the closer that a pair of samples plots for a given cluster well (e.g., 12-18SM and 12-18OZ), the higher the probability for groundwater contamination by communication between the two groundwater zones during ISL operations. In contrast to mixing between the 12-18 horizons, 14-18SM and 14-18OZ samples cluster tightly and are well separated on the plot. An explanation for the distinct separation of the 14-18 horizons on the sodium-sulfate plot may be that the density of exploration boreholes is lower around this cluster well and less communication between the SM and OZ horizons has occurred (*i.e.*, 14-18 may provide a snapshot of the distinct chemistry of the horizons prior to the drilling of thousands of exploration boreholes).

37. Additionally, it is also known that 22x19 is screened through the SM and OZ zones, and there is no detailed engineering analysis to show the effect of the industrial well operation on the ISL operations. The complexity of the stratigraphy coupled with hundreds of unplugged boreholes, established mixing between the SM and OZ zones, and the high-yield industrial wells requires

many more test wells over the 1,866 acres and much longer pump test intervals to obtain the needed hydrologic data to assess the control of mining fluids during ISL operations. The DSEIS is silent on these complexities and provides no convincing hydrologic data to support Strata's contention that mining fluids will be controlled to prevent groundwater pollution.

Contention 4 – Cumulative Impacts

38. With respect to the Petitioners' fourth admitted contention, the failure to sufficiently describe cumulative groundwater quantity impacts and the failure to quantitatively evaluate impacts of the proposed Lance District expansion and the project as a whole reflects a problematic perspective. While the DSEIS acknowledges cumulative impacts will occur from foreseeable projects (see DSEIS at 2-13), there is a dearth of meaningful analysis in the agency's document and the petitioners' concerns remain unaddressed.
39. The DSEIS briefly notes cumulative impacts to water drawdown from future "satellite" projects: stating consumption could increase to 356 gal/min from the 122 gal/min estimated for the Ross Project. DSEIS at 5-24. This estimate is based on aquifer yield that is proportional to uranium recovery amount, and the DSEIS lacks specific analysis about projected drawdown amounts. The DSEIS also lacks analysis about irreversible trends - it simply estimates that quantity "would also be essentially restored within 24 years after the issuance of the NRC license" and therefore suggests impacts would be small. DSEIS at 5-25. Further, there is no analysis of cumulative water quality impacts - just the Nubeth pilot-scale ISL operation, but no analysis of the prospective parts of the entire Ross project or even the greater Lance District project.
40. Indeed, what NRC does look at is essentially limited to the OZ zone, due to the proposed confining layers (p.5-22, lines 44-46). This conflicts with scientific data and NRC statements

that horizontal and vertical excursions of mining fluids occur at all ISL operations, and that the vertical excursions were traced to thinning of the confining layer in the complex fluvial stratigraphy and improperly abandoned exploration bore holes (DSEIS, p. 4-32, lines 41-43). Therefore, the layers are not confining due to complex fluvial stratigraphy (Addendum 2.6-C of Strata TR 2011), unplugged boreholes (Addendum 2.6-B of Strata TR 2011), hydrological evidence for connection between OZ and SM during the July 2010 24-hr pump test on 12-18OZ, and water quality analyses that show mixing between SM and OZ (Figure 2).

41. Further, NRC considers cumulative groundwater impacts for the Ross Project to occur over 24 years. DSEIS at 5-23, lines 9-15. The agency notes average consumption of 122 gal/min over 6 years for the Ross Project; but the basis and calculation to derive the quantity of groundwater over this period is absent (p. 5-24, lines 12-14). NRC then states the average increases to 356 gal/min when including the Kendrick, Richards, and Barber satellite areas; based on scaling water consumption to uranium production between Ross Project and all satellite operations, but no period of consumption is given by the agency. It is perplexing why there is a lack of mass balance calculations, because information is given to estimate total gallons consumed (i.e., 356 gal/min over 24 years equates to 4.5 billion gallons of groundwater, or enough water to cover 13,800 acres to a depth of 1 foot). Note that NRC and Strata are mute on groundwater loss due to failure to restore aquifers to true baseline conditions, which could be another 56,000 acre-ft (assuming 1866 acres multiplied by 100 feet of sand thickness with a porosity of 0.3)
42. NRC states that Strata cannot estimate the current withdrawal of groundwater from the Lance and Fox Hills formations because the geological interval is not recorded by the Wyoming engineer's office (p. 5-24, lines 23-28). It is my finding that this conclusion is grossly disingenuous, as location and depth of wells are given (line 24) and both the NRC and Strata

have intimate knowledge of the regional geology to correlate these locations and depths with the geological interval.

43. Again, without any independent analysis, NRC cites Strata on concluding that the OZ horizon is unattractive as a groundwater source due to depth (400 fbs), and due to the presence of overlying aquifers (p. 5-24, lines 31-33). This statement contradicts the NRC statement (p.5-24, lines 1-4) on the city of Gillette, which extracts groundwater from the Fox Hills Formation at a depth of 500 fbs and mixes this high TDS water with groundwater of lower TDS to produce potable water for the city. The use of Fox Hills groundwater by the city of Gillette also exposes the fallacy of the NRC/Strata argument that the groundwater in the OZ is unsuitable for human consumption. Clearly, the groundwater from the OZ horizon can be blended with lower TDS water to produce potable water for human consumption.

/s/ Dr. Richard Abitz (electronic signature approved)

Dated: May 6, 2013

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
STRATA ENERGY, INC.,) Docket No. 40-9091-MLA
)
(Ross In Situ Recovery Uranium Project))

**DECLARATION OF CHRISTOPHER E. PAINE ON BEHALF
OF THE NATURAL RESOURCES DEFENSE COUNCIL &
POWDER RIVER BASIN RESOURCE COUNCIL IN SUPPORT OF
CONTENTIONS 4/5A AND 6**

I. INTRODUCTION

I, Christopher Paine, declare that the following statements are true and correct to the best of my knowledge.

1. My qualifications and experience relevant to this proceeding are as follows: from August 2007 to March 2013, I held the position of Nuclear Program Director for Petitioner Natural Resources Defense Council (NRDC) and now hold the title of Senior Policy Adviser; from June 1991 to July 2007 I held the position of Senior Policy Analyst in the NRDC Nuclear Program; from February 1987 to May 1991 I was Legislative Assistant for Nuclear Energy and Arms Control to Senator Edward M. Kennedy of Massachusetts. In these positions I have gained a detailed knowledge of the statutory requirements and practical implementation of the Atomic Energy Act (AEA) and National Environmental Policy Act (NEPA). I have participated as a professional staff member in oversight investigations by Committees of the Congress concerning: the proliferative impacts of nuclear technology export licensing; the qualifications of a controversial former NRC Executive Director of Operations (EDO) to serve in a post subject to Senate confirmation; and the use of

fraudulent weld radiographs during construction to document regulatory compliance at a nuclear power plant. I have given declarations in prior and ongoing NRDC litigation challenging the adequacy of NEPA documents prepared by federal agencies, including the NRC, and I have been invited to appear before the Commission three times within the last two years to present NRDC's views on the Commission's regulatory response to the lessons of the Fukushima nuclear accident, and on the way NRC rules frequently function to suppress meaningful public participation in the nuclear licensing process. I am a 1974 graduate of Harvard College.

2. The observations and comments that follow in this declaration are based on my professional experience, on a review of relevant portions of the DSEIS for the Ross ISR Project in Crook County, Wyoming, and Strata's Environmental Report (ER), and on numerous other documents, for which URLs are provided in the text, that contain new and significant information concerning the scope and environmental consequences of the proposed NRC licensing action that was not properly considered in the Applicant's ER and the NRC Staff's DSEIS.
3. This declaration sets forth the historical and factual basis for Petitioners Contention Six that the DSEIS fails to consider the environmental impacts of, and appropriate alternatives to, the applicant's actual proposed project, and instead improperly segments environmental analysis of the project by framing the Proposed Action under review as a small part of the Applicant's planned and scheduled In Situ Recovery (ISR) activities in the Lance District. The declaration also supports the need for the expanded NEPA analysis called for in Petitioners' Contention 4/5A.

4. When the NRC Staff issued a Notice of Intent to prepare the SEIS for the “Ross Uranium Recovery Project” on Nov. 16, 2011, it did not describe a proposed scope for the environmental analysis, and in fact noted the “NRC’s Part 51 regulations do not require scoping for SEISs.” As a consequence of the Staff’s decision not to voluntarily undertake a formal public scoping process for the DSEIS, the task of correctly divining the proper scope for the Proposed Action that would be subjected to detailed environmental analysis in the SEIS became the sole responsibility of the NRC Staff.
5. By the time of the Prehearing Conference on standing and admissible Contentions on December 20, 2011, or at any point in the ensuing months while it was preparing the SEIS, the NRC Staff could have and should have understood, from its own detailed regulatory knowledge of Strata’s mining plans, that the scope of the Proposed Action delineated for detailed NEPA analysis in the SEIS no longer fairly reflected the widening scope of Strata’s proposed mining scheme, advancing well-field deployment schedules, and stepped-up drilling activities in adjacent areas well beyond the proposed boundaries of the “Ross Project.”
6. At any point between issuing the Notice of Intent in November, 2011 and filing the Draft SEIS in March 2012, the Staff could have exercised its inherent discretion and authority, stepped-back, and recognized that the scope of the Proposed Action subjected to detailed environmental analysis in the DSEIS had become too narrow and, with each advancing month, was becoming increasingly susceptible to the charge of being arbitrary and capricious, given the steady stream of ongoing disclosures to financial markets by the (wholly-owned) Applicant’s Australian parent company, Peninsula Energy, Ltd., of its plans, schedules, advance preparations and financing to promptly begin ISL mining of

multiple “Lance Projects” – large areas outside the comparatively small “Ross Project” area that is the subject of environmental analysis in the DSEIS.

7. But NRC Staff chose not to notify the Applicant or the public, via a revised Notice of Intent to prepare a SEIS, that the Applicant’s swiftly advancing plans for multiple “Lance Projects,”—adjacent to the small “Ross Project” area analyzed in the SEIS and spread over a much larger area with consequently wider environmental impacts—now necessitated a significantly revised scope for the Proposed Action and reasonable alternatives that NEPA requires be subjected to detailed environmental analysis. Instead, the Staff issued a Draft SEIS that fails to encompass the actual scope of ISL mining activities and environmental impacts that would be triggered by issuance of the pending draft license for the “Ross Project.”
8. While Petitioners had previously expressed their strong concerns, via Admitted Contentions 4/5A, regarding future mining activities beyond the scope of the Ross Project that could properly be viewed as “reasonably foreseeable” for the purpose of assessing cumulative impacts, as Director of the NRDC Nuclear Program, I, and the other petitioners were not aware, as of the deadline for filing contentions based on the ER in October, 2011, of the immediacy and definitive extent of the Applicant’s plans to mine expanded areas contiguous to the “Ross Project” area, attributes that remove them from the domain of “reasonably foreseeable” future actions that must be assessed for their “cumulative impacts,” and place them squarely in the domain of the Applicant’s “Proposed Action.”
9. Based on its statements at hearing, the NRC Staff, as discussed further below, likewise appears to have been unaware at the time of the immediacy and full extent of the Applicant’s plans that would be set in motion by the granting of a license for the “Ross

Project The ER as originally filed made oblique and even contradictory references to these future plans. At the Prehearing Conference on December 20, 2011, Attorney for the Petitioners, Geoffrey Fettus, noted their concern with the Applicant's position that "cumulative impacts associated with any potential future Strata satellites will be addressed in the environmental reports associated with each such satellite," and then continued as follows: "Strata's application carves up the potential impacts into pieces, preventing the public and regulators from realistically looking at the long term cumulative impacts." (Prehearing Transcript at 138).

10. However, statements made by NRC Staff during the Prehearing Conference on December 20, 2011 encouraged Petitioners to continue viewing these future plans, in legal terms, as appropriately belonging to the domain of contingent, uncertain, but nonetheless "reasonably foreseeable" future cumulative impacts in the vicinity of the Proposed Action, and not yet sufficiently defined to be part of the Proposed Action itself. In particular, at one point in the proceeding Judge G. Paul Bollwerk (for the Board) was inquiring of the Staff whether any follow-on cumulative impacts of the Ross Project could alone be sufficient to grant standing to Petitioner Pam Viviano, a rancher with two properties in the general vicinity of the Ross Project, but not immediately adjacent to its boundaries as then proposed in the License application:

JUDGE BOLLWERK: "...but just hypothetically, if the next project was going to be right next to her ranch, could she raise it then?....

MS. MARSH (for the NRC Staff): I would say she would need to wait until the opportunity for hearing for the new site came about. *If it were proposed as part of this action ...she could certainly get standing by arguing a harm for that (emphasis added).*

JUDGE BOLLWERK: Well, when you say proposed, I mean, here – as the staff has pointed out, I believe, *the applicant has made it clear that they're looking to extend these additional sites on this corridor that they marked out.* All I'm saying is if that corridor went across from her property rather than down to the south, wouldn't she have, at least facially, a pretty good argument?

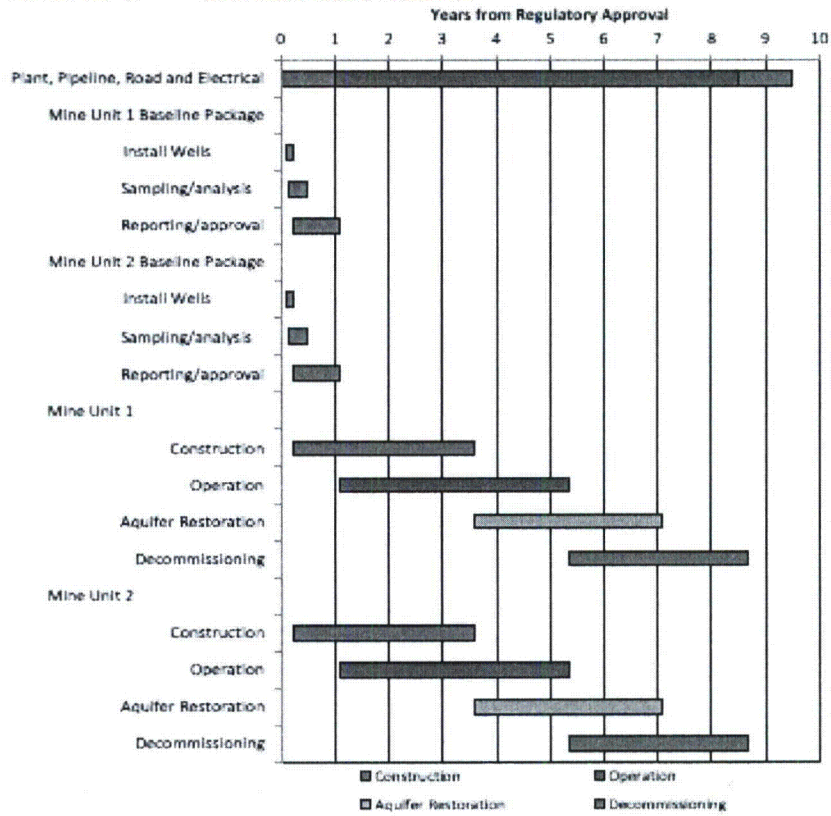
MS. MARSH: ...But we don't – I mean, at this point, *we don't have the details of where any of these –if any of these proposed actions will in fact take place or what the details of those proposed sites might be. We'd be – I mean, we'd really be working at hypotheticals about where these sites might be or when or if they would actually be done.* The staff has said that we believe that the new – an expansion is reasonably foreseeable, but we haven't said that they are definitely going to happen, so we would just be hypothetically arguing about things that might not even happen. *And I don't have anything more.* (12/20/12 Prehearing Transcript, at 43-44) (emphasis added).

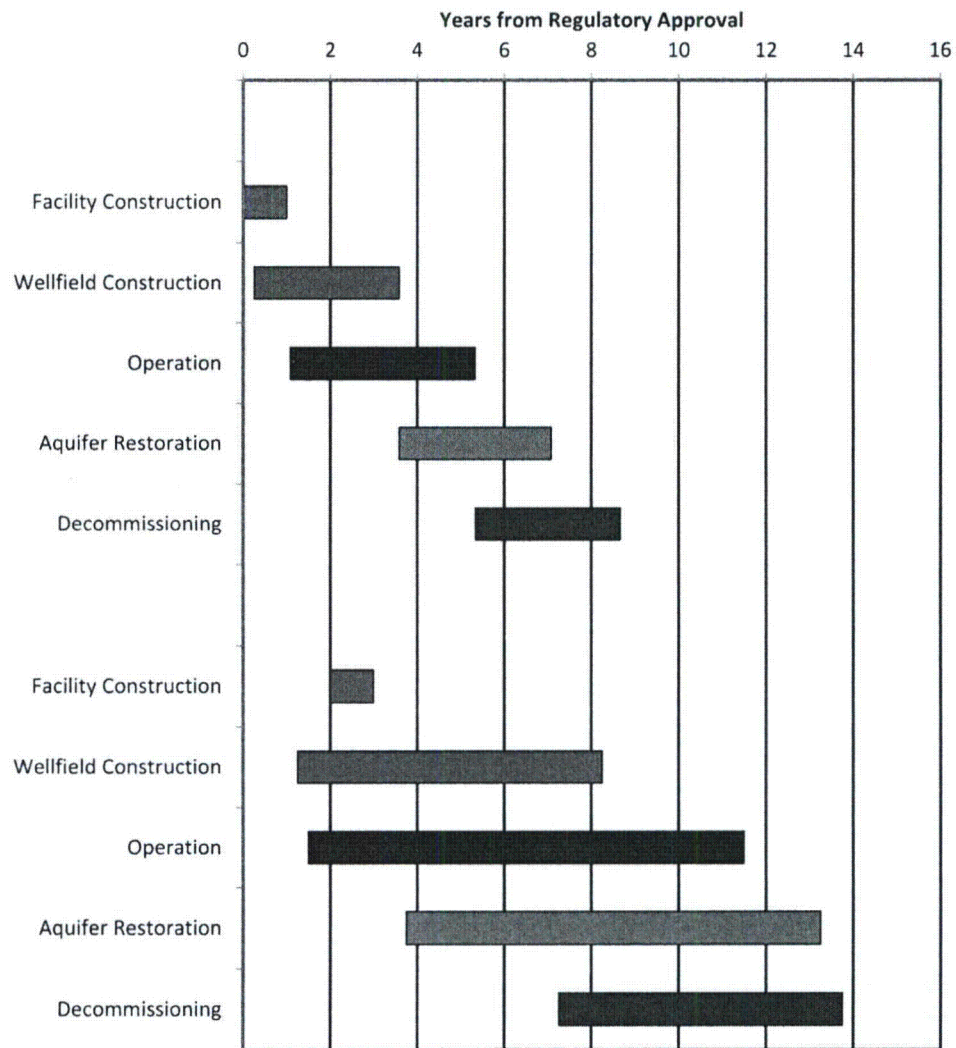
11. I and the other Petitioners likewise relied on the statement by Staff at hearing that “the cumulative impacts coming from future expansion of the ISR in the Lance District” was admissible because “the information doesn't exist in the [license] application...when it comes to the ISR expansion, that information is entirely lacking.” Speaking for the Staff, Ms. Marsh stated, “The Staff will get the information from Strata, any other source it needs to, and then we'll do the analysis [in the] SEIS. At that point, if the Staff addresses the contention, that contention will be moot and the petitioners would have to raise another contention.” (Prehearing transcript, at 147-48).
12. Petitioners have taken Ms. March's counsel to heart and have now “raised another contention,” Contention 6, based on new information that was not available to them in the

ER, but has since come to light in the SEIS, and to a much greater extent, in other documents generated by the Applicant's Australian parent company, Peninsula Energy, Ltd. that are not referenced in the DSEIS.

13. Below are two Figures, from the ER and DSEIS, respectively, that suggest a significant evolution has occurred in the Applicant's and the NRC's strategy and timing for uranium recovery operations in the Lance District beyond the Ross Project. The first figure below is cited in ER Section 1.3.2 on the "*Ross ISR Project Schedule*," and shows a 9.5 year project. This exact figure is not repeated in the SEIS, but one resembling it appears on SEIS page 2-8, but now carries the title, "Figure 2.6: Schedule for *Potential Lance District Development*," and conveys a timeline of 14 years, 4.5 years longer than the schedule described in the ER (see next page for figure).

Figure 1.3-1. Ross ISR Project Schedule



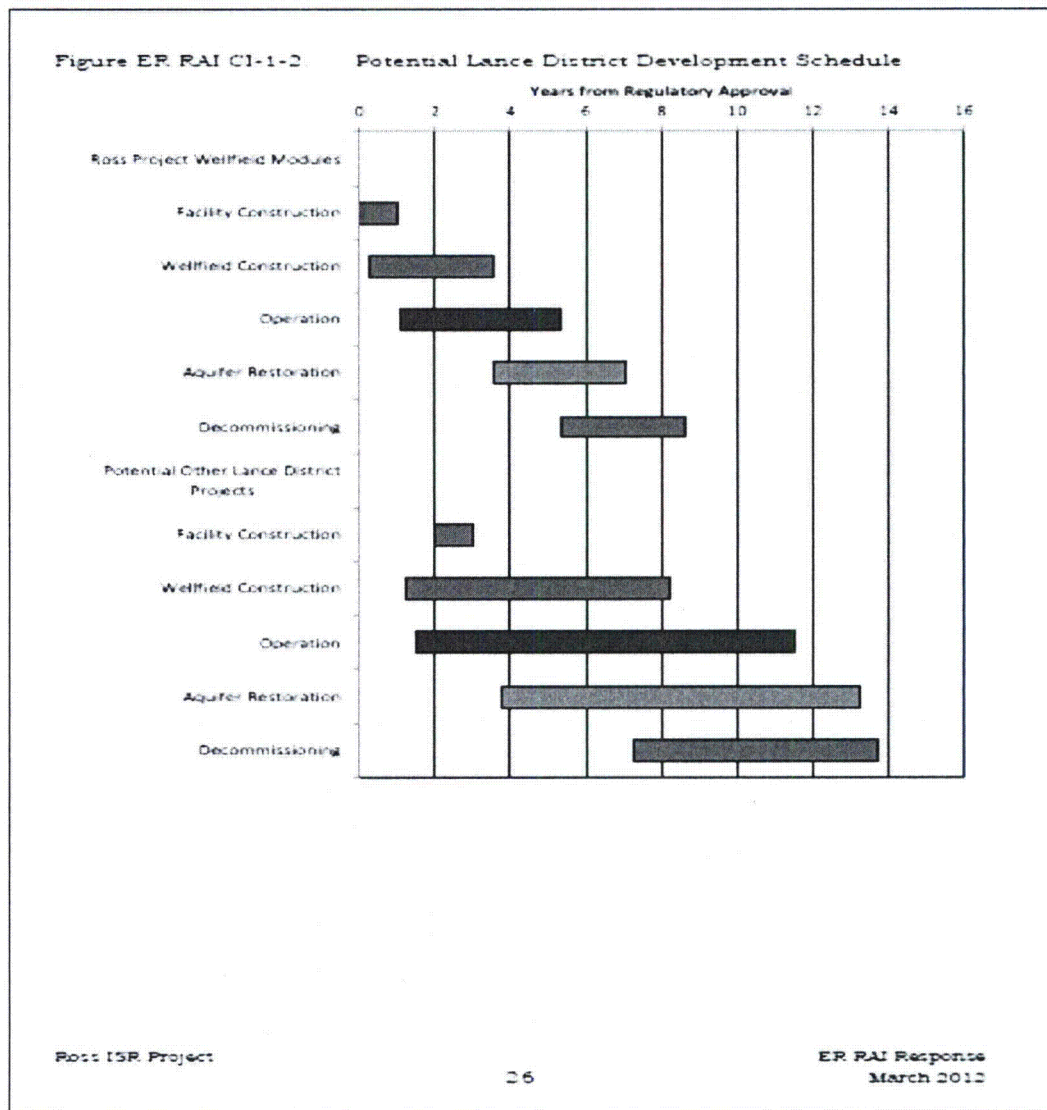


Source: Strata, 2012a.

**Figure 2.6 [from page 2-4 of SEIS]
Schedule for Potential Lance District Development**

14. If one traces the above figure back to its source (“Strata, 2012a” RAI Response), one finds that the NRC Staff has deleted the subheadings “Ross Project Wellfield Modules” and “Potential Other Lance District Projects” that were present on the above chart in the RAI, subheadings that indicate that the Proposed Action *is really to license a single large ISR project via the Ross Project license and subsequent license conditions or amendments*

thereto, in which the various subsequent development “phases” clearly significantly overlap each other in time, and “satellite facility” construction *begins just a year after the first Ross Project well-field goes into operation*, and satellite well-field construction *begins less than a year after construction of the Ross Project well-fields*. Here is the March 2012 RAI Figure:

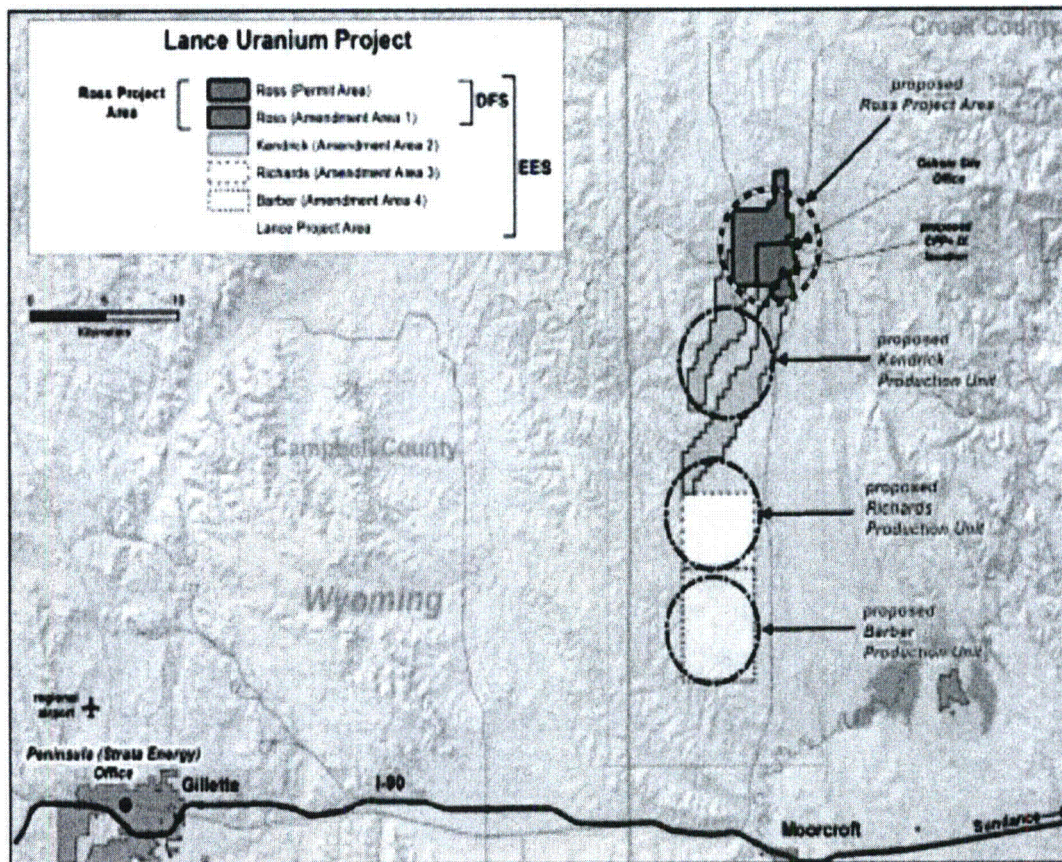


15.

16. Note the NRC Staff's deletions (from the previous chart) of the headings "Ross Project Wellfield Modules" and "Potential Other Lance District Projects" from the above chart provided by Strata. Otherwise it is the same chart.

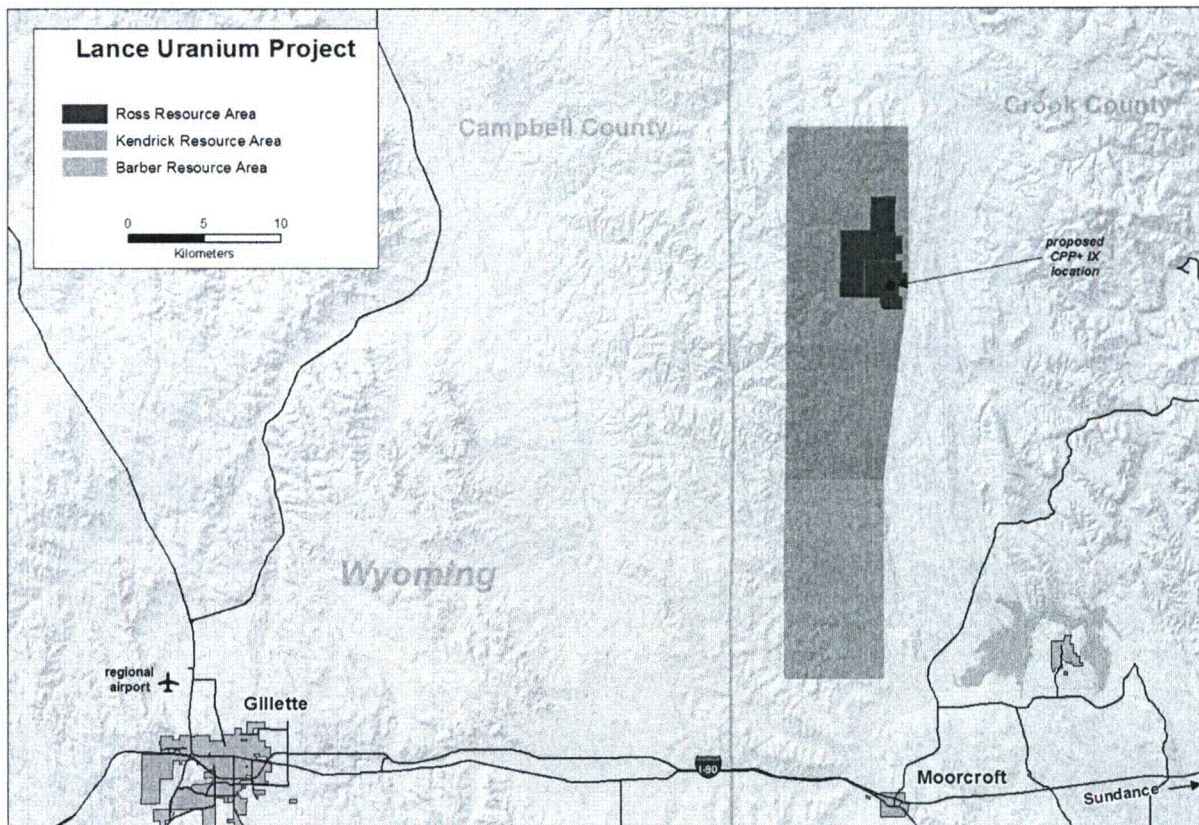
17. Below is Strata's plan, provided to NRC in the RAI of March 2012, and now reproduced on page 2-4 of the DSEIS, to march through the entire Lance District uranium roll-front deposit over the 14 years following regulatory approval. It reveals that the proposed "Ross Permit Area" subjected to analysis in the ER and DSEIS is but a small fraction of the total area to be mined. It was the NRC Staff's NEPA obligation, not Petitioners', upon receipt of this information to modify the scope of the Proposed Action in the DSEIS to fairly reflect the reality that this expanded sequence of planned "production units" would have much wider environmental impacts, over a more defined timeframe, than previously described in the ER.

Figure ER RAI CI-1-1. Potential Future Lance District Projects



Source: Peninsule 2011

- 18.
19. Below is another map (dated 01/23/13) from the Australian corporate parent, Peninsule Energy, which differs from the previous maps in the ER, showing an expanded "Ross Resource Area" within an even larger "Kendrick Resource Area, which is in turn contiguous at its southern boundary with a "Barber Resource Area." This map is *prima facie* evidence that even the basic boundaries within which the environmental impacts of this proposed licensing action will be felt have not yet been defined, much less all the potential environmental impacts adequately considered as required under NEPA.



20. Figure 1: Resource Area Location Map (Source: Peninsula Energy, January 23, 2013)

21. Note that the NRC/Strata delineated “Ross Project” is merely a subset of a larger “Ross Resource Area” that is in turn included within an even larger “Kendrick Resource Area” that the company intends to mine more or less simultaneously with what it now calls the “Ross Production Unit,” and a further “Berber Resource Area” now abuts the southern boundary of the Kendrick Resource Area and extends far to the south. In other words, *there is no discrete “Ross Project,”* and it represents a tiny fraction of the total resource area that the Applicant is planning and preparing to mine. The proposed “Ross Project” license is merely a legal artifice to facilitate the deployment of a much larger ISL mining operation, now called “The Lance Projects,” that extends over a much larger area.

22. This view is substantiated by a careful examination, which I conducted in April and early May of 2013, of a collection of company releases and presentations for the period October 2010 through March 2013 that I found via a web search on the website of Strata's Australian parent company, Peninsula Energy, Ltd. (Strata Energy is a 100%-owned U.S. subsidiary of Peninsula). In the paragraphs that follow, I will summarize the relevant highlights of that review:
23. In a release dated 4 January 2011, "Peninsula Completes Major Regulatory Milestone," [<http://www.pel.net.au/images/peninsul-19--ayidiesieg.pdf>] the company announced that it had submitted an application for an NRC Combined Source and 11e.(2) Byproduct Material License on December 31, 2010, requesting authorization to "construct and operate an in-situ uranium recovery (ISR) facility at Peninsula's Ross ISR Project, located near Oshoto, in north-eastern Wyoming (Ross Project). The proposed facility would consist of wellfields, pipelines, and a central plant to process extracted uranium into yellowcake for commercial use in nuclear power plants." The release noted that, "as previously announced, in October of 2010 the NRC conducted *an unprecedented on-site visit and pre-license application submission review* of Strata's proposed license application to identify any major acceptance or technical/environmental review issues. Feedback from that critical review was then incorporated into the final license application." This release noted that the "proposed Ross ISR site...forms *part of the total project area and the first to be permitted for production.*"(emphasis added) This statement is significant as it suggests that NRC staff may have been made aware of the expansive nature of the overall project design even before the inception of the formal licensing process.

24. In a release dated 2 February 2011, “Peninsula Announces 33Mlbs U₃O₈ Resource at Lance,” [<http://www.pel.net.au/images/peninsul-19--zaayeikeis.pdf>] the company stated, “The Directors...are pleased to announce a further upgrade of the JORC-complaint Resource Estimate for the Lance uranium projects in Wyoming, USA (**Lance Projects**)” [boldface in original]. (From this point forward, this is the nomenclature that the company uses to refer to its proposed ISR mining in Wyoming. The proposed “Ross ISR Project” mentioned in prior press release becomes the “Ross Permit Area.”) The company also disclosed that “98% of [the] *Ross Permit Area* resource” had been defined to “Indicated or Measured Category,” and that “resource conversion and exploration drilling will continue with two rotary mud rigs employed full time in the northern Ross area [i.e. outside the “Ross Permit Area”] and a third rig engaged at Barber to identify additional uranium mineralization in the area and increase the resource inventory at Barber.” It also noted, “The Lance project covers an area of over 120km² within which there is a combined total of at least 305 line kilometers (190 mile) of known stacked roll fronts,” and goes on to discuss the “upgrade” in the “mineralized potential of the *Lance Projects*” (emphasis added).
25. In a release dated 15 February 2011, “Peninsula Signs Uranium Sales Agreement,” [<http://www.pel.net.au/images/peninsul-19--cheojaozoo.pdf>] the company announced, “Long term sale agreement secured for U308 from *Lance Projects*” (emphasis added).
26. In a release dated 24 Feb. 2011, “High Grade Drill Results Continue at Lance,” [<http://www.pel.net.au/images/peninsul---fooxeiquoo.pdf>] the company disclosed that “one drilling rig is currently engaged within the Ross Permit area while a second drilling

rig is dedicated to areas immediately adjacent to the north-west. Within the next quarter, a third drilling rig will also commence drilling at Barber.”

27. In a release dated 14 March 2011, “WDEQ Confirms Permit to Mine Application Complete and Adequate,” [<http://www.pel.net.au/images/peninsul---teewaimith.pdf>] the company noted that this was “one of two primary permits necessary to conduct ISR operations at the *initial production center of the Lance Projects* in Wyoming, USA.” (emphasis added)

28. In a release dated 4 May 2011, “Nuclear Regulatory Commission has Commenced Formal Safety and Environmental Acceptance Review,” [<http://www.pel.net.au/images/peninsul---eiyaoxaeko.pdf>] Peninsula’s Executive Chairman, Mr. Gus Simpson, stated, “The confirmation that the NRC expects to complete its acceptance review ahead of schedule is an example of the efficiencies being achieved *through the pro-active involvement of Strata and the regulatory bodies* during the new streamlined licensing process” (emphasis added). Such “pro-active involvement” of the company with NRC staff early in the licensing process suggests the possibility that the full-scope of the company’s plan, pursuant to the proposed license, to swiftly mine expanded areas within the Lance District, may have been communicated to relevant officials within the agency early in the application process, in plenty of time to have informed an appropriate scope for NEPA analysis of the Proposed Action in the DSEIS.

29. In a release dated 16 May 2011, “Ross ISR Permitting Ahead of Schedule,” [<http://www.pel.net.au/images/peninsul---vaemoocohl.pdf>] Peninsula Energy limited said it was “pleased to announce that recent feedback from key US regulatory agencies has confirmed that the Ross In-Situ recovery (ISR) license application continues to advance ahead of schedule.” Again, such “feedback from key US regulatory agencies” presented an

opportunity to advise the Company regarding the necessary scope of the NEPA analysis that would be required to adequately consider the environmental impacts of its integrated plan to solution-mine large areas of the Lance District.

30. In release dated 17 June 2011, "Peninsula Announces Major Resource Upgrade and Definitive Feasibility Study Time Frame," [<http://www.pel.net.au/images/peninsul---ugeoceotei.pdf>] the company disclosed that "resource conversion" drilling – i.e. to convert "inferred resources" to "indicated and measured resources" suitably delineated for expanded ISR mining -- as well as "exploration drilling" would continue "outside the permit area" in the "northern Ross area" and "at Barber." The company included a table in the release showing "Lance Project U₃₀₈ Resource Estimate by Area and Category," which named three ISR areas targeted for development: "Ross Permit Area," "Ross," and "Barber," with the total resource estimates for "Ross" and "Barber" dwarfing the total for the "Ross Permit Area." The release further states, "one drilling rig is currently dedicated *to the Barber area in order to delineate sufficient mineralization to support the planned remote ion exchange (IX) plant that will provide additional feed to the central processing plant (CCP) [sic] to be located at Ross.*" Note that there is nothing conditional or vaguely prospective about this scenario. It is described nearly two years ago as part of the Applicant's definite integrated plan, but this is not how it was presented in the ER.
31. In a release dated 29 June 2011, "Nuclear Regulatory Commission Accepts Application for Detailed Technical and Environmental Review," [<http://www.pel.net.au/images/peninsul---iathuchuej.pdf>] Peninsula Energy stated, "The Ross Project forms the core of *the greater Lance Project*, with primary mineral processing activities centered in *this initial production area*" (emphasis added). The release again took note of Strata's "strong lines of

communication with the various regulatory bodies,” and announced, “The acceptance review was completed in 55 days, well short of the NRC internal guideline of 90 days for such reviews. With this prompt acceptance, the Ross Project continues to move forward on schedule.”

32. In a release dated 12 Sept. 2011, “DFS Update and Lance Drilling Program Continues to Identify (sic) High Grade Mineralization,” [<http://www.pel.net.au/images/peninsul---jeemaefith.pdf>] Peninsula Energy noted that its initial Definitive Feasibility Study (DFS) “was focused exclusively on the *Ross Project Area (Ross Permit Area and Ross Amendment Area)*,” and that the “preliminary results of the Initial DFS are positive, which is particularly encouraging as *the Ross Project Area covers only a small area and resource base of the larger Lance project*” (emphasis added). In other words, the NRC staff knew, or certainly should have understood by September, 2011, that the “Ross Permit Area” described in the docketed License Application comprised only a part of a larger planned “Ross Project Area” *that already included* an additional “Ross Amendment Area,” and that this expanded Ross Project Area in turn covered “only a small area and resource base of the larger Lance project.”
33. In a release dated 20th December, 2011, “Resource Upgrade Drilling Intercepts High Grade Mineralization at Lance,” [<http://www.pel.net.au/images/peninsul---uivahtupie.pdf>] Peninsula Energy announced that recent drilling in the wider “Ross Project Area” west of the “Ross Permit Boundary” had “produced thick higher grade intercepts, and the area is now recognized as *a key area for resource expansion given its close proximity to the proposed Central Processing Plant site*” (emphasis added).

34. In a release [<http://www.pel.net.au/images/peninsul---singaefehu.pdf>] dated 21 December 2011, “Definitive Feasibility and Expanded Economic Studies Confirm the Viability of the Lance ISR Projects,” [note closeness in time with Dec. 20th Prehearing] Peninsula Energy disclosed “highlights” of these two studies, including a “planned steady state annual production rate of 2.19 mlbs U₃O₈ per annum *from three production units within three years of start-up*” (emphasis added). This amount was clearly vastly in excess of the forecast annual production from the “Ross production unit” (aka the “Ross Project”) in Strata’s license application. This release stated that the Ross Project requires only “the first production unit” with “a capacity of 750,000 lbs per annum,” with “production *ramping up over three years* to 2.19 mlbs per annum steady-state production *with the inclusion of the Kendrick and Barber production units*” (emphasis added). The initial 750 klbs U₃O₈ Ross production unit would produce “for a ten year minimum life from...measured and indicated resources contained within the *original Ross project permit application and* an area containing furthered measured and indicated [i.e. minable] resources that is *an extension of the Ross permit area*” (emphasis added). Just to make clear, even implementation of the small subset of the Proposed Action that is outlined in the ER and SEIS would require an “extension of the Ross permit area” to achieve the “10 year minimum life” outlined in the company’s “Definitive Feasibility Study.”

35. Further reinforcing the integrated nature of the actual full-scale ISR proposal under review in the Licensing process, Peninsula stated that its Definitive Feasibility Study was premised on spreading the capital, fixed-operating, and decommissioning costs of the CPP “across multiple production units within Lance...over an extended period of time,” and cited the companion “Lance Expanded Economic Study” (EES) as “illustrating” this overall project

financial strategy. In the EES, further production units were “assumed to be *permitted for development at Kendrick and Barber and to follow Ross into production at 12 month intervals feeding the CPP*” (emphasis added). The company noted it was “continuing the drill program at Kendrick and Barber...*to provide the feedstock for the expanded project*...The CPP will house the initial ion exchange (IX) circuit and will see an additional IX circuit installed with the commissioning of *the second production unit planned for Kendrick* located in close proximity to the CPP. Additional IX circuits for remote satellite production units will not be housed at the CPP, but *at locations near the remote production units*. Loaded resins from these facilities will be transported to the CPP for further processing into yellow cake....Prior to the commissioning of the Barber production unit an additional US \$8 million capital investment will be required to expand CPP capacity to 2.25 mlbs per annum.

36. Peninsula Energy’s December 21, 2011 release [<http://www.pel.net.au/images/peninsul---singaecheu.pdf>] noted that the purpose of the Lance Expanded Economic Study (Lance EES) “was to demonstrate the Lance projects’ continued economic vitality and robustness *over an extended life beyond the Ross production unit*, which is limited to measured and indicated resources of 6.2 mlbs [of] recovered U₃O₈ (emphasis added).” Strata’s Australian parent further noted, under the heading “Permitting and Project Development Timeline,” that swift WDEQ and NRC acceptance of the completeness of its applications attested to their “quality,” and “provided the Company with the basis to submit amendments to bring on further production units in a *timely and efficient manner*.” The following statement contained in the Dec. 21st release is of particular interest: “Following a recent review of the permitting strategy the Company is confident in finalizing permitting. In addition *all new*

project areas are being designed so they are contiguous with the Ross permit area and as such will be deemed to be amendments to the Ross permit (once issued) rather than standalone applications. This strategy will significantly reduce the permitting process and timing going forward” (emphasis added).

37. In a release dated 16th January 2012, “NRC Approves Earlier Deep Well Disposal Testing,”

[<http://www.pel.net.au/images/peninsul---aelaoquuhu.pdf>] Peninsula Energy announced that the “United States Nuclear Regulatory Commission (NRC) have advised Peninsula’s wholly owned subsidiary Strata Energy, Inc. that the development of a deep disposal well [DDW] to test subsurface conditions would be considered exploration and Strata can begin drilling without any further approval. This decision allows the Company to proceed with DDW testing significantly ahead of original schedule and could see flow rates at the upper limits of expectation that would lead to significant capital expenditure reductions at the *Lance Projects* (emphasis added). . . . The NRC has confirmed that Strata can, upon the issue of the SML [Source Material License] apply to have the test deep disposal well converted for operations.” Executive Chairman Gus Simpson added, “Proactive decision-making like this demonstrates the NRC’s objective approach to the assessment of proposed ISR developments and its understanding of the value to the Companies of obtaining project development information early.”

38. In a release dated 10 February 2012, “Peninsula Acquires Lance Projects Central

Processing Site,” [<http://www.pel.net.au/images/peninsul---fochahoung.pdf>] Peninsula Energy Limited announced that it “has acquired 240 acres covering the site of *the proposed Lance Projects Central Processing Plant (CPP)*,” still referred to a year later in the DSEIS as the “Ross Project facility” (emphasis added). (DSEIS at 2-1). Again, the statements of

Peninsula Energy betray no uncertainty or ambivalence regarding the scope of its proposed actions.

39. In a release dated 13 February 2012, “NRC License Process,”

[<http://www.pel.net.au/images/peninsul---eisaesheez.pdf>] Executive Chairman Gus Simpson stated, “Based on previous license reviews, the grant of standing is a procedural matter and the Company does not anticipate delay to the review process or grant of the SML [Source Materials License].”

40. In a release dated 24 February, 2011 [year is a typo – release makes clear year is 2012],

“High Grade Drill Results to Enhance Lance Resource,”

[<http://www.pel.net.au/images/peninsul---fooxeiquoo.pdf>] Peninsula Energy disclosed that its drilling along the Kendrick roll front system is consistently producing thick high grade intercepts which *has resulted in its prioritization due to its resource expansion potential and its proximity to the proposed site of the Lance Central Processing Plant.*” In a statement with environmental implications, in terms of establishing “baseline” water quality in the “post-licensing” sequential manner described in the ER and the DSEIS, the company disclosed that the these Kendrick roll fronts (K4 and K5) “are located to the east of and adjacent to the K3 roll front trend which is down-gradient from the main roll front within the permit area.”

41. In a release dated 27 February 2012, “Property Acquired for Lance Projects Operation,”

[<http://www.pel.net.au/images/peninsul---aihotheey.pdf>] Peninsula Energy announced that it had purchased, through its wholly owned U.S. subsidiary Strata Energy, Inc., an additional 34.5 acres that would “facilitate the expanded exploration and the proposed development of the Lance projects.”

42. In a release dated 5 April 2012, "Peninsula Advances Land and Mineral Rights at Lance," [<http://www.pel.net.au/images/peninsul---wiwahgaepa.pdf>] Peninsula Energy announced that it had "secured significant additional land and mineral rights for exploration and mining at its Lance Uranium Projects in north-eastern Wyoming. Executive Chairman Gus Simpson commented, "The increase in surface and mineral acreage highlights the success of *Strata's strategic land acquisition program*. What is currently held more than supports targeted exploration and production requirements at the Lance Projects." In a lengthy release date 3 May 2012, "Feasibility Study Upgrades Economics at Lance," [<http://www.pel.net.au/images/peninsul---ietheichai.pdf>] Peninsula Energy Ltd. reiterated many of the conclusions of its 21 December 2011 release (discussed previously above) and stated, "The *Lance ISR uranium projects* are ready to be transitioned to development stage following relevant permitting and project funding factors, which are all well advanced....The Company continues assembling a highly experienced team to successfully transition from explorer to producer and have the financial capacity to *fast track the project implementation* where possible" (emphasis added).
43. In a release dated 15 June 2012, "Spectacular Drill Results Continue at Lance Projects," [<http://www.pel.net.au/images/peninsul---daiquoocei.pdf>] Peninsula Energy Ltd. stated, "This drilling has been focused on converting inferred resources to the indicated category in the *planned Kendrick Production Unit* located to the west of the *Ross Production Unit*."
44. Dated 25 July 2012, "New Roll Front System Discovered at Lance Projects," [<http://www.pel.net.au/images/peninsul---aineevooch.pdf>] Peninsula Energy Ltd. graphically displayed the extent of its discoveries in the planned Kendrick Production Unit (see Figure 1 on page 3 of this release). The map shows a large area to the west and

southwest of the “Ross Production Unit” that was targeted because “success in this area could support a second ion exchange (IX) circuit within the central processing plant.”

45. In a release dated 15th October 2012, “High Grade Drill Results Continue at Lance Projects,” [<http://www.pel.net.au/images/peninsul---epongiiphe.pdf>] Peninsula announced, ‘Strata has suspended resource drilling for several weeks as it complete multiple clusters of aquifer monitoring wells *as part of the Mine Permit extension process*. This process is being undertaken *to include the Kendrick Production unit in the mine planning schedule going forward.*’ (emphasis added)
46. In a release dated 7 November 2012, “\$70 Million Industrial Revenue Bond for Lance Projects Wins Unanimous Crook County Commission Support,” [<http://www.pel.net.au/images/peninsul---aizuatheok.pdf>] Peninsula Energy Ltd. announced that the “\$70 million in requested Bonds represents 47% of the \$148.1 million required to construct the *Lance Projects Central Processing Plant, CPP expansion, Satellite Ion Exchange Plant, and initial well-field development*” (emphasis added).
47. In a release dated 8 November 2012, “Peninsula Receives Draft Source Material License,” [<http://www.pel.net.au/images/peninsul---aimohgaeto.pdf>] Peninsula announced that “issuance of the draft SML in less than two years after application submission reflects *a significantly accelerated schedule over the applications of others in the industry*, which have averaged 3 years or more in receiving draft licenses,” and noted, “The draft SML also *confirms regulatory bounding conditions upon which the project economics have been based*” (emphasis added). Since the “project economics” appear to be based on the successful implementation of the wider “Lance Projects” rather than the singular “Ross Project” described in the ER and the DSEIS, this statement supports the view that the

Proposed Action includes a planned regulatory pathway for expansion of the Ross Project to the scale needed to realize the “project economics” of the Applicant’s multiple planned “Lance Projects.” For the purposes of defining the scope of the Proposed Action to be subjected to NEPA analysis and detailed consideration of reasonable alternatives, such economically-driven expansion along a defined regulatory pathway must be deemed highly likely to occur and therefore clearly within the scope of the Proposed Action.

48. In a release dated 22 November 2012, “Peninsula Receives Permit to Mine,”

[<http://www.pel.net.au/images/peninsul---seraiquaef.pdf>] Peninsula stated that “within the coming weeks, Strata will commence allowable construction (pre the SML license) at the Lance Projects, including the development of deep disposal wells, monitoring wells, and CPP site and civil works.” Regarding this favorable development, Executive Chairman Gus Simpson stated, “With the issuance of the WDEQ Permit to Mine, the Lance Projects continue to gain momentum toward production. Yet again, the project team and regulatory authorities have achieved a significant project milestone on time and without issue.”

49. Regarding the activities and sentiments expressed in the preceding paragraph, while the focus of this declaration is on the factual basis for Contention 6, I cannot help but note in passing that the onset of what appears to be in NEPA terms a premature and potentially irretrievable commitment of resources to not only the “Ross Project” but even multiple “Lance Projects,” months before the appearance of even the draft SEIS for public comment, much less a Final EIS and Licensing decision, suggests that there is something seriously amiss with the timing of the NRC Staff’s implementation of the NEPA process, resulting in at least the appearance and possibly the reality that the Staff is engaging in prohibited *ex-post facto* NEPA analysis to rationalize decisions already made.

50. In a release dated 23 January 2013, “Lance Projects Resource Estimate Adds 2.5 Million Measured and Indicated Pounds,” [<http://www.pel.net.au/images/peninsula---ehenoghaox.pdf>] Peninsula noted, “The resource delineation and exploration drilling program was suspended at the Lance Projects in October 2012 and the rigs deployed to complete *multiple clusters of aquifer monitoring wells as part of the accelerated Mine Permit amendment process that incorporates the Kendrick Production Unit in the mine planning schedule.*” (*emphasis added*)The drilling along the Kendrick roll front system has produced consistent thick high-grade intercepts and has been prioritized due to its resource expansion capacity and its proximity to the proposed site of the *Lance Central Processing Plant* [aka “The Ross Project CPP” in the SWEIS].

51. According to the DSEIS, “Strata’s Proposed Action, the Ross Project, would occupy 697 ha [1,721 acres] in the north half of the approximately 90-km² Lance District, where the applicant is actively exploring for additional reserves.” [DSEIS at xviii]. By contrast, Peninsula Energy, in its January 23rd release cited above, states, “The Lance Project, operated by Peninsula’s US subsidiary, Strata Energy Inc., covers an area of over 120 km² within which there is a total of at least 305 line kilometers (190 miles) of known stacked [uranium] roll fronts. Of this total, only a small percentage has been explored, with over 90% of the drilling concentrated within the more advanced Ross, Kendrick, and Barber areas.” It is regrettable that this far into the NRC’s licensing and NEPA process, there remains such basic uncertainty in the public’s and apparently even the NRC’s knowledge regarding the scheduled, planned, and potential scope of uranium extraction activities that could occur in this region. This situation cries out for a comprehensive definition of the scope and scale of the activities and environmental impacts that could reasonably be

expected to ensue following an affirmative NRC decision to grant a license to Strata to pursue “The Lance Projects,” as described in detail in the preceding paragraphs of this declaration.

52. Peninsula Energy Limited’s most recent (2013) Company Presentation,

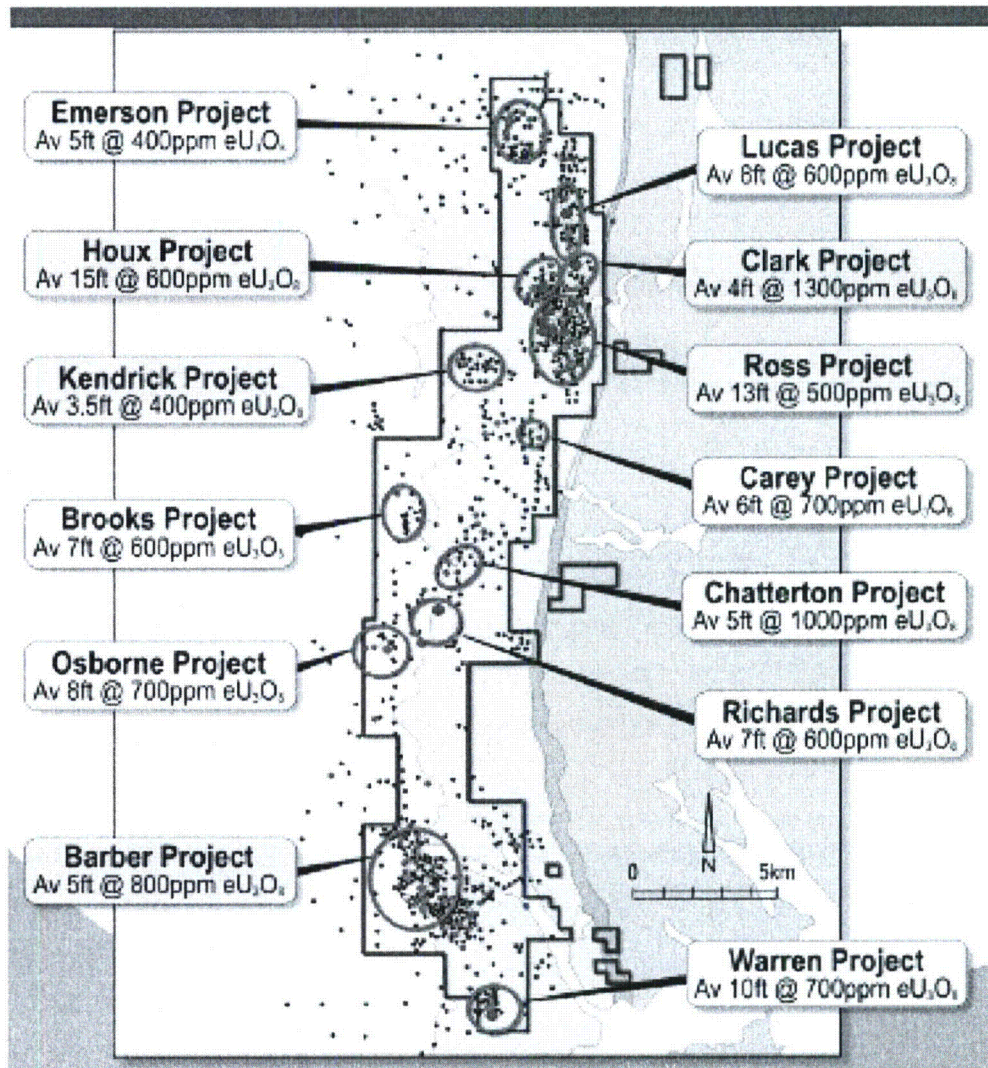
[<http://www.pel.net.au/images/peninsul---eineebeixe.pdf>] states in a slide on its “Business Plan” that it intends to “Commence ISR production at Lance Projects, Wyoming in 2014 building to 2.2 mobs U308 per annum over 3.5 - 4 years (plant capacity 3 mlbs per annum.” [It is simultaneously pursuing or seeking to acquire other uranium projects in South Africa and Australia, but intends to “Underpin Balance Sheet with Profit from Lance Projects.” The Company sees a large resource potential at the Lance, and foresees “70 + years of mine life.” By contrast, the DSEIS is vague on this issue, but the ER shows an operational mine life for the Ross Project of a little more than four years, and the DSEIS envisions a timeframe for cumulative impacts, including decommissioning of only 14 years for “Potential Lance District Development.” I do not know where the correct answer lies, but I am quite certain that it is not in the current “Ross Project” DSEIS, which bears little resemblance to the business plans and schedules for expanded mining that Peninsula Energy Ltd., has been disclosing to investors and financial markets for the past 2.5 years.

53. The graphic below from the Peninsula Energy Ltd. March 21 “2013 Company Presentation:

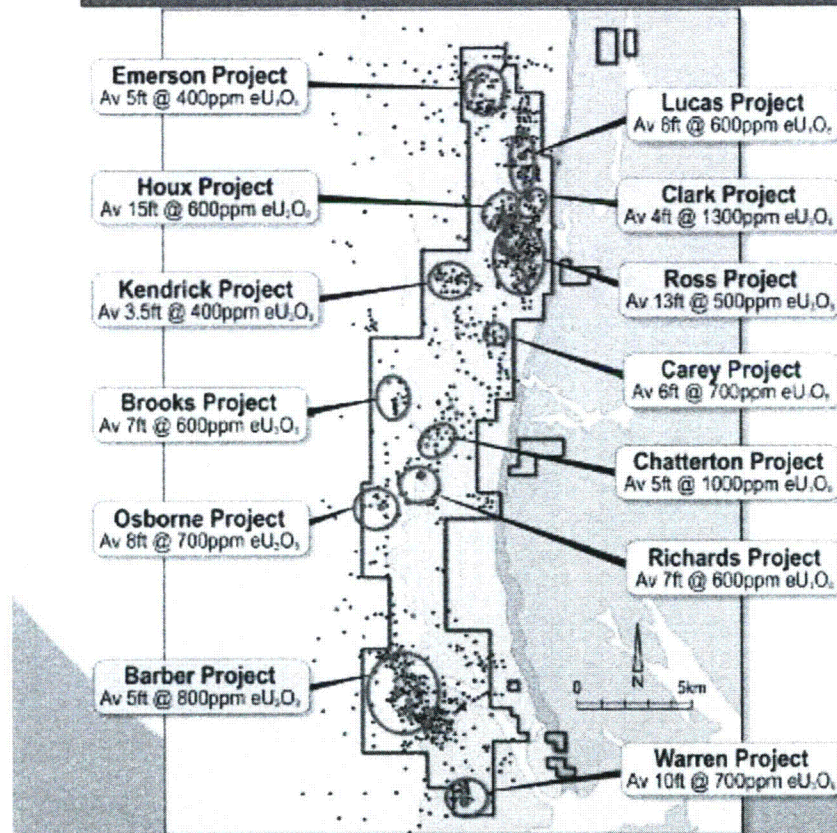
Emerging Producer” [<http://www.pel.net.au/images/peninsul---eineebeixe.pdf>] demonstrates that the “Ross Project” and its environmental impacts represent only a tiny fraction of the impacts that could be experienced as a result of the NRC decision to license a large and expandable “modular” ISR operation that can grow easily through the proliferation of nearby “amendment areas” and “satellite IX facilities.” The “Ross Project” is only one of 13 prospective uranium ISR projects that

Peninsula Energy Ltd. is planning to develop in the Lance District in the years and decades ahead. This situation demands thoughtful and careful NEPA analysis, beginning with a full statement of the scope of the actions and environmental consequences that could ensue from the granting of the proposed license.

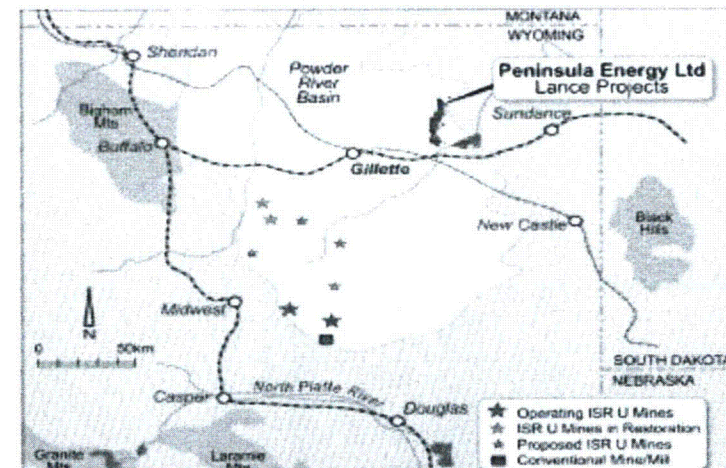
Detail from the March 21 Peninsula Presentation to the “2013 Mines and Money Conference”



Lance – Exploration Potential



- 13 historic resources
- 22 roll fronts extend for a combined linear strike length of 194 miles (312km)
- Exploration potential 158-217mlbs U₃O₈



LARGE RESOURCE POTENTIAL - 70+ YEARS MINE LIFE

54. As established by the preceding analysis in this declaration, almost from the beginning, the scope of the Applicant's planned activities has exceeded the public disclosure of them in the ER and now the DSEIS, although there has been greater candor, as I only recently discovered, with the investment community in Australia. At a minimum, the required rescoping of the Proposed Action must include all the additional mining projects in the additional resource areas – the “Ross Amendment Area,” “Kendrick Resource Area,” and the “Barber Resource Area” – that Peninsula has stated it is planning to exploit in the near term to amortize its investment in the CPP, utilize its full capacity, and make a profit for reinvestment in its uranium business elsewhere, and that could be put into production via an amendment to the initial license for the “Lance Projects Central Processing Plant” and “initial wellfields.”
55. Another valid approach might be to assume that entire measured, indicated, and inferred uranium resources, under the control of the Applicant in the Lance District and susceptible to development via this proposed license and “amendments” thereto, *actually get mined*, and then assess the environmental impacts and reasonable alternatives to that level of uranium mining in the region over the predicted 70 year “mine life” projected in Peninsula's March 21st presentation to the “2013 Mines and Money Conference” in Hong Kong.
56. One could imagine an analysis that combined both these approaches, demanding a rigorous analytical approach for estimating the impacts of the planned and scheduled projects described by Peninsula in its numerous releases (and summarized in this declaration), and then flowing from that analysis, using representative parameterized values to calculate the

environmental consequences of more distant future projects, until the resource under Peninsula's control is essentially mined-out.

/s/ (electronic signature)

Christopher E. Paine

Dated: May 6, 2013.