UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Alan S. Rosenthal, Chairman
Dr. Paul B. Abramson
Dr. Richard F. Cole

In the Matter of	Docket No. 40-8838-MLA
U.S. ARMY	ASLBP No. 00-776-04-MLA
(Jefferson Proving Ground Site)	February 28, 2008

NOTICE
(Inclusion of Parties' Proposed Questions Into Hearing Record)

During the course of the above-captioned proceeding, the parties submitted proposed questions for this Licensing Board to proffer at its October 22, 2007 hearing. In accordance with 10 C.F.R. § 2.1207(a)(3)(iii), as the Board today issued its Initial Decision, the Board now provides these questions to the Commission's Secretary for inclusion in the official record of the proceeding. They are attached.

FOR THE ATOMIC SAFETY
AND LICENSING BOARD[1]

_____/RA/_____
Alan S. Rosenthal, Chairman
ADMINISTRATIVE JUDGE

[1] Copies of this Memorandum and Order were sent this date by Internet electronic mail transmission to counsel for (1) the Licensee, (2) the NRC Staff, and (3) Intervenor.

ATTACHMENT

Save the Valley's Questions

I. STV Questions for NRC Staff Witness McLaughlin

A. Regulatory Framework

1. 10 CFR 40.42(g)(2) provides:

"The Commission may approve an alternate schedule for submittal of a decommissioning plan required pursuant to paragraph (d) of this section if the Commission determines that the alternative schedule is necessary to the effective conduct of decommissioning operations and presents no undue risk from radiation to the public health and safety and is otherwise in the public interest.

Is it the Staff position that this regulation controls the Commission's review of the Army's proposal to delay the submission of a decommissioning plan for the JPG DU site until 2011?

2. Is it also the Staff position that the five-year delay in the submission of a decommissioning plan requested by the Army is warranted because the performance of the site characterization activities proposed in the Field Sampling Plan (FSP) are "necessary to the effective conduct of decommissioning operations"?

3. Is it also the Staff position that the Commission should approve the five-year delay in the submission of a JPG DU site decommissioning plan even if the site characterization activities proposed in the Field Sampling Plan are not sufficient for the effective conduct of decommissioning of the JPG DU site beginning with the submission of a decommissioning plan in 2011?

4. Is it also the Staff position that the regulatory requirements that a JPG DU site decommissioning plan must meet are "irrelevant" for evaluating in this proceeding the adequacy for purposes of 10 CFR 40.42(g)(2) of the site characterization activities proposed in the FSP?

5. In the Staff view, how would the Commission find whether the site characterization activities proposed in the FSP are necessary to the effective conduct of decommissioning operations" without reference to the regulatory requirements that a JPG DU site decommissioning plan must meet?

6. In the Staff view, how would the Commission determine whether the site characterization activities proposed in the FSP are "otherwise in the public interest" without finding whether those activities would also be sufficient to support a JPG DU site decommissioning plan meeting the applicable regulatory requirements?

7. In the Staff view, would approval of the FSP and alternate scheduled proposed by the Army be warranted even if the Commission found that the site characterization activities being proposed would not be sufficient to support submission of a JPG DU site decommissioning plan in 2011?

8. If so, why? If not, why not?

9. In the Staff view, why would the approval of an alternate schedule which assured further delay beyond the additional five years being requested in this proceeding be "otherwise in the public interest"?

10. Is it the Staff view that the decommissioning plan for which an alternate schedule is being sought in this proceeding would provide for license termination under restricted conditions?

11. If so, why? If not, why not?

12. Is it the Staff view that a decommissioning plan which would provide for the restricted release of the JPG DU site would need to meet the requirements of 10 CFR 20.1403?

13. If so, why? If not, why not?

14. Is it the Staff view that a decommissioning plan which would provide for the restricted release of the JPG DU site would require the preparation by the Staff of an Environmental Impact Statement (EIS) and Safety Evaluation Report (SER)?

15. If so, why? If not, why not?

16. Assuming that an EIS and an SER would be required, what would be the length of the time period the Staff would expect to use for evaluation purposes in each document?

17. Is it the Staff view that a decommissioning plan which would provide for the restricted release of the JPG DU site would need to assess two future scenarios, one in which institutional controls endure and another in which they fail?

18. If so, why? If not, why not?

19. Is it the Staff view that in an institutional control failure scenario for the JPG DU site, the dose assessment analysis would include an exposure determination for at least a resident farmer with the farmer resident on the DU Site itself and using its soil, ground and surface water resources for subsistence purposes?

20. If so, why? If not, why not?

21. Would there likely be alternative critical group/average member exposure determinations made in the institutional control failure scenario?

21. If not, why not? If so, what critical groups/average members would the additional exposure determinations likely involve?

22. In a scenario in which institutional controls are assumed, for what critical groups/average members would the Staff expect exposure determinations likely to be made? Which of these critical groups/average members would be considered most "conservative"?

23. Assuming that the site characterization activities proposed in the FSP would be found insufficient to meet the requirements for an application for license termination under restricted conditions of the JPG DU site, what would be the Staff view as to the timing and means by which the additional activities required would be authorized and performed?

24. In the Staff view, why would the separate means and later timing envisioned for the additional site characterization activities required for license termination be "otherwise in the public interest" when compared to the alternative preferred by STV of including and completing those additional activities in the FSP and by 2010?

B. FSP Addenda

1. Does the Staff anticipate at this time that there will be future addenda to the FSP?

2. If not, why not? If so, what would be the anticipated purpose, scope and timing of those future addenda?

C. Public Meetings

1. Does the Staff anticipate at this time that it will convene future public meetings with respect to the FSP?

2. If not, why not? If so, what would be the anticipated purpose, scope and timing of those future meetings?

D. Recent Fish and Wildlife Service Sampling Activities

1. Is the Staff aware of the recent Fish and Wildlife Service sampling activities at JPG as reported in Dr. Henshel's surrebuttal testimony?

2. Does the Staff agree generally with Dr. Henshel's description of those FWS sampling activities?

3. If not, how would the Staff describe those activities?

4. Does the Staff view the samples collected by FWS to have potential value for FSP purposes?

5. If not, why not? If so, how would the Staff anticipate the value of the samples for FSP purposes could best be realized?

II. STV Questions for NRC Staff Witness Peckenpaugh

A. Definitions

1. Define the term "ground water" as it is used in your testimony.

2. As you define it, does "ground water" include all water below the surface of the earth?

3. If not, what water below the surface of the earth is excluded from your definition of "ground water"?

4. Is water flowing episodically through karst features such as sinkholes, tunnels and caves considered to be "ground water" according to your definition?

B. Karst Hydrogeology

1. As you understand the hydrogeology of the larger geographic area of southeastern Indiana in which the Jefferson Proving Ground is located, does that area include karst hydrogeology outside the boundaries of the Proving Ground?

2. Does that karst hydrogeology potentially include both “shallow” and “deep” levels?

3. If not, why not? If so, how do you define “shallow” and “deep”?

4. What elements of the FSP as currently designed will identify either or both “shallow” and “deep” karst in the vicinity but outside the boundaries of the Proving Ground? How?

5. Will these elements of the FSP as currently defined identify all significant karst features in the vicinity but outside the boundaries of the Proving Ground?

6. If not, why not? If so, how will the FSP as currently designed permit the Army and the Staff to be sure that they have identified all of the potentially significant karst hydrogeology outside JPG?

7. As you understand the hydrogeology of the Jefferson Proving Ground, is there karst hydrogeology within the boundaries of the Proving Ground?

8. Does that karst hydrogeology potentially include both “shallow” and “deep” levels?

9. If not, why not? If so, do you define “shallow” and “deep” the same within as outside JPG?

10. What elements of the FSP as currently designed will identify either or both “shallow” and “deep” karst within the boundaries of the Proving Ground? How?

11. Will these elements of the FSP as currently defined identify all significant karst features within the boundaries of the Proving Ground?

12. Were these elements able to identify independently all of the caves included in the Sheldon study?

13. If not, why not?

14. Does the karst hydrogeology within the boundaries of the Proving Ground extend into the Depleted Uranium test site?

15. Does that karst hydrogeology potentially include both “shallow” and “deep” levels?

16. If not, why not? If so, do you define “shallow” and deep” the same within as outside the DU area?

17. What elements of the FSP as currently designed will identify either or both “shallow” and “deep” karst within the boundaries of the DU test site?

18. Will these elements of the FSP as currently defined identify all significant karst features within the boundaries of the Proving Ground?

19. Were these elements able to identify independently all of the caves within the DU area which were included in the Sheldon study?

20. If not, why not?

21. Are there hydrogeologic interconnections known to convey water between the karst within and outside the Jefferson Proving Ground?

22. Are there hydrogeologic interconnections known to convey water between the karst within and outside the DU area?

23. Are those hydrogeologic interconnections potentially significant with respect to hydrologic flows within and outside the Jefferson Proving Ground?

24. Will the FSP as currently designed identify all of the actually significant hydrogeologic interconnections between the karst hydrogeology within the JPG DU site and the areas outside the DU site, both within and outside the JPG boundaries?

25. If not, why not? If so, how will the FSP permit the Army and the Staff to be sure that they have identified all of the actually significant hydrogeologic interconnections among the primary karst features within the JPG DU site and the areas outside the DU site, both within and outside the JPG boundaries?

26. The Army's mapping techniques for karst features requires that the feature be expressed as a visible linear anomaly that can be seen on aerial photographs, don't they?

27. The near-surface cave systems that can be physically entered along Big Creek are not mapped by combining the results of the Army's Fracture Trace Analysis and Electronic Imaging Survey, are they?

28. Those caves also do not have a surface expression that is visible on the aerial photographs employed by the Army, do they?

29. If the Army cannot map near-surface cave systems with its FSP methodology, upon what do you base your confidence that it can map cave systems at greater depths or in areas where they do not open to the surface?

30. If the Army cannot map cave systems with its FSP methodology, upon what do you base your confidence that its technological approach will identify and locate other karst features and interconnections?

31. Does karst hydrogeology present major challenges in modeling groundwater flows at sites like JPG?

32. If not, why not? If so, how so?

33. Will it be necessary to supplement RESRAD with an additional model or models to address these challenges?

34. What additional model or models would the Staff consider most suitable to address these challenges?

35. Have the site-specific data needs of this model (these models) been taken into consideration in the FSP as currently designed?

36. If so, how? If not, how would the Staff propose to address these needs in the future?

C. Flooding

1. Is Jefferson Proving Ground, including the DU area, subject to periodic flooding?

2. Based on the prior studies of JPG which you have reviewed, how would you describe the frequency and severity of the flooding to which JPG, including the DU area, is subject?

3. Do these floods periodically raise the levels of surface streams traversing JPG and the DU area? By how much?

4. Do these floods also affect the karst hydrogeology within JPG, including the DU area? How?

5. Do these floods have the capacity to move DU penetrators, fragments, and particles from their previous resting places to other locations, including locations outside of the DU area and even outside of JPG?

D. UXO

1. Are you a graduate of the U.S. Naval School of Explosive Ordnance Detection (EOD) or any other school recognized by the U.S. Army Corps of Engineers Huntsville Engineering and Support Center for purposes of unexploded ordnance training?

2. As what “level” of UXO Specialist (UXO Technician I, II, III or Senior UXO Supervisor) are you qualified under the requirements of Department of Defense Explosive Safety Board Technical Paper 18, “Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel” (December 20, 2004).

3. Are you in the US Army Corps of Engineers Huntsville Engineering and Support Center UXO Technician database?

4. If so, what is your reference number?

5. With respect to the Army's Field Sampling Plan, did you personally perform any investigatory or documentary activities pursuant to specific provisions of the document entitled “Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities” (EP 75-1-2, October 1, 2004)

6. If so, what activities pursuant to which provisions of EP 75-1-2?

7. Were the results of those activities documented in accordance with EP 75-1-2?

8. Is the documentation of those activities included in the Staff's prefiled testimony and exhibits in this case?

9. If so, which testimony and/or exhibits, specifically?

10. With respect to the Army's Field Sampling Plan, did you personally direct any other person to perform any investigatory or documentary activities pursuant to specific provisions of the document entitled "Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities" (EP 75-1-2, October 1, 2004)?

11. If so, what person (by name) with respect to what specific activities pursuant to which particular provisions of EP 75-1-2?

12. Were the results of those activities documented in accordance with EP 75-1-2?

13. Is the documentation of those activities included in the Army's or Staff's prefiled testimony and exhibits in this case?

14. If so, which testimony and/or exhibits, specifically?

III. STV Questions for Army Witness Cloud

A. Regulatory Framework

1. 10 CFR 40.42(g)(2) provides:

"The Commission may approve an alternate schedule for submittal of a decommissioning plan required pursuant to paragraph (d) of this section if the Commission determines that the alternative schedule is necessary to the effective conduct of decommissioning operations and presents no undue risk from radiation to the public health and safety and is otherwise in the public interest.

Is it the Army position that this regulation controls the Commission's review of the Army's proposal to delay the submission of a decommissioning plan for the JPG DU site until 2011, correct?

2. Is it also the Army position that the five-year delay in the submission of a decommissioning plan requested by the Army is warranted because the performance of the site characterization activities proposed in the Field Sampling Plan (FSP) are "necessary to the effective conduct of decommissioning operations"?

3. Is it also the Army position that the Commission should approve the five-year delay in the submission of a JPG DU site decommissioning plan even if the site characterization activities proposed in the Field Sampling Plan are not sufficient for the effective conduct of decommissioning of the JPG DU site beginning in 2011?

4. Is it also the Army position that the regulatory requirements that a JPG DU site decommissioning plan must meet are "irrelevant" for evaluating in this proceeding the adequacy for purposes of 10 CFR 40.42(g)(2) of the site characterization activities proposed in the FSP?

5. In the Army view, how would the Commission find whether the site characterization activities proposed in the FSP are necessary to the effective conduct of decommissioning operations" without reference to the regulatory requirements that a JPG DU site decommissioning plan must meet?

6. In the Army view, how would the Commission determine whether the site characterization activities proposed in the FSP are "otherwise in the public interest" without finding whether those activities would also be sufficient to support a JPG DU site decommissioning plan meeting the applicable regulatory requirements?

7. In the Army view, would approval of the FSP and alternate scheduled proposed by the Army be warranted even if the Commission found that the site characterization activities being proposed would not be sufficient to support submission of a JPG DU site decommissioning plan in 2011?

8. If so, why? If not, why not?

9. In the Army view, why would the approval of an alternate schedule which assured further delay beyond the additional five years being requested in this proceeding be "otherwise in the public interest"?

10. Is it the Army view that the decommissioning plan for which an alternate schedule is being sought in this proceeding would provide for license termination under restricted conditions?

11. If so, why? If not, why not?

12. Is it the Army view that a decommissioning plan which would provide for the restricted release of the JPG DU site would need to meet the requirements of 10 CFR 20.1403?

13. If so, why? If not, why not?

14. Is it the Army view that a decommissioning plan which would provide for the restricted release of the JPG DU site would require the preparation by the Staff of an Environmental Impact Statement (EIS) and Safety Evaluation Report (SER)?

15. If so, why? If not, why not?

16. Assuming that an EIS and an SER would be required, what would be the length of the time period the Army would expect to be used for evaluation purposes in each document?

17. Is it the Army view that a decommissioning plan which would provide for the restricted release of the JPG DU site would need to assess two future scenarios, one in which institutional controls endure and another in which they fail?

18. If so, why? If not, why not?

19. Is it the Army view that in an institutional control failure scenario for the JPG DU site, the dose assessment analysis would include an exposure determination for at least a resident farmer with the farmer resident on the DU Site itself and using its soil, ground and surface water resources for subsistence purposes?

20. If so, why? If not, why not?

21. Would there likely be alternative critical group/average member exposure determinations made in the institutional control failure scenario?

21. If not, why not? If so, what critical groups/average members would the additional exposure determinations likely involve?

22. In a scenario in which institutional controls are assumed, for what critical groups/average members would the Staff expect exposure determinations likely to be made? Which of these critical groups/average members would be considered most "conservative"?

23. Assuming that the site characterization activities proposed in the FSP would be found insufficient to meet the requirements for an application for license termination under restricted conditions of the JPG DU site, what would be the Army view as to the timing and means by which the additional activities required would be authorized and performed?

24. In the Army view, why would the separate means and later timing envisioned for the additional site characterization activities required for license termination be "otherwise in the public interest" when compared to the alternative preferred by STV of including and completing those additional activities in the FSP and by 2010?

B. FSP Addenda

1. Does the Army anticipate at this time that there will be future addenda to the FSP?

2. If not, why not? If so, what would be the anticipated purpose, scope and timing of those future addenda?

C. Public Meetings

1. Does the Army anticipate at this time that the Staff will convene future public meetings with respect to the FSP?

2. If not, why not? If so, what would be the anticipated purpose, scope and timing of those future meetings as the Army understands them?

D. Recent Fish and Wildlife Service Sampling Activities

1. Is the Army aware of the recent Fish and Wildlife Service sampling activities at JPG as reported in Dr. Henshel's surrebuttal testimony?

2. Does the Army agree generally with Dr. Henshel's description of those FWS sampling activities?

3. If not, how would the Army describe those activities?

3. Does the Army view the samples collected by FWS to have potential value for FSP purposes?

4. If not, why not? If so, how would the Army anticipate the value of the samples for FSP purposes could best be realized?

IV. STV Questions for Army Witness Skibinski

A. Definitions

1. Define the term “ground water” as it is used in your testimony.

2. As you define it, does “ground water” include all water below the surface of the earth?

3. If not, what water below the surface of the earth is excluded from your definition of “ground water”?

4. Is water flowing episodically through karst features such as sinkholes, tunnels and caves considered to be “ground water” according to your definition?

B. Karst Hydrogeology

1. As you understand the hydrogeology of the larger geographic area of southeastern Indiana in which the Jefferson Proving Ground is located, does that area include karst hydrogeology outside the boundaries of the Proving Ground?

2. Does that karst hydrogeology potentially include both “shallow” and “deep” levels?

3. If not, why not? If so, how do you define “shallow” and “deep”?

4. What elements of the FSP as currently designed will identify either or both “shallow” and “deep” karst in the vicinity but outside the boundaries of the Proving Ground? How?

5. Will these elements of the FSP as currently defined identify all significant karst features in the vicinity but outside the boundaries of the Proving Ground?

6. If not, why not? If so, how will the FSP as currently designed permit the Army and the Staff to be sure that they have identified all of the potentially significant karst hydrogeology outside JPG?

7. As you understand the hydrogeology of the Jefferson Proving Ground, is there karst hydrogeology within the boundaries of the Proving Ground?

8. Does that karst hydrogeology potentially include both “shallow” and “deep” levels?

9. If not, why not? If so, do you define “shallow” and “deep” the same within as outside JPG?

10. What elements of the FSP as currently designed will identify either or both “shallow” and “deep” karst within the boundaries of the Proving Ground? How?

11. Will these elements of the FSP as currently defined identify all significant karst features within the boundaries of the Proving Ground?

12. Were these elements able to identify independently all of the caves included in the Sheldon study?

13. If not, why not?

14. Does the karst hydrogeology within the boundaries of the Proving Ground extend into the Depleted Uranium test site?

15. Does that karst hydrogeology potentially include both “shallow” and “deep” levels?

16. If not, why not? If so, do you define “shallow” and deep” the same within as outside the DU area?

17. What elements of the FSP as currently designed will identify either or both “shallow” and “deep” karst within the boundaries of the DU test site?

18. Will these elements of the FSP as currently defined identify all significant karst features within the boundaries of the Proving Ground?

19. Were these elements able to identify independently all of the caves within the DU area which were included in the Sheldon study?

20. If not, why not?

21. Are there hydrogeologic interconnections known to convey water between the karst within and outside the Jefferson Proving Ground?

22. Are there hydrogeologic interconnections known to convey water between the karst within and outside the DU area?

23. Are those hydrogeologic interconnections potentially significant with respect to hydrologic flows within and outside the Jefferson Proving Ground?

24. Will the FSP as currently designed identify all of the actually significant hydrogeologic interconnections between the karst hydrogeology within the JPG DU site and the areas outside the DU site, both within and outside the JPG boundaries?

25. If not, why not? If so, how will the FSP permit the Army and the Staff to be sure that they have identified all of the actually significant hydrogeologic interconnections among the primary karst features within the JPG DU site and the areas outside the DU site, both within and outside the JPG boundaries?

26. The Army’s mapping techniques for karst features requires that the feature be expressed as a visible linear anomaly that can be seen on aerial photographs, don't they?

27. The near-surface cave systems that can be physically entered along Big Creek are not mapped by combining the results of the Army’s Fracture Trace Analysis and Electronic Imaging Survey, are they?

28. Those caves also do not have a surface expression that is visible on the aerial photographs employed by the Army, do they?

29. If the Army cannot map near-surface cave systems with its FSP methodology, upon what do you base your confidence that it can map cave systems at greater depths or in areas where they do not open to the surface?

30. If the Army cannot map cave systems with its FSP methodology, upon what do you base your confidence that your technological approach will identify and locate other karst features and interconnections?

31. Does karst hydrogeology present major challenges to modeling groundwater flows at site like JPG?

32. If not, why not? If so, how so?

33. Will it be necessary to supplement RESRAD with an additional model or models to address these challenges?

34. What additional model or models would SAIC consider most suitable to address these challenges?

35. Have the site-specific data needs of this model (these models) been taken into consideration in the FSP as currently designed?

36. If so, how? If not, how would SAIC propose to address these needs in the future?

C. Flooding

1. Is Jefferson Proving Ground, including the DU area, subject to periodic flooding?

2. Based on the prior studies of JPG which you have reviewed, how would you describe the frequency and severity of the flooding to which JPG, including the DU area, is subject?

3. Do these floods periodically raise the levels of surface streams traversing JPG and the DU area? By how much?

4. Do these floods also affect the karst hydrogeology within JPG, including the DU area? How?

5. Do these floods have the capacity to move DU penetrators, fragments, and particles from their previous resting places to other locations, including locations outside of the DU area and even outside of JPG?

D. UXO

1. Are you a graduate of the U.S. Naval School of Explosive Ordnance Detection (EOD) or any other school recognized by the U.S. Army Corps of Engineers Huntsville Engineering and Support Center for purposes of unexploded ordnance training?

2. As what “level” of UXO Specialist (UXO Technician I, II, III or Senior UXO Supervisor) are you qualified under the requirements of Department of Defense Explosive Safety Board

Technical Paper 18, “Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel” (December 20, 2004).

3. Are you in the US Army Corps of Engineers Huntsville Engineering and Support Center UXO Technician database?
4. If so, what is your reference number?

5. With respect to the Army's Field Sampling Plan, did you personally perform any investigatory or documentary activities pursuant to specific provisions of the document entitled “Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities” (EP 75-1-2, October 1, 2004)

6. If so, what activities pursuant to which provisions of EP 75-1-2?

7. Were the results of those activities documented in accordance with EP 75-1-2?

8. Is the documentation of those activities included in the Army’s prefiled testimony and exhibits in this case?

9. If so, which testimony and/or exhibits, specifically?

10. With respect to the Army's Field Sampling Plan, did you personally direct any other person to perform any investigatory or documentary activities pursuant to specific provisions of the document entitled “Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities” (EP 75-1-2, October 1, 2004)?

11. If so, what person (by name) with respect to what specific activities pursuant to which particular provisions of EP 75-1-2?

12. Were the results of those activities documented in accordance with EP 75-1-2?

13. Is the documentation of those activities included in the Army’s prefiled testimony and exhibits in this case?

14. If so, which testimony and/or exhibits, specifically?

V. STV Questions for Army Witness Eaby

A. Definitions

1. Define the term “ground water” as it is used in your testimony.

2. As you define it, does “ground water” include all water below the surface of the earth?

3. If not, what water below the surface of the earth is excluded from your definition of “ground water”?

4. Is water flowing episodically through karst features such as sinkholes, tunnels and caves considered to be “ground water” according to your definition?

B. UXO

1. Are you a graduate of the U.S. Naval School of Explosive Ordnance Detection (EOD) or any other school recognized by the U.S. Army Corps of Engineers Huntsville Engineering and Support Center for purposes of unexploded ordnance training?

2. As what "level" of UXO Specialist (UXO Technician I, II, III or Senior UXO Supervisor) are you qualified under the requirements of Department of Defense Explosive Safety Board Technical Paper 18, "Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel" (December 20, 2004)?

3. Are you in the US Army Corps of Engineers Huntsville Engineering and Support Center UXO Technician database?

4. If so, what is your reference number?

5. With respect to the Army's Field Sampling Plan, did you personally perform any investigatory or documentary activities pursuant to specific provisions of the document entitled "Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities" (EP 75-1-2, October 1, 2004)?

6. If so, what activities pursuant to which provisions of EP 75-1-2?

7. Were the results of those activities documented in accordance with EP 75-1-2?

8. Is the documentation of those activities included in the Army's prefiled testimony and exhibits in this case?

9. If so, which testimony and/or exhibits, specifically?

VI. STV Questions for Army Witness Anagnostopoulos

A. Sample Collection, Analysis and Interpretation

1. Despite all of their disagreements, the Army and STV seem to agree that a key issue is how to address the uncertainty inherent in sampling results when attempting to determine whether depleted uranium (DU) is present at low concentrations in particular field samples, is that correct?

2. However, from your testimony it would appear that you disagree with STV witness Norris that it is important for purposes of the Field Sampling Plan (FSP) to detect and measure the presence of DU at low concentrations, is that also correct?

3. Do you consider the purposes of the FSP to be the same as the Environmental Radiation Monitoring Program (ERMP)?

4. If yes, why? If no, why not?

5. But, is not the overriding purpose of the JPG site characterization program to determine whether DU is moving through the environment and, if so, in what forms, by what pathways, in what amounts, and at what rates?

6. If not, why not?

7. And, the purpose of the ERMP is to determine whether DU is present at particular times at particular locations in the environment at levels considered to be a potential threat to public health, is that correct?

8. If not, why not?

9. So, as you understand them, are the purposes of the ERMP and the FSP identical?

10. How would you define any differences in purpose between the ERMP and the FSP as you see them?

11. So, how would uncertainty in determining whether DU is present at low concentrations in particular samples affect the purpose of the FSP, as you understand it?

12. Assuming for the moment that it would be important for FSP purposes to reduce substantially the uncertainty inherent in samples which include DU at low concentrations, what change(s) in sample collection, analysis and interpretation from those used in the ERMP could be made to achieve that result for the FSP?

13. Would modifying in any respect the Alpha Spectroscopy (AS) methods currently being used in the ERMP help to achieve that result for the FSP?

14. If so, how? If not, why not?

15. Would supplementing Alpha Spectroscopy (AS) with Inductively Coupled Plasma Mass Spectrometry (ICP-MS) help to achieve that result for the FSP?

16. If so, how? If not, why not?

17. Is the Army planning an addendum to the FSP to address sample collection, analysis and interpretation methods?

18. When will that addendum be submitted to the Commission?

19. Why was that addendum not submitted earlier in the FSP development process?

20. What role have you played in the development of the planned addendum?

21. Has your role changed with respect to the development of the planned addendum now that you are no longer with SAIC?

22. If yes, who with SAIC has assumed the role you formerly played with respect to the development of the planned FSP addendum relating to sample collection, analysis and interpretation?

The Staff's Questions

Questions Propounded to Mr. Norris

A. Mr. Norris seems to have authored testimony that goes beyond his expertise as a hydrogeologist. Specifically, Mr. Norris has provided extensive testimony regarding analytical laboratory methods for detecting uranium and DU in samples.

1. Do you have any experience in radiochemistry?

2. Do you have any experience in radiological dose modeling?

3. Do you have any experience in interpreting alpha spectroscopy or mass spectroscopy sample data?

4. Please describe specifically your education, training, or experience providing your expertise to analyze samples for uranium or DU.

B. Mr. Norris' testimony is provided to support the STV position that "adequate" site characterization must be able to support direct, indirect, and cumulative environmental and public health impacts from both radioactivity and toxicity attributable to DU for at least 1,000 years. Norris Rebuttal at 39, Norris Sur-rebuttal at 9. If STV's reason for claiming that the FSP is inadequate is based on STV's perceived requirement for an ecological risk assessment type characterization of the JPG site, then STV is not necessarily arguing that the FSP is inadequate for NRC regulatory purposes because neither the NRC nor the Licensee needs to perform an ecological risk assessment in order to calculate the radiological dose to the public.

1. Do you agree that the site characterization must examine the chemical toxicity of DU?

2. Do you think it is within the requirements of 10 C.F.R. § 40.42(g)(2) and/or 10 C.F.R. Part 20, Subpart E "Radiological Criteria for License Termination" to examine toxicity? Why?

C. These questions relate to the Kd model, and the answers should illustrate that the use of the Kd model would result in conservative uranium transport estimates that are protective of human health from radiation from DU.

1. Basis “J” indicates that the Kd model should not be used because the local equilibrium assumption may not be valid. What harm do you expect to result from modeling uranium transport with the Kd model if the equilibrium assumption is not valid?

2. Basis “J” indicates that the Kd model should not be used because the sorbed and dissolved concentrations may not be linearly related. The Army has indicated in its FSP that it intends to measure sorption at a variety of uranium concentrations. Thus, the Army will be able to detect non-linear sorption using the methods described in the FSP. What inadequacy related to non-linear sorption do you see in the sorption measurements described in the FSP?

3. Your sur-rebuttal testimony suggests that the FSP is inadequate because it specifies that Kd values will be measured with samples of only the Cincinnati and Cobbsfork soil types, which together comprise 60% of the soil at JPG. The Cincinnati, Cobbsfork, Avonburg, Grayford, Rossmoyne, and Ryker soils, which together comprise 98% of the soil at JPG, are all classified as having a fine-silty soil texture (Well Location Selection Report (ML070220461) at pp. 2-2 to 2-3). Given that soil texture is a key factor in determining sorption, what impact to you think the 2% of soil that is not fine-silty soil will have on radionuclide transport at JPG?

D. The STV witnesses generally have over-emphasized matters that are not relevant to the regulation of this site. In his testimony (Norris Direct A.072, Norris Sur-rebuttal at 8), Mr. Norris specifically testifies that the analytical methods must identify the level of DU in the surface water to extremely low levels. These questions should demonstrate the insignificance of those low levels.

1. What is the approximate natural radiation exposure of humans in milirem per year (“mrem/yr”)? How does that compare to the 25 mrem/yr limit for the radiological dose to the public for decommissioning under restricted conditions?

2. What is the level of exposure you would expect to an offsite receptor if there is DU currently in the surface water at the detection limit of alpha spectroscopy? How do you calculate that exposure level?

3. How does that theoretical exposure compare to natural radiation exposure?

4. What is the detection limit of the method you propose?

5. What more will your proposed analytical method show that alpha spectroscopy does not show, and how is that information necessary for decommissioning purposes?

E. Mr. Norris has provided extensive testimony regarding the possibility of an extensive network of deep karst. Norris Rebuttal A.019. Mr. Norris relies on this assumption to raise the issue of transport of DU through a deeper karst system. To resolve this issue, it is important to identify the foundation for Mr. Norris' belief that there is a deeper karst network at the JPG site.

1. Have you observed any deep karst features at the JPG site?

2. Please provide details on why you believe there are deep karst features at the JPG site.

3. How does the geologic history of the JPG site support the development of deep karst features?

F. Mr. Norris has provided extensive testimony relying on a straw-man argument. He relies on the assumption that the future, undefined characterization methods at the site will be the same as the previous methods for work performed at JPG pursuant to the ERMP which had different Data Quality Objectives. Norris Direct at 70. It is important to explore how his testimony relying on this assumption is relevant to the FSP since the FSP addendum has not been submitted, and it will provide the essential details of the sampling procedures for surface water, groundwater, soil, and sediment along with the analytical methods for analysis.

1. Has your testimony regarding the methods used at the JPG site assumed that the FSP will use the same methods as used in the ERMP?

2. If yes, does that mean your testimony on this subject should be disregarded if the FSP addendum differs from the ERMP methods?

3. If no, please explain the basis for your testimony regarding sampling procedures and analyses.

G. Mr. Norris' testimony is provided to support the STV position that a sea change is needed for the FSP. Norris Rebuttal at 27. STV suggests that a bounding analysis for the peak offsite radiological dose is insufficient for decommissioning. This issue raised by his testimony directly relates to the purpose of the data gathered during the alternate schedule. Assuming that a bounding analysis for peak offsite radiological dose is appropriate for decommissioning, Mr. Norris does not testify that the FSP is inadequate to provide the data necessary to determine a bounding peak radiological dose to humans.

1. Why does the NRC Staff's practice of determining a bounding peak radiological dose not fulfill the regulatory requirements for decommissioning?

2. Is the FSP capable in your opinion of providing the data necessary for determining a bounding peak radiological dose to humans?

3. If not, what additional data is necessary for determining a bounding peak radiological dose?

H. Mr. Norris has testified that there is DU in the surface water at JPG, and specifically in Big Creek. He does not identify the specific samples that lead him to this conclusion. The Staff witnesses have been unable to directly rebut his testimony without knowing to which samples in particular Mr. Norris refers.

1. You have testified that DU has been detected in surface water at JPG. Please identify the surface water reports and sample IDs that support your claim.

2. For each of these samples, how do you reach the conclusion that DU has been detected?

3. Have you taken into account the uncertainties associated with the samples you rely on for this conclusion?

I. Regarding surface water sampling, Mr. Norris has testified that "the appropriate question is not whether the sample is natural uranium or is depleted uranium, but whether and how much DU is in the sample." Norris Sur-rebuttal at 10. Therefore, it is important to determine if it is even possible to measure the fraction of DU in a particular sample. Because DU and natural uranium will mix and interact in the environment, it is the Staff's position that it is impossible to determine whether the individual atoms of U-238 and U-234 in any particular sample come from natural uranium or from DU. Rather, the ratio of the two isotopes is used to determine if a sample indicates the presence of DU.

1. How do you measure the fraction of DU that is present in a particular sample?

2. Is it your position that DU does or does not interact with natural uranium as it migrates through the environment?

3. If DU does interact with the natural uranium as it migrates through the environment as the Staff's position suggests, how can natural uranium and DU maintain their individual isotopic ratios so that a percentage of DU in a sample can be determined as you contend in your testimony?

Questions Propounded to Dr. Henshel

A. Dr. Henshel seems to have authored testimony that goes beyond her expertise as a toxicologist. Specifically, Dr. Henshel has provided extensive testimony regarding analytical laboratory analysis for uranium and DU levels in samples.

1. Do you have any experience in radiochemistry?

2. Do you have any experience in radiological dose modeling?

3. Do you have any experience in interpreting alpha spectroscopy or mass spectroscopy sample data?

4. Please describe specifically your education, training, or experience providing your expertise to analyze samples for uranium or DU.

B. The STV witnesses generally have over-emphasized matters that are not relevant to the regulation of this site. In her testimony (Henshel Sur-rebuttal at 6), Dr. Henshel specifically argues that DU may be migrating offsite in extremely small quantities, but that these quantities may have significant impacts. These questions should identify the basis for her arguments and demonstrate the insignificance of those low levels.

1. What scientific studies, tests, or reports support your contention that DU may be migrating offsite?

2. What is the approximate natural radiation exposure of humans in mrem/yr? How does that compare to the 25 mrem/yr limit for the radiological dose to the public for decommissioning under restricted conditions?

3. What is the level of exposure you would expect to an offsite receptor if there is DU currently in the surface water at the detection limit of alpha spectroscopy? How do you calculate that exposure level?

4. How does that theoretical exposure compare to natural radiation exposure?

C. Dr. Henshel has testified that there is DU in the deer at JPG. She does not identify the specific samples that lead her to this conclusion. The Staff witnesses have been unable to directly rebut her testimony without knowing to which samples in particular Dr. Henshel refers.

1. You have testified that DU has been detected in deer at JPG. Please identify the reports and deer sample IDs that support your claim.

2. For each of these samples, how do you reach the conclusion that DU has been detected?

3. Have you taken into account the uncertainties associated with the samples you rely on for this conclusion?

Questions Propounded to Joseph Skibinski

A. The analytical methods for examining samples for uranium and DU will likely follow the accepted standardized methods in MARLAP that have been adopted by eight Federal agencies.

If the Army plans to follow the methods in MARLAP, uncertified and untested alternate methods proposed by STV should not be needed.

1. Will you follow the principles given in MARLAP to develop the Data Quality Objectives for the sampling that will commence in 2008?

Questions Propounded to Mr. Eaby

A. These questions should provide clarification for the basis of the current hydrogeological Conceptual Site Model ("CSM") that evidence of significant deep karst networks does not exist at the JPG site.

1. Please describe your current hydrogeological CSM.

2. Have you observed shallow karst features, that is those above the lower bedrock, at the site? Please describe some.

3. Have you observed any evidence of deep karst features at the site? Please explain.

4. Please provide a description of the well logs and core samples from the monitoring wells installed at the site this past spring.

5. Based upon your own experience and based on your direct observations at the site, do you believe that there is a network of deep karst as described by Mr. Norris? Please explain.

EXHIBIT A
TO
U.S. ARMY'S PROPOSED QUESTIONS

Proposed Questions for the Board to Consider for Propounding to the Persons Sponsoring the Testimony

1. **To STV's Witness Charles Norris:**

   Written testimony provided by STV asserts that "...it is necessary for the FSP's sampling procedures to be able to detect and map the mobility in the environment of DU at low concentrations..." Please specify the numerical value of the "low" concentration that must be detected and provide a technical basis for that value.

2. **To STV's Witnesses Dr. Diane Henshel and Charles Norris:**

   STV states that DU is leaving the JPG site "...atom by atom, molecule by molecule." Since DU is not more hazardous than natural uranium and since natural uranium is ubiquitous on and in the earth and certainly leaving the JPG site as well, please describe the potential health impact of these molecules leaving the site and how they compare to the NRC-governed regulations for license terminations.

3. **To STV's Witness Charles Norris:**

   Written testimony provided by STV stated that "...the FSP must be able to support complete, detailed site sampling and modeling and not merely bounded peak dose calculations in order to be 'adequate' for its intended purpose." Please explain why modeling "bounded peak dose calculations" for average members of the critical group as required by NRC regulations is not adequate.

4. **To STV's Witness Dr. Diane Henshel:**

   Written testimony provided by STV stated that "...adequate site characterization must be able to support not only peak radiation dose calculations to humans in the near term, but also direct, indirect, and cumulative public health and environmental impacts from both radioactivity and toxicity attributable to JPG DU for at least 1,000 years." Please specify the NRC-governed regulations for license terminations that require an assessment of the cumulative public health impacts and toxicity of uranium.

5. **To STV's Witness Dr. Diane Henshel:**

   Written testimony provided by STV stated that "...In fact, these workers (federally employed workers) do indeed spend an entire working year in or near the controlled burn areas at JPG..." What information did you base this statement on, and how did you obtain this information? Did the subsequent conversation with Dr. Robb cause you to formulate a new estimate? What is that estimate based upon?

6. **To STV's Witness Charles Norris:**

   Written testimony provided by STV stated that "...the analysis technique they are using, alpha spectroscopy (AS), is simply incapable of ever identifying such samples because of the uncertainties inherent in that procedure, as performed using standard procedures at commercial laboratories..." Please explain why the FSP is inadequate when existing methods readily identify the presence of DU when it is present at levels in excess of the total uranium in the natural background. For example, DU was easily detected during a characterization effort by SEG at nearly 30 pCi/L in SW-DU-005 in 1999 using gamma

spectroscopy. In this case, the uranium in that sample represented only 20% of the action level for uranium in water at the JPG under the ERM program plan.

7. **To STV's Witness Dr. Diane Henshel:**

Based on STV's testimony, rebuttal testimony, and sur-rebuttal testimony, STV acknowledges few, if any, beneficial aspects to the design of the FSP and any of the FSP data collected to date. In your opinion, are there any beneficial aspects to the FSP and associated data? If yes, please state the major beneficial aspects and why they are beneficial.

8. **To STV's Witness Dr. Diane Henshel:**

In A.16 of your sur-rebuttal, you seem to suggest that if DU were not present in a sample, then all isotopes of uranium should be at non-detect values. Stated another way, the detection of any uranium isotopes indicates the presence of DU. Is this your contention?

9. **To STV's Witness James Pastorick:**

Please identify each area within or immediately surrounding the DU impact area that is known not to contain MEC (munitions and explosives of concern).

10. **To STV's Witness James Pastorick:**

Other than your opinion, found in your Answer 10 on page 10 of your testimony, that Mr. Eaby's statement concerning changing the drilling method "following additional consideration", do you have any evidence that Army/SAIC failed to properly evaluate the UXO hazard at the DU area of JPG?

11. **To STV's Witness James Pastorick:**

Please identify each of the specific safety procedures listed in Engineering Pamphlet (EP) 75-1-2, *Unexploded Ordnance (UXO) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities* (August 1, 2004) which should have been previously implemented by the Army/SAIC at JPG and which to your knowledge have not been implemented at JPG.

12. **To STV's Witness James Pastorick:**

Is it a fair synopsis of your testimony that a UXO expert helps to assess the risk and to advise as to the safety procedures to be implemented in obtaining data for site characterization purposes, but that the judgment as to whether any certain characterization activity is needed or necessary is left to other scientific disciplines and to the requirements of the NRC regulations?

13. **To STV's Witness James Pastorick:**

Do you agree that cost, potential delay and the need (or necessity) for performing a given site characterization task in a certain way are each legitimate factors for consideration in determining what activities need to be performed in areas containing UXO?

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
U.S. ARMY	)	Docket No. 40-8838-MLA
	)	
	)	
	)	
(Jefferson Proving Ground)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LB NOTICE (INCLUSION OF PARTIES' PROPOSED QUESTIONS INTO HEARING RECORD) have been served upon the following persons by U.S. mail, first class, or through internal NRC distribution.

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Office of the Secretary of the Commission

Dated at Rockville, Maryland,
this 28th day of February 2008