TechLaw
Quality & Integrity

March 16, 2006

Mr. David Cobrain
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505-6303

Reference: Work Assignment No. 06110.290; State of New Mexico Environment
             Department, Santa Fe, New Mexico; Human Health and Ecological Risk
             Assessment Support; Closure Certification Report McGregor Range Open
             Detonation (OD) Unit, Fort Bliss, New Mexico, Task 3 Deliverable.

Dear Mr. Cobrain:

Attached please find a deliverable for the above-referenced work assignment. The deliverable
addresses the review of the risk assessment for the "Closure Certification Report McGregor Range
Open Detonation (OD) Unit, Fort Bliss, New Mexico."

As noted in the task order memo, Ms. Diaz indicated that the review should focus on any
statistical analysis relevant to the area. As such, TechLaw conducted a review of the calculations
of the 95 percent upper confidence level (95% UCL) for background metals provided in
Appendix E. This review consisted of inputting the background data provided in the Appendix
into the Environmental Protection Agency's (EPA) ProUCL software (version 3.00.02).
Comments concerning this analysis have been provided in the attached deliverable.

The report is dated December 2005; however, New Mexico soil screening levels (SSLs) from
2004 were used for comparison purposes. It is not clear why the August 2005 SSLs were not
used. For purposes of this review, the most recent (2006) SSLs were used for comparison
against the site data. With the exception of arsenic, all the organic and inorganic chemicals had
maximum detected concentrations less than the most recent 2006 SSLs. New Mexico SSLs were
not available for dioxins, therefore Environmental Protection Agency (EPA) Region 6 screening
levels for dioxin (2,3,7,8-TCDD) was used. It should be noted that the Region 6 screening level
for dioxin as presented in Table 2-3 of the report is based upon a risk level of 1E-06. As New
Mexico enforces a target risk level of 1E-05 for clean closure, the analysis of dioxins as
presented in the report is conservative. A comment has been drafted concerning this issue.

The primary concern at the site is potential for elevated levels of arsenic. All other constituents were either within background levels or below the residential SSLs. The characterization data showed three areas in particular with elevated levels of arsenic, with sample location 25 being the highest detect (20.3 mg/kg). Additional sampling was conducted to confirm hot spots and removal of soil was conducted in three areas. However, as the additional sampling did not confirm the hot spot at sample location 25, soil removal was not conducted at that location. Upon completion of the soil removal, additional samples were collected, and used to re-calculate the exposure point concentration (95% UCL) for arsenic. The resulting 95% UCL was still slightly above the background 95% UCL determined for the site, but below the residential SSL. However, permit Attachment F clearly indicates that background was to be used as the cleanup criterion and not the SSL. Therefore, a comment has been drafted requesting a site attribution analysis be conducted to demonstrate that the site data concentrations do not differ significantly from background. NMED may wish to consider the inclusion of this comment, as there was little difference between the site UCL and the background UCL, and the comment may be deemed to conservative.

Overall the report was a little difficult to follow and was disorganized. A general comment has been drafted requesting that a summary table with data statistic be provided.

This deliverable was emailed to you on March 16, 2006 at David.Cobrain@state.nm.us to Ms. Tammy Diaz at Tammy.Diaz@state.nm.us. A formalized hard (paper) copy of this letter deliverable will be sent via mail. If you have any questions, please call me at (303) 763-7188 or Ms. Paige Walton at (801) 451-2978.

Sincerely,
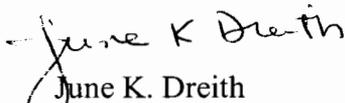
June K. Dreith
Program Manager

Enclosure
cc: Tammy Diaz, NMED
       Ms. Paige Walton, TechLaw

TASK 3 DELIVERABLE

REVIEW OF THE CLOSURE CERTIFICATION REPORT
MCGREGOR RANGE OPEN DETONATION (OD) UNIT,
FORT BLISS, NEW MEXICO

Human Health and Ecological Risk Assessment Support

Submitted by:

TechLaw, Inc.
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Golden, CO 80401-9532

Submitted to:

Mr. David Cobrain
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Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505

In response to:

Work Assignment No. 06110.290

March 16, 2006

REVIEW OF THE CLOSURE CERTIFICATION REPORT
MCGREGOR RANGE OPEN DETONATION (OD) UNIT,
FORT BLISS, NEW MEXICO

GENERAL COMMENTS

1. The data presentation in the report does not allow the reader to have a good understanding of the analytical results. A summary table with appropriate data statistics, including the minimum, maximum, mean, and 95 percent upper confidence limit of the mean (95% UCL) should be provided. Please provide a data summary table (for all constituents) that includes this information.

2. The report applies the New Mexico residential soil screening level (SSL) for arsenic for comparison as to whether the site meets the criteria for clean closure. However, as noted in Permit Attachment F, Closure Plan, the cleanup level for arsenic that should be used for determining whether remedial actions/decontamination are necessary is the background level of arsenic, not the SSL. Therefore, while comparison to the SSL is acceptable, the final conclusion as to whether the site requires additional remediation or if the site is ready for clean closure should be made through a comparison to background screening level. The maximum detected concentration for arsenic (20.3 mg/kg) was above both the residential SSL and the background 95% UCL. Thus, a 95% UCL for arsenic was calculated to be 4.83 mg/kg (presented in Table 2-5). Due to some areas of elevated concentrations, some hot spot removal was conducted. Upon completion of the removal of soil with elevated levels of arsenic, confirmation sampling was conducted and a new site 95% UCL for arsenic was calculated. However, the 95% UCL (3.66 mg/kg) for arsenic still slightly exceeds the criterion for residential release (background value of 3.38 mg/kg). It is suggested that a site attribution analysis be conducted using a nonparametric comparison of the background reference area data set and the site data set (e.g., Wilcoxon Rank Sum (WRS) test), using the confirmation sample results. If the results of the site attribution analysis indicate that the characterization data is significantly different from background, other analyses, such as histograms, box and whisker plots, and/or geochemical plots, may be warranted. It should be noted that regional concentrations are not sufficient for use in eliminating a chemical as a constituent of concern. Revise the report to provide additional justification that arsenic is not present at levels significantly different from background.

SPECIFIC COMMENTS

1. **Section 2.6.1, Evaluation Methods, page 2-6.** The last paragraph in this section indicates that site characterization results were compared to the SSLs to evaluate significance and overall human health risk. However, the text does not discuss how the site data were to be compared to the SSLs. For example, was the maximum detected site concentration used or the 95% UCL? Typically for a screening assessment, the maximum site concentration is compared to the SSL. In the event that the screening results in acceptable risk, then additional analysis may be warranted. Please clarify how it was determined whether site data meet the release criteria (SSLs). In addition, please provide a table that clearly shows what

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site data were used to compare to the SSLs and include the corresponding risk/hazard levels.

2. **Section 2.6.3, Background Calculations, page 2-7.** Background soil samples were analyzed for explosive compounds as well as eight (8) RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). It is not clear why the background samples were analyzed for these 8 specific RCRA metals. First, Permit Attachment F, Closure Plan, page 10 of 17, indicates that background soil samples will only be analyzed for explosives and arsenic. Therefore, the analysis for metals other than arsenic was not required. Second, if additional analyses were to be conducted, it is not clear why only these metals were included in the analysis and not all metals that were being sampled for in the detonation unit. It seems reasonable to conclude that the metals included in the analysis were the result of a laboratory "packaging" of analytes. Please clarify whether the suite of 8 metals is just a result of a laboratory package or if there was some rationale behind the additional analysis of background metals other than arsenic.

3. **Table 2-3, Summary of Dioxin/Furan Detections.** Environmental Protection Agency (EPA) toxicity equivalency factors (TEFs) from EPA 1989 were applied. First, this reference was not provided in the reference list in Section 6. Please revise the reference list for completeness. Second, the TEFs for dioxin/furans have subsequently been updated as summarized in the World Health Organizations (WHO) "Toxicity Equivalency Factors (TEFs) for Dioxin-like Compounds for Humans and Wildlife" (June 1997, http://www.dioxinfacts.org/dioxin_health/dioxin_tissues/dioxin_toxicity.html). These 1997 values were used in reviewing the TEFs presented in the table. The following discrepancies were noted:

Dioxin/Furan Isomer	1989 EPA TEF	1997 WHO TEF
1,2,3,7,8-PeCDD	0.5	1
1,2,3,4,6,7,8,9-OCDD	0.001	0.0001
1,2,3,4,6,7,8,9-OCDF	0.001	0.0001

In reviewing the driving isomers for the data, it appears that in most cases, 1,2,3,4,6,7,8,9-OCDD and 1,2,3,4,6,7,8,9-OCDF contributed the most to the total toxicity equivalency (TEQ) that was compared to the Region 6 SSL. As such, the TEFs applied, which are more conservative than the WHO TEFs for these two isomers, results in a more conservative estimation of TEQ. Therefore, while the most recent TEFs were not applied, the use of the 1989 TEFs does not appear to greatly impact the assessment for closure. No modifications to the tables are required concerning the TEFs.

However, a second comment concerning Table 2-3 is that the EPA Region 6 screening level for dioxin (2,3,7,8-TCDD) was used. It should be noted that the Region 6 screening level for dioxin as presented in Table 2-3 of the report is based upon a risk level of 1E-06. As New Mexico enforces a target risk level of 1E-05 for clean closure, (resulting SSL is 39 pg/g) the analysis of dioxins as presented in the report is conservative. When the above modifications to the TEFs and the SSL for 2,3,7,8-TCDD based on a 1E-05 risk are applied, all of the site dioxin/furan data are below acceptable limits for clean closure. No modifications to the repot concerning this issue are required.

4. **Table 2-5, 95% UCL for Arsenic.** It is noted that when a duplicate is available, both the sample and the duplicate sample were used in determining the UCL. Typically, either the maximum concentration or the average of the two samples is used to represent the sample location, but both samples are not applied. Please clarify whether including both the sample and the duplicate represents and over- or under-estimation of the UCL.

5. **Appendix E, 95% UCL Calculation for Mercury.** The table for the calculation of the 95% UCL indicates that a normal distribution was assumed and that the Students T test was applied. However, when ProUCL (version 3.00.02) was applied to the data in the table, the model indicated that the data were not normally distributed (using both the Shapiro-Wilk test and the Liliefors test, 0.05 confidence). ProUCL indicated that the dataset was actually a lognormal distributed and that a lognormal test should be used in determining the 95% UCL. When using the lognormal test, the 95% UCL was calculated as 0.0127 mg/kg. It is noted that the difference between the normal and lognormal 95% UCL is not significant and therefore has no impact on the comparison of site data to the background concentrations. However, the correct distribution should be applied. Please modify accordingly.

6. **Appendix E, 95% UCL Calculation for Selenium.** The table for the calculation of the 95% UCL indicates that a normal distribution was applied for selenium. However, when ProUCL was run, the results of the distribution analysis indicated that the data are non-parametrically distributed. However, when the 95% UCL calculation, the model indicated that there were insufficient unique observations to derive an accurate bootstrap estimate and that it recommended that either the Students T or modified T test should be applied. The result of the 95% UCL using the modified T test was 0.5077 mg/kg. As there is not a significant difference between the Students T and modified T test results, and the Students T was applied, no modifications to the methodology must be provided. However, the report should discuss the above, as it is misleading to indicate that the data were normally distributed. Please revise the report to include a discussion of the distribution of the dataset for selenium and why the 95% UCL was estimated using a normal distribution.

7. **Appendix E, 95% UCL Calculation for Silver.** The table for the calculation of the 95% UCL indicates that a normal distribution was applied for silver. However, all of the data points in the data set are identical, and therefore there is no variation in the dataset. Therefore, the 95% UCL is meaningless. It is unclear how the Students T test was applied to a dataset with no variation. When ProUCL was run using this dataset, the model indicated that there was insufficient variation. Please clarify how the 95% UCL was determined, and more importantly, why a 95% UCL was identified.