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September 2, 2010

DCN: NMED-2010-27

Mr. David Cobrain
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Dr. East
Building One
Santa Fe, NM 87505

RE: Re-evaluation of Draft Technical Review Comments on the *Final Basewide Background Study Report, Revision 1, Holloman Air Force Base, New Mexico*, October 2009

Dear Mr. Cobrain:

On May 28, 2010, we submitted a deliverable to you that consisted of draft technical review comments on the *Final Basewide Background Study Report, Revision 1, Holloman Air Force Base, New Mexico* dated October 2009 along with an evaluation of responses to Notice of Deficiency comments (Attachment 2 of the above referenced report). By request of Mr. James Bearzi, we have re-evaluated the technical review comments and divided them into two categories: Major and Minor. The Major Comments includes those comments that have an immediate impact on assessing the integrity and usefulness of the background data. Major comments specific to the radiochemical evaluation were provided separately, as these comments will require more effort to address. These comments require a response from the facility before the background data may be used. The second group of comments, Minor Comments, has less of an impact on the assessment of data. For these comments, it is recognized that a correction and/or response would not change the overall conclusion of data usability. Most of these comments include direction for how data should be evaluated for future reports.

In the May deliverable, all of the facility responses to previous NMED comments were deemed adequate with the exception of Comment Nos. 5, 6, 19, 21. Upon further review of these four issues the most important issues to address are Comment Nos. 5 and 6. These comments addressed the use of a method detection limit (MDL) as the background reference datum in the event that 100% of the data were non-detect and setting the upper tolerance level (UTL) at the MDL is 100% of the data were non-detect. It is understood from past comments that use of this value (MDL) was per NMED direction. Based upon the information provided in the original response from the facility along with the guidelines from the Environmental Protection Agency's Office of Resource, Conservation and Recovery (EPA ORCR), the trend by regulatory agencies is the use of a Practical Quantitation Limit (PQL) rather than a MDL. The PQL is deemed a technically defensible value, unlike the MDL which is not deemed as technically defensible. It is suggested that NMED reevaluate their position and consider applying the PQL as the background datum for data where 100% of the measurements in the dataset were non-detects.

A general concern with the data validation as applied to determination of background is that the same methodology will be applied for individual site investigations. As there were several issues noted with the data validation process applied in this report, and in order to ensure consistency with future evaluations, additional clarification has been requested. Of specific concern is the radiochemistry. There appeared to be a significant amount of analytical and validation issues that must be resolved prior to application of the same techniques against site investigation data.

It is understood that the facility has begun the corrective action process at several sites and continued progress is being delayed pending the approval of this background report. All of the attached major comments concerning inorganic and organic chemicals may be addressed fairly quickly and resolution of these issues does not appear to result in rejection of data. The radiochemistry issues are slightly more complex, but may be resolved with additional clarification, although some rejected data may result.

If you or any of your staff have questions, please contact me at (801) 451-2864 or via email at paigewalton@msn.com.

Thank you,

Paige Walton

Paige Walton
AQS Senior Scientist and Program Manager

Enclosure

cc: James Bearzi, AQS (electronic)
Joel Workman, AQS (electronic)
Paul Ellingson, AQS (electronic)

Draft Technical Review Comments on the
Final Basewide Background Study Report, Revision 1
Holloman Air Force Base, New Mexico
October 2009

Major Comments - General

1. Section 5.2, Determination of Number of Samples. The first paragraph indicates that subsurface samples were collected from six inches bgs to above the saturated zone. However, this is not consistent with the text provided in Section 3.1.2.3, which indicates that no samples were collected between six inches bgs and seven feet bgs. Clarify this discrepancy and clarify the depths at which subsurface soil samples were collected.

2. Section 5.6.1, Descriptive Summary Statistics. The calculation of the upper tolerance levels (UTLs) was based upon 2002 Environmental Protection Agency (EPA) guidance and applied an assumption of normality even though it is acknowledge that the data may not be normally distributed. The EPA (2002) guidance included distributional tests for two distributions: normal and log normal. However, subsequent to this 2002 publication, there have been updates to the methodology for determining UTLs, as outlined in the ProUCL User's Guide contained in Appendix D of this report. The currently accepted methodology for determining UTLs is to apply specific parametric or nonparametric distributional testing. ProUCL version 4.0 contains 5 parametric and 10 nonparmetric tests depending on the type of distribution. It is not clear why a more recent guidance was not consulted for determination of the UTL using distribution-based statistics was not applied. Even the EPA (2002) documents states that, "Before an appropriate method can be selected the site data must be characterized through exploratory analysis. Fitting distributions to the data is a crucial part of the exploratory data analysis." Forcing an assumption of normality could result in skewed UTLs. The use of UTLs based on improper tests is not acceptable. Revise the calculations of the UTLs to reflect current guidance and methodologies.

3. Section 5.6.3, Data Sets That Contain Non-Detects. When the number of non-detects were 15% or fewer, simple substitution methods were applied. For data with non-detects beween 15% and 50%, the Cohen method, which is a maximum likelihood estimate (MLE) was applied. However, per the ProUCL User's Guide, "*It should be noted that for data sets with NDs [non-detects], the DL/2 substitution method has been incorporated in ProUCL 4.0 only for historical reasons and also for its current default use. It is well known that the DL/2 [detection limit] method (with NDs replaced by DL/2) does not perform well (e.g., Singh, Maichle, and Lee (EPA, 2006)) even when the percentage of NDs is only 5%-10%. It is strongly suggested to avoid the use of DL/2 method for estimation and hypothesis testing approaches used in various environmental applications. Also, when the % of NDs becomes high (e.g., > 40%-50%), it is suggested to avoid the use of parametric MLE methods. For data sets with high percentage of NDs (e.g., > 40%), the distributional assumptions needed to use parametric methods are hard to verify; and those parametric MLE methods may yield unstable results.*" Use of simple substitution may also result in an underestimation of the UTL. In lieu of the proposed methods applied in this report, ProUCL provides several other methods for handling censored data to include regression on order statistics (ROS). As the use of simple substitution (<15% ND) or MLE (15-50% ND) tests for censored data are not a currently accepted practice, determination of the UTL for censored data sets should be revised to reflect current guidance. Revise accordingly.

4. Section 5.8.3, Transformation. It appears that all of the data were transformed to a lognormal distribution. It is not clear whether MLE methods were applied to log transformed data. While the use of the MLE method is not recommended (see Specific Comment No. 3), ProUCL also states, "*It should also be noted that even though the lognormal distribution and some statistics based upon lognormal assumption (e.g., Robust ROS, DL/2 method) are available in ProUCL 4.0, ProUCL 4.0 does not compute MLEs of mean and sd based upon a lognormal distribution. The main reason is that the estimates need to be computed in the original scale via back-transformation (Shaarawi, 1989, Singh, Maichle, and Lee (EPA 2006)). Those back-transformed estimates often suffer from an unknown amount of significant bias. Hence, it is also suggested to avoid the use of a lognormal distribution to compute MLEs of mean and sd, and associated upper limits, especially UCLs based upon those MLEs obtained using a lognormal distribution.*" Clarify whether MLE tests (e.g., Cohen's method) were applied to log transformed data.

5. Table 5-1. It appears that the estimated sample size was determined using the equation provided in Section 5.2 of the report, modified to reflect the calculated standard deviation obtained from the sample results. It is noted that for several constituents, an insufficient number of samples were collected. For example, in Table 5-1, due to the high standard deviation, the conclusion was that an insufficient number of samples were collected. In reviewing the box plot, histogram, and probability plot for lead, the data appear to be skewed and with a large spread. This seems to be indicative that the data do not represent a single distribution and that combining the data into a single background reference datum may not be appropriate. Further, the text does not appear to contain any discussion of the results presented in Table 5-1 concerning sample size and whether collection of additional data or splitting data into multiple background zones may be appropriate. In addition, the text in Section 5.2 indicates that forcing an assumption of normality onto the dataset may result in incorrect or misleading results. First, discuss why other methods for estimating sample size using tests not reliant on an assumption of normality were not applied. Second, it is understood that some of these data were removed from the dataset as being outliers. However, it is not clear that once the outliers were removed, if the resulting dataset (Tables 5-12 through 5-14 for soil) contains a sufficient number of samples. Provide this analysis.

6. In several cases, the laboratory used "truncation" to limit the effect of poor carrier or tracer recovery. A detailed explanation of this procedure describing its effects and supporting references for its use must be provided as part of the validation corrective action process. Provide an explanation to include details on the extent to which this technique corrects for poor recoveries and the conditions or uncertainties introduced by poor recoveries which are not corrected by truncation, as well as any effects due to truncation itself.

7. A quality control (QC) review was conducted to verify the accuracy of data validator's comments and qualifiers documented in the Data Validation Summary Reports (DVSRs). For SDG #D8I060136, Method 6010B, Sample BWBG-SB03-30, the results noted on the DVSR for total copper and total magnesium do not match the results given in the data package. Please review and clarify/correct as needed.

8. Appendices E –Histograms, F – Box Plots, and G – Normal Probability Plots. There were several instances where there was skewness in the histogram coupled with the large spreads and/or small lower quartiles in the box plot and the lack of correlation (horizontal, heavy tails, etc.) in the Q-Q plot suggesting that the data for the metal may not be representative of a single distribution or population. In addition, when looking at the statistical data for these metals, invariably the

standard deviation appeared to be fairly high. These facts question whether the data should be combined into a single background datum or whether multiple background reference values may be more appropriate. Address these issues for the following metals:

a. Arsenic: surface soil (small quartile in box plot)
b. Arsenic: subsurface soil (small quartile in box plot, skewed histogram)
c. Arsenic: saturated soil (small quartile in box plot, skewed histogram)
d. Cadmium: subsurface soil (skewed histogram)
e. Cadmium: saturated subsurface soil (skewed histogram, horizontal Q-Q plot with potential outliers)
f. Lead: surface soil (large spread in box plot, skewed histogram, and horizontal Q-Q plot)
g. Mercury: surface soil (skewed histogram)
h. Mercury: saturated subsurface soil (horizontal Q-Q plot)
i. Sodium: surface soil (skewed histogram, heavy tail on Q-Q plot)
j. Carbon-14: surface soil (disconnected histogram, unusually Q-Q plot)
k. Carbon-14: subsurface soil (no maximum whisker on box plot, skewed histogram, no correlation on Q-Q plot)
l. Carbon-14: saturated subsurface soil (skewed histogram, no correlation on Q-Q plot)
m. Lead-210: saturated subsurface soil (horizontal Q-Q plot)
n. Radium-228: saturated subsurface soil (horizontal Q-Q plot)

Major Comments - Radiochemistry

1. Matrix spikes (MS) were not reviewed in accordance with the *Evaluation of Radiochemical Data Usability* (U.S. Department of Energy [DOE], April 1997) (ERDU), which provides for the statistical evaluation of the significance of anomalous MS results. The review standard applied is not clearly stated nor does it appear to conform with the National Functional Guidelines. For instance, in aqueous samples the carbon-14 (C-14) MS was recovered below the lower acceptance limit, and the precision for the MS/MS Duplicate (MSD) pair was also out of limits. The laboratory notes in non-conformance No. 06-0120707 that the cause is "possible matrix effects" and that no corrective action was taken in the laboratory. Application of the "Test for matrix-induced bias" found at Section 5 E 5 (page 32 of 41) of ERDU for sample SS61-MW01 as part of this oversight review produced a result of 3.6, which per ERDU would result in consideration of the "R" flag. Considering the low recovery of the spike, the failure of the relative percent difference (RPD), and the non-detect status of the associated results, a minimum the "UJ" data qualifier was required, and that the "R" qualifier should, at a minimum, have been discussed and either applied, or a rationale for non-application presented. In fact the DVR indicates that the issue was noted, but states that because the Laboratory Control Sample (LCS) was in control no data qualification was necessary. The normal interpretation of this situation is that the data identify a matrix effect, as the laboratory concluded. Provide additional information to include: 1) A clearly stated and developed MS/MSD review standard; 2) Reassess all results associated with an MS or MSD result outside of laboratory limits; and 3) Either a scientifically defensible rationale for the use of data associated with out of control MS, MSD or RPD results should be presented.

2. There were several matrix issues noted for lead-210 (Pb-210) aqueous samples. A series of non-conformance reports in the laboratory report indicated that undissolved matter remained in sample preparations and that carrier recoveries were low. The laboratory effected corrective actions by repeating the preparation of the samples using reduced sample volume. For some samples this was

effective, and for others the preparations were repeated again using even less sample. The amount of sample used is not documented. In the end, the laboratory indicates that a matrix effect is still present, even after repeat analysis, and that it may be causing a low bias. The laboratory "truncated yields at 100%" to minimize or eliminate the low bias (stated as "minimize" in one non-conformance and as "eliminate" in another non-conformance). The DVR deals with the resulting increase in MDA (detection limits), but does not address the potential for low bias or the validity and impact of the "truncation" procedure, noting only that "Sample results were corrected for carrier recovery and/or re-extracted and compared to LCS recoveries. Therefore, no qualification was required." Additionally, for some samples, the LCS was out of control as well (high). This is noted properly in the DVR, and typically a high bias with non-detect sample results is a valid result, but there is no consideration of the combined impact of multiple data quality indicator failures anywhere in the DVR. Ultimately, no reasonable rationale for acceptance of the data subject to matrix-effect is presented. This situation leaves the question of whether this method is suitable for the subject samples, and whether there are serious issues of laboratory performance unanswered. Revise the DVR and at a minimum, discuss these issues and provide an assessment of their impact to the results and data usability. A scientifically defensible rationale for the use of these data should be presented.

3. Numerous issues affected Pb-210 analysis in soils, resulting in several non-conformance reports with limited corrective action in the laboratory. Affected samples vary, but the following issues were noted:

   a. For one sample, BWBG-SB20-40 the LCS was high, the MS was high. The DVR properly identified this sample and reasonably determined that since bias was high and the sample was a non-detect, no qualification was necessary.
   b. For 13 samples, the MS and MSD were low and the laboratory noted, "physical evidence of matrix interference."
   c. For 17 samples, the laboratory noted that the carrier recovery was high which could lead to low bias, and "physical evidence of matrix interference" was present. Yields were truncated.
   d. For 13 samples the LCS carrier yield was out of limits.

   These conditions are noted to some extent variously in the matrix spike section and the reporting limits section of the DVR, but in each case it was concluded that because the LCS was within limits, no data qualification was necessary. There was no detailed identification of the issues, no consideration of their magnitude, no consideration of the effect of multiple failures on the same samples, and "Physical evidence of matrix interference" was not acknowledged in the DVR. The DVR does not engage in any meaningful evaluation or discussion and provides no meaningful rationale for acceptance of these data nor were the data assessed in accordance with ERDU. The overall result of the review is that matrix interference was clearly and unambiguously established for this method and matrix resulting in a low bias for many samples and that the DVR failed to account for this problem. Revise the DVR to include a discussion of these issues.

4. Matrix issues were noted for the radium-226 (Ra-226) soil samples. For sample BWBG-SB20-20, repeated efforts at the laboratory resulted in failure of the sample preparation. The laboratory indicated that the sample would not precipitate. This method failure was not mentioned in the DVR. The laboratory reported this as a non-detect. However, no result should have been reported

at all. Unless a scientifically defensible rationale for the use of this datum is provided, this result must be qualified "R" and the completeness description in the report revised. Revise accordingly.

5. For eight additional soil samples for Ra-226, the carrier recovery was low, below limits, and for six of these samples yields were truncated. The laboratory concluded that there was "physical evidence of matrix interference." For 18 samples the MS/MSD RPD was out of limits. The DVR notes carrier and RPD conditions and states that because results "were cross referenced with their LCSs" no qualification was required, and also "Sample results were corrected for carrier recovery and/or re-extracted and compared to LCS recoveries. Therefore, no qualification was required." This treatment is not adequate and fails to meaningfully address the issues. Provide a more detailed examination of the Ra-226 results with specific description of their handling and specific assessment of the impacts of analytical anomalies to data usability. Provide a scientifically defensible rationale for the use of these Ra-226 results despite clear evidence of matrix interference.

6. Ra-228 soil samples were subject to similar issues as noted above for Ra-226 in soil. Six samples exhibited unacceptable carrier recovery and yields were truncated. The RPD for the MS/MSD pair was out of limits for 20 samples. The DVR makes no mention of these matters whatsoever. Re-assess the Ra-228 results for data usability.

7. Two matrix spikes exhibited low recovery affecting 13 associated samples. The DVR notes this in a very generic and cursory manner, "The MS and/or MSD percent recoveries (%Rs) for Lead-210 were outside QC limits associated with the soil samples as well as Carbon 14 MS %Rs." However, the LCS result is used to conclude that no qualification is necessary. Either the procedure for testing the significance of MS results from ERDU should be applied, or another approach proposed. The proper conclusion when an LCS is well controlled and an MS fails is that there is suspect matrix interference. Passage of the LCS cannot be a rationale for acceptance of failed spike results. Revise the report to include at a minimum a scientifically defensible rationale for data acceptance must be presented, or appropriately qualify the results.

Minor Comments

1. For assessing the derived background concentrations in groundwater, the site data were compared to United States Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCLs) as well as the New Mexico Administrative Code limits (NMAC 20.6.2.3103) for human health standards. The comparison to these data is acceptable for purposes of determining nature and extent of contamination. However, MCLs are not true risk based numbers and the human health standards in NMAC 20.6.2.3103 have not been updated in many years. In order to ensure that data are of sufficient quality for use in risk assessments, it may also be appropriate to compare the background data to the New Mexico tap water screening levels. Those metals that have tap water screening levels less than either criterion listed in the table include arsenic, cadmium, chromium, manganese, selenium, silver, vanadium, and mercury.

2. Section 3.1.2.3, Sampling Depths. The text indicates that samples were collected for surface soil (0-6 inches below ground surface, bgs), subsurface soil (7–30 feet bgs), and saturated subsurface soil (15–64 feet bgs). Typically for risk assessments addressing potential residential and construction worker scenarios, an exposure interval of 0–10 feet bgs is evaluated. There is concern that background data are not available for soil between six inches bgs and seven feet bgs, which

could result in skewed selection of constituents of potential concern (COPCs). Care should be taken when applying the background data against data from investigatory sites within the shallow subsurface soil zone. It is suggested that bore logs be reviewed to see if any significant changes in lithology or chemistry with depth differing significantly from that of the background data is noticed.

3. Section 5.6.1, Descriptive Summary Statistics. While use of a 95% confidence limit typically results in acceptable data, this is not always the case. ProUCL may result in the recommendation of a higher confidence limit, depending on the required robustness of the test. For future evaluations, note that while a 95% confidence limit may be applied in most of the cases, when a higher confidence limit is needed, this higher level of confidence should be applied.

4. Section 5.8.8, Comparison of Future Sampling Results to Background UTLs. The text indicates that individual sampling results will be compared to the background UTLs. However, no detail as to how this comparison will be conducted is provided. It is suggested that a defined site attribution analysis process, following a tiered approach, be developed, for consistency across sites. The following tiered approach is recommended:

   a. Comparison of maximum detected site concentrations to background reference value (*e.g.*, UTL);

   b. If the site maximum exceeds the background reference value, and sample size is sufficient, statistically compare the site data set to the background data set using appropriate statistical analyses (*e.g.*, Wilcoxon Rank Sum Test);. If the sampling size is not sufficient to perform statistical analysis, a comparison of the maximum site concentration to the maximum background concentrations shall be used;

   c. Conduct a graphical analysis of site data and background data (*e.g.*, histograms and/or box and whisker plots); and/or

   d. Conduct a geochemical analysis of site data to a background reference chemical.

5. Tables 3-1, 3-3, and 3-5. It is noted that the April 2009 NMED Soil Screening Levels (SSLs) were applied in the data tables. The SSLs were updated in December 2009. A review against the December 2009 SSLs was conducted. The only difference is the SSL for arsenic, which is now 3.9 milligrams per kilogram (mg/kg). The use of this updated value does not change conclusions in the table. This comment also applies to Table 3-3 for subsurface soil data. It is noted the following results in Table 3-3which were previously indicated as being above the SSL: SB03, SB09, SB19, and SB32. For saturated subsurface soil provided in Table 3-5, none of the data conclusion change. For all future reports, ensure that the most current screening levels and toxicological data are applied.

6. Tables 3-1, 3-3, and 3-5. It is noted that the SSL for hexavalent chromium was applied for comparison purposes. Based upon a review of the data, it appears that the analytical results may be reflective of total chromium. If the data are in fact for total chromium, a screening level for total chromium (assuming a ratio of hexavalent to trivalent chrome of 1:6) may be more appropriate.

7. Table 5-1. This table (as well as most of the data summary tables) contains several data points listed as negative values. Please clarify.

8. The User's Guide for ProUCL was provides in Appendix D. However, it does not appear that any of the input/output files from use of ProUCL were provided in the report. Note that for all future reports that include a ProUCL analysis, all input/output files used in generating the UTLs must be provided for review.

9. In reviewing the stiff diagrams provided in Appendix H, there appears to be two patterns of ionic strength, possibly leading to two groundwater characteristic units. The data for wells MW-19-03, MW-BG-04, S1-MW2, and TDS-MW02 appear to have stronger ionic strengths than the other wells. These wells appear to correlate with higher levels of total dissolved solids (TDS) as provided on Figure 4-6. There do not appear to be any consistent correlations between these wells and the isoconcentration lines for individual metals. Therefore, it appears that the differences in ionic strength may be representative of natural variability within the groundwater unit.

10. The DVR provides an overall assessment section which includes, "Overall, the data is (sic) suitable for the intended data usage." Typically this type of statement is reserved for a data quality assessment and not included in a DVR. If the DVR is going to reach to such conclusions then the intended use must be fully described including data quality objectives (DQOs) and measurement quality objectives (MQOs) and the data reconciled against those criteria. Revise accordingly.

11. On all future DVSRs, a column titled "Reason for Qualifier" should be added to all the tables currently titled "Summary of Qualified Data". This column should be used to define why the particular data validation qualifier is being assigned (i.e., due to method blank contamination, LCS recoveries outside acceptable limits, etc....) As the reports are currently written, there is no way to tell exactly why a validation qualifier was applied without looking back at the raw data package QC forms. Adding this "Reason for Qualifier" column will greatly enhance the clarity of the validation qualifiers for any reviewer/reader and will significantly reduce the time spent on any technical review of future DVSRs. Revise accordingly.

12. The samples, analyses, and resulting data were the subject of 25 separate non-conformance reports in the laboratory. These primarily document a number of matrix effects. Some of the non-conformance reports are redundant, some were resolved, and some were not resolved. It must be noted that the samples seemed to present significant difficulty for the laboratory and this complicates both the DVR and this oversight review as well as impacts data quality. A general finding of this oversight review is that the matrix effects and their impact to data usability were not properly identified in the DVR and conveyed to the data users. Discuss what steps, such as contacting the laboratory to obtain clarification of the many issues, were applied to obtain resolution of these issues.

13. Method Blanks were positive for a number of analytes and samples. A statistical evaluation of significance as per the ERDU to determine flagging status was applied. This procedure is appropriate and adequate. However, it was not possible to determine if the procedure was applied properly from the data supplied as nearly all positive results were already qualified for being below the reporting limit, and no data qualifier reason codes were provided. Clarify this issue.

14. Several matrix issues were noted for isotopic thorium (Th) aqueous samples. Non-conformance reports document that thorium was re-extracted using reduced sample volume due to severe matrix effects. It appears that this procedure was effective in eliminating the matrix effect. The issue is noted to some extent in the DVR under the reporting limit heading, as the ultimate effect on the data is an elevated MDA. However this should be addressed in both the matrix and reporting sections of the report, and not primarily the reporting limit section. The DVR states that, "The LCS tracer recovery for Thorium 229 was outside QC limits for all aqueous samples." An LCS was reported for Th-230 but Th-229 was not an analyte. It is assumed that Th-229 is a typographic error and that Th-230 was intended. It appears that the statement refers to the initial analysis of thorium, and not the reported final analysis. The closing statement of the reporting limits section of the DVR seems to support this, as does the laboratory report. However, this statement appears in the reporting limits section along with the summary of matrix effects and re-extractions, and its significance is not explained. Overall, this mixing of matrix assessment, reporting limit and LCS is very confusing, not particularly informative, and poorly written. Revise the DVR to address the following:

    a. A discussion of matrix effects with matrix spikes in a matrix section.
    b. Update the existing LCS section to include a discussion of the LCS.
    c. Note the overall combined impacts in the respective sections and include a detailed discussion in the overall summary section.
    d. Clarification of text to clearly identify and assess each issue by itself without mixing several unrelated items into a cursory compressed paragraph.
    e. This is a particularly large and complex report with numerous anomalies such as this one. In order to facilitate understanding and review, when multiple matrices exist within the same SDG, break the report apart to deal with each matrix separately.
    f. Provide a scientifically defensible rationale for acceptance or qualification of the data when anomalies exist.