

APPENDIX F

QUALITY ASSURANCE REPORTS FOR ANALYTICAL DATA

**Quality Assurance Report
For the Artillery and Mortar Impact Areas
South of Bains Gap Road
Parcel HR-138Q
IT Project No 796887
Fort McClellan Quality Assurance Report**

1.0 Overview

Eleven soil samples, 5 sediment samples, 4 surface water samples and 6 seep samples were collected in support of the investigation at Fort McClellan (FTMC) Parcel HR-138Q, Artillery and Mortar Impact Areas South of Bains Gap Road. All samples were submitted to EMAX Laboratories, Inc. for analysis. Soil, sediment, surface water, and seep samples were analyzed for target analyte list (TAL) metals, nitroaromatic-nitramine explosives, and perchlorate. QC samples consisted of the following types and quantities: 2 field duplicates, 2 MS/MSD, 5 trip blanks, and 3 equipment rinsates. An analytical summary table cross-referencing sample location, sample number, and contaminants of concern is presented in Attachment A.

One hundred (100) percent of samples were validated and reviewed in accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Evaluating Inorganic Data Review (EPA, February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines for Organic Review (EPA, October 1999)* for all areas except blanks. *Region III Laboratory Data Validation Functional Guidelines for Inorganic Analyses (EPA, April 1993)* and *Region III National Functional Guidelines for Organic Data Review (EPA, June 1992)* were applied to the areas associated with blank contamination. Data qualifiers assigned to results were based on guidance outlined in the referenced documents and the *Installation-Wide Sampling and Analysis Plan (IT, March 2000)* for FTMC. Table 1.0-1 and Table 1.0-2 define laboratory data and validation data qualifiers assigned to analytical results, respectively.

**Table 1.0-1
Laboratory Data Qualifier Definitions**

Data Qualifier	Laboratory Data Qualifier Definition
B	Analyte detected in method blank at concentration greater than the reporting limit (and greater than zero).
C	Confirming data obtained using second GC column or GC/MS.
E	Analyte concentration exceeded calibration range.
I	Analyte identification suspect. See narrative for explanation.
J	Result is less than or equal to specified reporting limit but greater than the method detection limit (MDL).
P	Analyte not confirmed. Results from primary and secondary GC columns differ by greater than 10 percent
S	Analyte concentration obtained using Method of Standard Additions (MSA).
U	Not detected. The value represented indicates the reporting limit for the analysis.
D	Sample analyzed as a dilution. The result reported has been calculated using the appropriate dilution factor.
No Code	Confirmed identification.

**Table 1.0-2
Validation Data Qualifier Definitions**

Validation Qualifier	Validation Data Qualifier Definition
U	Not detected. The associated number indicates approximate sample concentration necessary to be detected.
No Code	Confirmed identification
B	Not detected substantially above the level reported in laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
N	Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise. Considered an estimate.
NJ	Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

The Data Validation Summary Report is presented in Attachment B.

2.0 Summary

Data were evaluated to verify compliance with precision, accuracy, representativeness, comparability, completeness, and sensitivity. To verify that project data quality objectives (DQO) were met, laboratory analytical results and data packages were examined for compliance with SW846 SW6010B/SW7000 Series, SW8330 and U.S. Environmental Protection Agency (EPA) 314.0 quality control (QC) method criteria. Laboratory nonconformances and discrepancies in the data were also examined to determine their impact on the data. The results of this review are presented in the following sections.

2.1 Sample Receipt and Analytical Holding Times

All sample results generated by the laboratory during this investigation have been reviewed with respect to condition of samples as received by the laboratory, chain-of-custody, and analysis holding times. All coolers were received by EMAX in good condition under proper chain-of-custody.

All extraction and analytical holding times were met.

2.2 Rejected Data

No data were qualified by the laboratory or after validation was completed as being rejected ("R"-flagged).

2.3 Blank Results

A description of the types of blank samples which were collected, processed, and evaluated for background and/or process contamination during this sampling is as follows:

- Equipment rinsates (ER) are samples of analyte-free deionized water poured into, or over, or pumped through the sampling device, collected in a sample container, and transported to the laboratory for analysis. Equipment rinsates are used to assess the effectiveness of equipment decontamination procedures.
- Method blanks (MB) are used in the laboratory to assess and document any possible contamination resulting from the analytical process. A method blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank shall be carried through the complete sample preparation and analytical procedure.
- Initial and continuing calibration blanks (ICB and CCB) are an analyte-free matrix which is analyzed to verify the analysis system is free of contamination. ICBs and CCBs are analyzed immediately after the initial and continuing calibration is performed.

Field sample concentrations were evaluated to determine if the sample results could have been biased by the presence of any contamination measured in equipment rinsate blanks, method blanks and/or initial/continuing calibration blanks. Sample data affected by blank contamination are summarized in Table 2.3-1.

**Table 2.3-1
Summary of Blank Contamination**

Sample Delivery Group	Sample Number	Contaminant	Action
10138Q-01	YE0002, YE0003 & YE0009	Cobalt	Cobalt results for samples YE0002, YE0003 and YE0009 were "B" qualified.
	YE0003, YE0005 & YE0010	Antimony	Antimony results for samples YE0003, YE0005 and YE0010 were "B" qualified.
10138Q-02	YE1005	Beryllium Cobalt	Beryllium and cobalt results for sample YE1005 was "B" qualified.
	YE1006	Calcium Chromium Vanadium	Calcium, chromium and vanadium results for sample YE1006 were "B" qualified.
10138Q-04	YE1004	Zinc	Zinc result for sample YE1004 was "B" qualified.
10138Q-05	YE2002, YE2003 & YE2006	Calcium	Calcium results for samples YE2002, YE2003 and YE2006 were "B" qualified.
	YE2002 & YE2003	Lead	Lead results for samples YE2002 and YE2003 were "B" qualified.
	YE2007	Copper	Copper result for sample YE2007 was "B" qualified.

2.4 Analytical Precision

Precision is defined as a measurement of mutual agreement among individual measurements of the same property, usually under "prescribed similar conditions." Analytical precision is calculated as relative percent difference (%RPD) based on the following formula:

$$\%RPD = \left| \frac{(A-B)}{(A+B)/2} \right| \times 100$$

where:

- %RPD = Relative Percent Difference
- A = original result
- B = duplicate result

A high RPD between an original sample and its field duplicate may be attributable to the difference in sample matrix or distribution of the contaminant within the sample, rather than the precision of the collection process. Also, when "estimated" results are reported, there is a

potential for increased variability between the primary and duplicate sample results. This occurs because, at low concentrations, the relative difference in results is magnified by the RPD calculation even though the results are comparable in absolute terms. There is also increased uncertainty in the results as the lower limit of detection is approached, due to decreasing analytical accuracy. The RPD calculation cannot be performed in cases where non-detected results are reported with corresponding samples that contain detectable concentrations.

Overall sampling and analysis precision for this task was assessed using field duplicate (FD) samples. Laboratory precision was assessed by laboratory control sample/laboratory control sample duplicate (LCS/LCSD) and matrix spike/matrix spike duplicate (MS/MSD) recoveries. Results indicate that an acceptable analytical precision was achieved. Table 2.4-1 lists precision acceptance criteria for LCS/LCSD, MS/MSD organic and inorganic analyses and field duplicate comparisons. RPD anomalies are summarized in Table 2.4-2.

**Table 2.4-1
Precision Acceptance Criteria**

Field/Laboratory QC Type	Matrix	
	Aqueous	Soil
Field Duplicate (Both Organic & Inorganic)	RPD < 35%	RPD < 50%
Perchlorate LCS/LCSD and MS/MSD	RPD < 10%	RPD < 20%
Nitroaromatic and Nitramine Explosives LCS/LCSD and MS/MSD	Refer to Table 8-1of FTMC "Installation Wide Sample and Analysis Plan"	Refer to Table 8-1of FTMC "Installation Wide Sample and Analysis Plan"
Metals LCS/LCSD and MS/MSD	RPD < 20%	RPD < 20%

**Table 2.4-2
Summary of Field Duplicate, LCS/LCSD & MS/MSD RPD Anomalies**

Sample Delivery Group	Sample Number	Contaminant (RPD %)	Assigned Validation Qualifier
10138Q-01	YE0001 MS/MSD	Antimony (21%) Iron (27%)	Antimony and iron results for samples YE0001, YE0002, YE0003, YE0005, YE0006, YE0007, YE0008, YE0009 and YE0010 were "J" / "UJ" / "B" qualified due to failing MS/MSD.
	YE0009 MS/MSD	Iron (64%)	Iron results for samples YE0001, YE0002, YE0003, YE0005, YE0006, YE0007, YE0008, YE0009 and YE0010 were "J" qualified due to failing MS/MSD.
10138Q-04	IPE026SL / IPE026SC (LCS/LCSD)	Zinc (23%)	Zinc results for samples YE0011, YE0012, YE1003 & YE1004 were "J" qualified due to LCS/LCSD RPD exceedance.

2.5 Analytical Accuracy Assessment

Accuracy is a measure of the degree of agreement of a result against an accepted reference or true value. Accuracy is expressed as a percent recovery (%R) calculated by the ratio of the measurement and accepted true value as shown in the following equation:

$$\%R = (|X_s - X_u|/K) \times 100$$

where:

- X_s = measured value of the spiked sample
- X_u = measured value of the unspiked sample
- K = known amount of the spike in the sample

Surrogate recoveries, MS/MSD and LCS/LCSD, were used to measure analytical accuracy as described in SW846 SW6010B/SW7000 Series methodology, nitroaromatic-nitramine explosives by SW8330, and perchlorate by EPA 314.0. Reported results indicate that an acceptable level of analytical accuracy was achieved. LCS/LCSD and MS/MSD spike recoveries which exceed QA criteria are summarized in Table 2.5-1.

**Table 2.5-1
Summary of LCS/LCSD and MS/MSD Spike Recovery Criteria Exceedances**

Sample Delivery Group	Sample Number	Contaminant	Action
10138Q-04	YE0001 MS/MSD	Antimony (LB) Iron (HB) Manganese (LB)	Antimony, iron and manganese results for samples YE0001, YE0002, YE0003, YE0005, YE0006, YE0007, YE0008, YE0009 and YE0010 were "J" / "UJ" / "B" qualified due to MS/MSD spike recoveries exceeding QA criteria.
	YE0009 MS/MSD	Antimony (LB) Iron (HB)	Antimony and iron results for samples YE0001, YE0002, YE0003, YE0005, YE0006, YE0007, YE0008, YE0009 and YE0010 were "J" / "UJ" / "B" qualified due to MS/MSD spike recoveries exceeding QA criteria.
10138Q-04	IPE026SL / IPE026SC (LCS/LCSD)	Zinc (HB)	Zinc results for samples YE0011, YE0012, YE1003 & YE1004 were "J" qualified due to LCS spike recovery exceeding QA criteria.

LB - low bias.
HB - high bias.

2.6 Data Representativeness

Representativeness is a qualitative parameter that expresses the degree to which sample data actually represent the matrix conditions. Sample locations selected for this investigation outline contaminant releases into the environment, that may have occurred and will confirm whether contaminated soil exists at this site. Soil sample data are being used to assess potential impacts to terrestrial biota that might use the site for food and/or habitat purposes.

Standardized requirements and procedures for sample collection and handling were employed to maximize sample representativeness.

2.7 Data Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. By employing well-recognized techniques and accepted standardized methods for sampling and analysis, data comparability was achieved during this sampling event.

2.8 Data Completeness

Completeness is calculated for the aggregation of data for each analyte measured during the investigation of Parcel HR-138Q Artillery and Mortar Impact Areas South of Bains Gap Road. The formula for calculating completeness is listed below:

$$\% \text{ Completeness} = (X_V / X_T) \times 100$$

where:

X_V = number of valid (i.e., non-"R"-flagged) results

X_T = number of possible results

Parcel HR-138Q goal for completeness is 95% for both aqueous and soil samples. The % Completeness for this task is calculated to be 100%.

- $\% \text{ Completeness} = (843 / 843) \times 100 = 100\%$

2.9 Sensitivity

Sensitivity is defined as the ability of the laboratory's established method detection limits (MDL)/method reporting limits (MRL or RL) to meet project-specific DQOs or site-specific screening levels (SSSL) and or ecological screening values (ESV).

MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. MDLs are determined from an analysis of a sample in a given matrix containing the target analyte of interest. The MRL is a threshold value based upon the sensitivity capability of method and instrument. MRLs are normally set at a minimum of two times the MDL. MRLs are adjusted based on the sample matrix, moisture (solids only), and any necessary sample dilutions. The laboratory cannot reliably quantitate values reported above the MDL but below the MRL. Therefore, these analyte values must be flagged as estimated quantities ("J"-flagged).

To evaluate method sensitivity, a general comparison of the laboratory's MDLs/MRLs and the site investigation screening levels (background values, human health SSSL for residential reuse, and [ESV]) was performed and presented to the FTMC Base Realignment and Closure Team (BCT) (November 1999). The comparison summarized the relationship between the MDL/MRLs and SSSL/ESVs for each parameter typically reported for all of the major analytical methods used at FTMC. The few cases identified where the MDL and/or MRL values exceeded their corresponding human health SSSL and/or ESV were specifically highlighted and explained. It was understood that for these cases, the standard analytical method of analysis was not going to provide MDLs/MRLs which met human health SSSLs or ESVs without significant uncertainty and

the possibility of reporting false negatives. It was generally accepted that standard EPA SW846 analytical methods would provide sufficient sensitivity for data reported and used in the site screening process at FTMC.

3.0 Data Usability

Data quality indicators (DQI) provide an internal guide for control and review to verify that data are scientifically sound, defensible, and of known and acceptable quality. Factors such as precision, accuracy, representativeness, comparability, completeness, and sensitivity were evaluated to determine if the project's DQOs were met. A review of the data revealed that the majority of QA/QC indicators were within acceptable control limits. Any data anomalies encountered during data validation and overall site evaluations have been summarized in the previous sections of this document.

Based on the results of data validation and QA review, IT has concluded that representative samples were collected and analyzed and that the results are indicative of the media analyzed. The data are to be considered representative of site conditions and are usable for their intended purpose.

4.0 Attachments

Attachment A - Analytical Summary Table

Attachment B - Data Validation Summary Report

ATTACHMENT A
ANALYTICAL SUMMARY TABLE

Ft. McClellan
Parcel HR-138Q
Artillery and Mortar Impact Areas South of Bains Gap Road
Analytical Summary
Project No. 796887

HR-138Q Soil Sampling				
Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-138Q-GP01	HR-138Q-GP01-SS-YE0001-REG	YE0001	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-GP01-SS-YE0001-MS	YE0001-MS	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-GP01-SS-YE0001-MSD	YE0001-MSD	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-GP01-DS-YE0002-REG	YE0002	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-GP01-DS-YE0003-FD	YE0003	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-138Q-GP02	HR-138Q-GP02-SS-YE0005-REG	YE0005	01-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-GP02-DS-YE0006-REG	YE0006	01-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-138Q-GP03	HR-138Q-GP03-SS-YE0007-REG	YE0007	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-GP03-DS-YE0008-REG	YE0008	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-138Q-GP04	HR-138Q-GP04-SS-YE0009-REG	YE0009	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-GP04-SS-YE0009-MS	YE0009-MS	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-GP04-SS-YE0009-MSD	YE0009-MSD	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-GP04-DS-YE0010-REG	YE0010	31-Jan-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-138Q-DEP01	HR-138Q-DEP01-SS-YE0011-REG	YE0011	03-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-DEP01-SS-YE0012-FD	YE0012	03-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-138Q Sediment and Surface Water Sampling				
Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-138Q-SD/SW02	HR-138Q-SD/SW02-SD-YE1003-REG	YE1003	03-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-SD/SW02-SW-YE2002-REG	YE2002	03-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-138Q-SD/SW03	HR-138Q-SD/SW03-SD-YE1004-REG	YE1004	02-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-SD/SW03-SW-YE2003-REG	YE2003	02-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-138Q-SD/SW04	HR-138Q-SD/SW04-SD-YE1005-REG	YE1005	25-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-SD/SW04-SW-YE2004-REG	YE2004	25-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-138Q-SD/SW05	HR-138Q-SD/SW05-SD-YE1006-REG	YE1006	24-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-SD/SW05-SW-YE2005-REG	YE2005	24-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-138Q Seep Sampling				
Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-138Q-SEEP01	HR-138Q-SEEP01-SEP-YE2006-REG	YE2006	02-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-SEEP01-SEP-YE2006R-REG	YE2006R	10-Jan-02	Lead by SW6010B.
HR-138Q-SEEP02	HR-138Q-SEEP02-SEP-YE2007-REG	YE2007	02-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-SEEP02-SEP-YE2007R-REG	YE2007R	10-Jan-02	Lead by SW6010B.
HR-138Q-SEEP03	HR-138Q-SEEP03-SEP-YE2008-REG	YE2008	02-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-138Q-SEEP03-SEP-YE2008R-REG	YE2008R	10-Jan-02	Lead by SW6010B.

ATTACHMENT B
DATA VALIDATION SUMMARY REPORT

**Data Validation Summary Report
For the Site Investigation Performed at the
“Artillery and Motar Impact Areas South of Bains Gap”
Parcel HR-138Q
Fort McClellan, Calhoun County, Alabama**

1.0 Introduction

Level III data validation was performed on 100% of the environmental samples collected for HR-138Q. The analytical data consisted of six sample delivery groups (SDG), 10138Q-01, 10138Q-02, 10138Q-03, 10138Q-04, 10138Q-05, and 10138Q-06, which were analyzed by EMAX Laboratories. The chemical parameters for which the samples were analyzed, are identified below:

Parameter (Method)
Metals by SW846 6010B and 7471A/7470A
Nitroaromatic and Nitramine Explosives by SW846 8330
Perchlorate by EPA 314.0 and Total Organic Carbon (TOC) by SW846 9060

2.0 Procedures

The sample data were validated following the logic identified in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines For Inorganic Data Review (February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines For Organic Review (October 1999)* for all areas except Blanks. *Region III Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses (April 1993)* and *Region III National Functional Guidelines for Organic Data Review (June 1992)* were applied to the areas associated with blank contamination. Specific quality control (QC) criteria, as identified in the Quality Assurance Plan (QAP), analytical methods, and laboratory Standard Operating Procedures (SOP's) were applied to all sample results. As the result of the use of Update III SW846 test methods for the analytical data and the application of the CLP guidelines during the validation process, there were instances where specific QC requirements for all target compounds were not defined. This primarily occurred in the organic, Gas Chromatograph (GC) and Gas Chromatograph/Mass Spectra (GC/MS) calibration areas and is due to the fact that the analytical methods are performance-based, and allows the use of average calibration responses, in lieu of, individual responses, which are defined by CLP protocol. In light of applying CLP guidelines to SW846 methods and evaluating the usability of the data during the

validation process, specific QC criteria were determined to address all target compounds and are identified in this report for each parameter, as well as, in the validation checklists, which function as worksheets. All completed validation checklists are on file in the Knoxville office. For those analytical methods not addressed by the CLP and Region III guidelines, the validation was based on the method requirements (i. e. SW846, CFR, SOP's) and technical judgement, following the logic of the CLP validation guidelines.

3.0 Summary of Data Validation Findings

The overall quality of the data was determined to be acceptable with minimal qualifications. No data were rejected.

Individual validation reports have been prepared for each parameter and the overall results of the validation findings are summarized in this report. The validation qualifier data entry verification report (Attachment A) is also provided. This is a complete listing of all of the analytical results and the validation qualifiers assigned for HR-138Q. It also identifies the "use" column, which indicates which result to use in the event of a reanalysis. A listing of the validation qualifiers and the reason codes, along with their definitions are also found in Attachment A. The following section highlights the key findings of the data validation for each analysis.

4.0 Analysis-Specific Data Validation Summaries

4.1 Metals by SW846 6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were found to be acceptable, with the exception of the following:

SDG Number	Sample Number	Compound	Blank Contaminant	Validation Qualifier
10138Q-01	YE0002, YE0003, YE0009	Cobalt	ICB/CCB	B
	YE0003, YE0005, YE0010	Antimony	ICB/CCB	B
10138Q-02	YE1005	Beryllium, Cobalt	ICB/CCB	B
	YE1006	Calcium, Chromium, Vanadium	ICB/CCB	B
10138Q-04	YE1004	Zinc	Method, ICB/CCB	B
10138Q-05	YE2002, YE2003, YE2006	Calcium	ICB/CCB	B
	YE2002, YE2003	Lead	ICB/CCB	B
	YE2007	Copper	ICB/CCB	B

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met with the following exceptions:

SDG Number	Sample Number	Compound	Validation Qualifier
10138Q-01	YE0001 through YE0010	Antimony, Iron, Manganese	J/UJ/B

Laboratory Control Sample (LCS)

LCS was performed for the project samples and all QC criteria were met with the following exceptions:

SDG Number	Sample	Compound	Validation Qualifier
10138Q-04	YE0011, YE0012, YE1003, YE1004	Zinc	J/B

Interference Check Sample (ICS)

All ICS % recoveries were acceptable. All QC criteria were met.

ICP Serial Dilutions

All QC criteria were met for the serial dilutions associated with the project samples with the following exceptions:

SDG Number	Sample	Compound	Validation Qualifier
10138Q-01	All	Zinc	J

Field Duplicates

Original and field duplicate results were evaluated and all QC criteria were met.

Sample Quantitation

Results quantitated between the IDL and the RL (“B” flagged by the laboratory) were qualified as estimated (J), unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected ‘R’.

4.2 Nitroaromatic and Nitramine Explosives by SW846 8330

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as ‘J’ were qualified as estimated “J” unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected ‘R’.

4.3 Perchlorate by EPA 314.0 and TOC by SW846 9060

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J' were qualified as estimated "J", unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

**Data Validation Summary Report
For the Site Investigation Performed at the
“Artillery and Motar Impact Areas South of Bains Gap”
Parcel HR-138Q
Fort McClellan, Calhoun County, Alabama**

1.0 Introduction

Level III data validation was performed on 100% of the environmental samples collected for HR-138Q. The analytical data consisted of six sample delivery groups (SDG), 10138Q-01, 10138Q-02, 10138Q-03, 10138Q-04, 10138Q-05, and 10138Q-06, which were analyzed by EMAX Laboratories. The chemical parameters for which the samples were analyzed, are identified below:

Parameter (Method)
Metals by SW846 6010B and 7471A/7470A
Nitroaromatic and Nitramine Explosives by SW846 8330
Perchlorate by EPA 314.0 and Total Organic Carbon (TOC) by SW846 9060

2.0 Procedures

The sample data were validated following the logic identified in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines For Inorganic Data Review (February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines For Organic Review (October 1999)* for all areas except Blanks. *Region III Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses (April 1993)* and *Region III National Functional Guidelines for Organic Data Review (June 1992)* were applied to the areas associated with blank contamination. Specific quality control (QC) criteria, as identified in the Quality Assurance Plan (QAP), analytical methods, and laboratory Standard Operating Procedures (SOP's) were applied to all sample results. As the result of the use of Update III SW846 test methods for the analytical data and the application of the CLP guidelines during the validation process, there were instances where specific QC requirements for all target compounds were not defined. This primarily occurred in the organic, Gas Chromatograph (GC) and Gas Chromatograph/Mass Spectra (GC/MS) calibration areas and is due to the fact that the analytical methods are performance-based, and allows the use of average calibration responses, in lieu of, individual responses, which are defined by CLP protocol. In light of applying CLP guidelines to SW846 methods and evaluating the usability of the data during the

validation process, specific QC criteria were determined to address all target compounds and are identified in this report for each parameter, as well as, in the validation checklists, which function as worksheets. All completed validation checklists are on file in the Knoxville office. For those analytical methods not addressed by the CLP and Region III guidelines, the validation was based on the method requirements (i. e. SW846, CFR, SOP's) and technical judgement, following the logic of the CLP validation guidelines.

3.0 Summary of Data Validation Findings

The overall quality of the data was determined to be acceptable with minimal qualifications. No data were rejected.

Individual validation reports have been prepared for each parameter and the overall results of the validation findings are summarized in this report. The validation qualifier data entry verification report (Attachment A) is also provided. This is a complete listing of all of the analytical results and the validation qualifiers assigned for HR-138Q. It also identifies the "use" column, which indicates which result to use in the event of a reanalysis. A listing of the validation qualifiers and the reason codes, along with their definitions are also found in Attachment A. The following section highlights the key findings of the data validation for each analysis.

4.0 Analysis-Specific Data Validation Summaries

4.1 Metals by SW846 6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were found to be acceptable, with the exception of the following:

SDG Number	Sample Number	Compound	Blank Contaminant	Validation Qualifier
10138Q-01	YE0002, YE0003, YE0009	Cobalt	ICB/CCB	B
	YE0003, YE0005, YE0010	Antimony	ICB/CCB	B
10138Q-02	YE1005	Beryllium, Cobalt	ICB/CCB	B
	YE1006	Calcium, Chromium, Vanadium	ICB/CCB	B
10138Q-04	YE1004	Zinc	Method, ICB/CCB	B
10138Q-05	YE2002, YE2003, YE2006	Calcium	ICB/CCB	B
	YE2002, YE2003	Lead	ICB/CCB	B
	YE2007	Copper	ICB/CCB	B

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met with the following exceptions:

SDG Number	Sample Number	Compound	Validation Qualifier
10138Q-01	YE0001 through YE0010	Antimony, Iron, Manganese	J/UJ/B

Laboratory Control Sample (LCS)

LCS was performed for the project samples and all QC criteria were met with the following exceptions:

SDG Number	Sample	Compound	Validation Qualifier
10138Q-04	YE0011, YE0012, YE1003, YE1004	Zinc	J/B

Interference Check Sample (ICS)

All ICS % recoveries were acceptable. All QC criteria were met.

ICP Serial Dilutions

All QC criteria were met for the serial dilutions associated with the project samples with the following exceptions:

SDG Number	Sample	Compound	Validation Qualifier
10138Q-01	All	Zinc	J

Field Duplicates

Original and field duplicate results were evaluated and all QC criteria were met.

Sample Quantitation

Results quantitated between the IDL and the RL ("B" flagged by the laboratory) were qualified as estimated (J), unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.2 Nitroaromatic and Nitramine Explosives by SW846 8330

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J' were qualified as estimated "J" unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.3 Perchlorate by EPA 314.0 and TOC by SW846 9060

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J' were qualified as estimated "J", unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

Validation Qualifiers

- U Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.
- J The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.
- B The concentration reported was detected significantly above the levels reported in the associated equipment rinse samples and/or laboratory method and trip blanks. (5X/10X Rule was applied).
- R The reported sample results are rejected due to the following:
1. Severe deficiencies in the supporting quality control data.
 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data.
 3. The presence or absence of the constituent cannot be verified based on the data provided.
 4. To indicate not to use a particular result in the event of a reanalysis.
- UJ The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the “nondetect” may be inaccurate or imprecise. The nondetect result should be estimated.

Validation Reason Code Definitions

Reason Code	Description
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 1 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10138Q-01																					
YE0001	SW6010B	SW3050	N	0	1	ALUMINUM	18900	mg/kg		Y	Y	P								B022-01	21:49
						ANTIMONY	12.5	mg/kg	U	N	Y	U	UJ	08A	08B					B022-01	21:49
						ARSENIC	3.74	mg/kg		Y	Y	P								B022-01	15:57
						BARIUM	74.1	mg/kg		Y	Y	P								B022-01	21:49
						BERYLLIUM	.626	mg/kg	J	Y	Y	P	J	15						B022-01	21:49
						CADMIUM	.625	mg/kg	U	N	Y	U	U							B022-01	21:49
						CALCIUM	125	mg/kg		Y	Y	P								B022-01	21:49
						CHROMIUM	13.9	mg/kg		Y	Y	P								B022-01	21:49
						COBALT	1.84	mg/kg	J	Y	Y	P	J	15						B022-01	21:49
						COPPER	5.27	mg/kg		Y	Y	P								B022-01	21:49
						IRON	16500	mg/kg		Y	Y	P	J	08A	08B					B022-01	21:49
						LEAD	11.2	mg/kg		Y	Y	P								B022-01	15:57
						MAGNESIUM	436	mg/kg		Y	Y	P								B022-01	21:49
						MANGANESE	177	mg/kg		Y	Y	P	J	08A						B022-01	21:49
						NICKEL	5.31	mg/kg		Y	Y	P								B022-01	21:49
						POTASSIUM	242	mg/kg	J	Y	Y	P	J	15						B022-01	21:49
						SELENIUM	1.25	mg/kg	U	N	Y	U	U							B022-01	15:57
						SILVER	1.25	mg/kg	U	N	Y	U	U							B022-01	21:49
						SODIUM	125	mg/kg	U	N	Y	U	U							B022-01	21:49
						THALLIUM	2.5	mg/kg	U	N	Y	U	U							B022-01	15:57
						VANADIUM	23.1	mg/kg		Y	Y	P								B022-01	21:49
						ZINC	17	mg/kg		Y	Y	P	J	13						B022-01	21:49
	SW7471A	TOTAL	N	0	1	MERCURY	.037	mg/kg	J	Y	Y	P	J	15						B022-01	13:12
YE0002	SW6010B	SW3050	N	0	1	ALUMINUM	6050	mg/kg		Y	Y	P								B022-02	21:53
						ANTIMONY	12.1	mg/kg	U	N	Y	U	UJ	08A	08B					B022-02	21:53
						ARSENIC	7.12	mg/kg		Y	Y	P								B022-02	16:23
						BARIUM	14	mg/kg		Y	Y	P								B022-02	21:53
						BERYLLIUM	.422	mg/kg	J	Y	Y	P	J	15						B022-02	21:53
						CADMIUM	.603	mg/kg	U	N	Y	U	U							B022-02	21:53
						CALCIUM	15.1	mg/kg	J	Y	Y	P	J	15						B022-02	21:53
						CHROMIUM	10.1	mg/kg		Y	Y	P								B022-02	21:53
						COBALT	.807	mg/kg	J	Y	Y	F	B	06B	15					B022-02	21:53
						COPPER	4.85	mg/kg		Y	Y	P								B022-02	21:53
						IRON	15600	mg/kg		Y	Y	P	J	08A	08B					B022-02	21:53
						LEAD	5.28	mg/kg		Y	Y	P								B022-02	16:23
						MAGNESIUM	187	mg/kg		Y	Y	P								B022-02	21:53
						MANGANESE	3.26	mg/kg		Y	Y	P	J	08A						B022-02	21:53
						NICKEL	2.6	mg/kg		Y	Y	P								B022-02	21:53
						POTASSIUM	1750	mg/kg		Y	Y	P								B022-02	21:53
						SELENIUM	1.21	mg/kg	U	N	Y	U	U							B022-02	16:23

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 2 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10138Q-01																					
YE0002	SW6010B	SW3050	N	0	1	SILVER	1.21	mg/kg	U	N	Y	U	U							B022-02	21:53
						SODIUM	121	mg/kg	U	N	Y	U	U							B022-02	21:53
						THALLIUM	2.41	mg/kg	U	N	Y	U	U							B022-02	16:23
						VANADIUM	14	mg/kg		Y	Y	P								B022-02	21:53
						ZINC	11.1	mg/kg		Y	Y	P	J		13					B022-02	21:53
	SW7471A	TOTAL	N	0	1	MERCURY	.121	mg/kg	U	N	Y	U	U							B022-02	13:22
YE0003	SW6010B	SW3050	N	0	1	ALUMINUM	5530	mg/kg		Y	Y									B022-03	21:58
						ANTIMONY	4.67	mg/kg	J	Y	Y	F	B		06B	08A	08B	15		B022-03	21:58
						ARSENIC	5.83	mg/kg		Y	Y									B022-03	16:27
						BARIUM	16.7	mg/kg		Y	Y									B022-03	21:58
						BERYLLIUM	.41	mg/kg	J	Y	Y		J		15					B022-03	21:58
						CADMIUM	.603	mg/kg	U	N	Y		U							B022-03	21:58
						CALCIUM	16.1	mg/kg	J	Y	Y		J		15					B022-03	21:58
						CHROMIUM	8.39	mg/kg		Y	Y									B022-03	21:58
						COBALT	1.02	mg/kg	J	Y	Y	F	B		06B	15				B022-03	21:58
						COPPER	4.5	mg/kg		Y	Y									B022-03	21:58
						IRON	12400	mg/kg		Y	Y		J		08A	08B				B022-03	21:58
						LEAD	4.89	mg/kg		Y	Y									B022-03	16:27
						MAGNESIUM	171	mg/kg		Y	Y									B022-03	21:58
						MANGANESE	2.67	mg/kg		Y	Y		J		08A					B022-03	21:58
						NICKEL	2.24	mg/kg	J	Y	Y		J		15					B022-03	21:58
						POTASSIUM	1790	mg/kg		Y	Y									B022-03	21:58
						SELENIUM	1.21	mg/kg	U	N	Y		U							B022-03	16:27
						SILVER	1.21	mg/kg	U	N	Y		U							B022-03	21:58
						SODIUM	121	mg/kg	U	N	Y		U							B022-03	21:58
						THALLIUM	2.41	mg/kg	U	N	Y		U							B022-03	16:27
						VANADIUM	11.4	mg/kg		Y	Y									B022-03	21:58
						ZINC	8.6	mg/kg		Y	Y		J		13					B022-03	21:58
	SW7471A	TOTAL	N	0	1	MERCURY	.121	mg/kg	U	N	Y		U							B022-03	13:25
YE0005	SW6010B	SW3050	N	0	1	ALUMINUM	13300	mg/kg		Y	Y	P								B032-01	22:41
						ANTIMONY	8.4	mg/kg	J	Y	Y	F	B		06B	08A	08B	15		B032-01	22:41
						ARSENIC	3.1	mg/kg		Y	Y	P								B032-01	16:47
						BARIUM	80.9	mg/kg		Y	Y	P								B032-01	22:41
						BERYLLIUM	.43	mg/kg	J	Y	Y	P	J		15					B032-01	22:41
						CADMIUM	.595	mg/kg	U	N	Y	U	U							B032-01	22:41
						CALCIUM	142	mg/kg		Y	Y	P								B032-01	22:41
						CHROMIUM	15.7	mg/kg		Y	Y	P								B032-01	22:41
						COBALT	2.59	mg/kg		Y	Y	P								B032-01	22:41
						COPPER	7.53	mg/kg		Y	Y	P								B032-01	22:41
						IRON	16700	mg/kg		Y	Y	P	J		08A	08B				B032-01	22:41

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 3 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10138Q-01																					
YE0005	SW6010B	SW3050	N	0	1	LEAD	12.7	mg/kg		Y	Y	P								B032-01	16:47
						MAGNESIUM	501	mg/kg		Y	Y	P								B032-01	22:41
						MANGANESE	146	mg/kg		Y	Y	P	J		08A					B032-01	22:41
						NICKEL	4.16	mg/kg		Y	Y	P								B032-01	22:41
						POTASSIUM	455	mg/kg	J	Y	Y	P	J		15					B032-01	22:41
						SELENIUM	1.19	mg/kg	U	N	Y	U	U							B032-01	16:47
						SILVER	1.19	mg/kg	U	N	Y	U	U							B032-01	22:41
						SODIUM	119	mg/kg	U	N	Y	U	U							B032-01	22:41
						THALLIUM	2.38	mg/kg	U	N	Y	U	U							B032-01	16:47
						VANADIUM	17.6	mg/kg		Y	Y	P								B032-01	22:41
						ZINC	18.4	mg/kg		Y	Y	P	J		13					B032-01	22:41
	SW7471A	TOTAL	N	0	1	MERCURY	.040	mg/kg	J	Y	Y	P	J		15					B032-01	13:42
YE0006	SW6010B	SW3050	N	0	1	ALUMINUM	23400	mg/kg		Y	Y	P								B032-02	22:45
						ANTIMONY	12	mg/kg	U	N	Y	U	UJ		08A	08B				B032-02	22:45
						ARSENIC	3.73	mg/kg		Y	Y	P								B032-02	17:07
						BARIIUM	32.8	mg/kg		Y	Y	P								B032-02	22:45
						BERYLLIUM	.424	mg/kg	J	Y	Y	P	J		15					B032-02	22:45
						CADMIUM	.598	mg/kg	U	N	Y	U	U							B032-02	22:45
						CALCIUM	53.9	mg/kg	J	Y	Y	P	J		15					B032-02	22:45
						CHROMIUM	16.7	mg/kg		Y	Y	P								B032-02	22:45
						COBALT	2.2	mg/kg	J	Y	Y	P	J		15					B032-02	22:45
						COPPER	10.6	mg/kg		Y	Y	P								B032-02	22:45
						IRON	33000	mg/kg		Y	Y	P	J		08A	08B				B032-02	22:45
						LEAD	7.38	mg/kg		Y	Y	P								B032-02	17:07
						MAGNESIUM	551	mg/kg		Y	Y	P								B032-02	22:45
						MANGANESE	47.9	mg/kg		Y	Y	P	J		08A					B032-02	22:45
						NICKEL	4.68	mg/kg		Y	Y	P								B032-02	22:45
						POTASSIUM	461	mg/kg	J	Y	Y	P	J		15					B032-02	22:45
						SELENIUM	1.2	mg/kg	U	N	Y	U	U							B032-02	17:07
						SILVER	1.2	mg/kg	U	N	Y	U	U							B032-02	22:45
						SODIUM	120	mg/kg	U	N	Y	U	U							B032-02	22:45
						THALLIUM	.817	mg/kg	J	Y	Y	P	J		15					B032-02	17:07
						VANADIUM	26.6	mg/kg		Y	Y	P								B032-02	22:45
						ZINC	21.3	mg/kg		Y	Y	P	J		13					B032-02	22:45
	SW7471A	TOTAL	N	0	1	MERCURY	.042	mg/kg	J	Y	Y	P	J		15					B032-02	13:44
YE0007	SW6010B	SW3050	N	0	1	ALUMINUM	9780	mg/kg		Y	Y	P								B022-04	22:03
						ANTIMONY	12.2	mg/kg	U	N	Y	U	UJ		08A	08B				B022-04	22:03
						ARSENIC	3.44	mg/kg		Y	Y	P								B022-04	16:31
						BARIIUM	49.7	mg/kg		Y	Y	P								B022-04	22:03
						BERYLLIUM	.329	mg/kg	J	Y	Y	P	J		15					B022-04	22:03

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 4 of 22

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:							Qlfr	Code:	1	2	3	4		
10138Q-01																	
YE0007	SW6010B	SW3050	N 0 1	CADMIUM	.609	mg/kg	U	N	Y	U	U					B022-04	22:03
				CALCIUM	86.1	mg/kg	J	Y	Y	P	J	15				B022-04	22:03
				CHROMIUM	9.34	mg/kg		Y	Y	P						B022-04	22:03
				COBALT	2.32	mg/kg	J	Y	Y	P	J	15				B022-04	22:03
				COPPER	3.38	mg/kg		Y	Y	P						B022-04	22:03
				IRON	10700	mg/kg		Y	Y	P	J	08A	08B			B022-04	22:03
				LEAD	19.3	mg/kg		Y	Y	P						B022-04	16:31
				MAGNESIUM	301	mg/kg		Y	Y	P						B022-04	22:03
				MANGANESE	118	mg/kg		Y	Y	P	J	08A				B022-04	22:03
				NICKEL	2.5	mg/kg		Y	Y	P						B022-04	22:03
				POTASSIUM	253	mg/kg	J	Y	Y	P	J	15				B022-04	22:03
				SELENIUM	1.22	mg/kg	U	N	Y	U	U					B022-04	16:31
				SILVER	1.22	mg/kg	U	N	Y	U	U					B022-04	22:03
				SODIUM	122	mg/kg	U	N	Y	U	U					B022-04	22:03
				THALLIUM	2.44	mg/kg	U	N	Y	U	U					B022-04	16:31
				VANADIUM	15.8	mg/kg		Y	Y	P						B022-04	22:03
				ZINC	14.2	mg/kg		Y	Y	P	J	13				B022-04	22:03
	SW7471A	TOTAL	N 0 1	MERCURY	.038	mg/kg	J	Y	Y	P	J	15				B022-04	13:34
YE0008	SW6010B	SW3050	N 0 1	ALUMINUM	25100	mg/kg		Y	Y	P						B022-05	22:08
				ANTIMONY	12.4	mg/kg	U	N	Y	U	UJ	08A	08B			B022-05	22:08
				ARSENIC	7.38	mg/kg		Y	Y	P						B022-05	16:35
				BARIUM	27.7	mg/kg		Y	Y	P						B022-05	22:08
				BERYLLIUM	.296	mg/kg	J	Y	Y	P	J	15				B022-05	22:08
				CADMIUM	.62	mg/kg	U	N	Y	U	U					B022-05	22:08
				CALCIUM	17.5	mg/kg	J	Y	Y	P	J	15				B022-05	22:08
				CHROMIUM	32.3	mg/kg		Y	Y	P						B022-05	22:08
				COBALT	1.86	mg/kg	J	Y	Y	P	J	15				B022-05	22:08
				COPPER	10.2	mg/kg		Y	Y	P						B022-05	22:08
				IRON	29600	mg/kg		Y	Y	P	J	08A	08B			B022-05	22:08
				LEAD	8.1	mg/kg		Y	Y	P						B022-05	16:35
				MAGNESIUM	750	mg/kg		Y	Y	P						B022-05	22:08
				MANGANESE	14.8	mg/kg		Y	Y	P	J	08A				B022-05	22:08
				NICKEL	4.71	mg/kg		Y	Y	P						B022-05	22:08
				POTASSIUM	838	mg/kg		Y	Y	P						B022-05	22:08
				SELENIUM	1.24	mg/kg	U	N	Y	U	U					B022-05	16:35
				SILVER	1.24	mg/kg	U	N	Y	U	U					B022-05	22:08
				SODIUM	124	mg/kg	U	N	Y	U	U					B022-05	22:08
				THALLIUM	.717	mg/kg	J	Y	Y	P	J	15				B022-05	16:35
				VANADIUM	50.1	mg/kg		Y	Y	P						B022-05	22:08
				ZINC	16.6	mg/kg		Y	Y	P	J	13				B022-05	22:08

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 5 of 22

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10138Q-01																	
YE0008	SW7471A	TOTAL	N 0 1	MERCURY	.026	mg/kg	J	Y	Y	P	J	15				B022-05	13:37
YE0009	SW6010B	SW3050	N 0 1	ALUMINUM	9670	mg/kg		Y	Y	P						B022-06	22:12
				ANTIMONY	11.8	mg/kg	U	N	Y	U	UJ	08A	08B			B022-06	22:12
				ARSENIC	1.33	mg/kg		Y	Y	P						B022-06	16:39
				BARIUM	73.3	mg/kg		Y	Y	P						B022-06	22:12
				BERYLLIUM	.271	mg/kg	J	Y	Y	P	J	15				B022-06	22:12
				CADMIUM	.591	mg/kg	U	N	Y	U	U					B022-06	22:12
				CALCIUM	241	mg/kg		Y	Y	P						B022-06	22:12
				CHROMIUM	6.63	mg/kg		Y	Y	P						B022-06	22:12
				COBALT	1.54	mg/kg	J	Y	Y	F	B	06B	15			B022-06	22:12
				COPPER	3.21	mg/kg		Y	Y	P						B022-06	22:12
				IRON	5260	mg/kg		Y	Y	P	J	08A	08B			B022-06	22:12
				LEAD	10.6	mg/kg		Y	Y	P						B022-06	16:39
				MAGNESIUM	443	mg/kg		Y	Y	P						B022-06	22:12
				MANGANESE	77.1	mg/kg		Y	Y	P	J	08A				B022-06	22:12
				NICKEL	3.91	mg/kg		Y	Y	P						B022-06	22:12
				POTASSIUM	205	mg/kg	J	Y	Y	P	J	15				B022-06	22:12
				SELENIUM	1.18	mg/kg	U	N	Y	U	U					B022-06	16:39
				SILVER	1.18	mg/kg	U	N	Y	U	U					B022-06	22:12
				SODIUM	118	mg/kg	U	N	Y	U	U					B022-06	22:12
				THALLIUM	2.36	mg/kg	U	N	Y	U	U					B022-06	16:39
				VANADIUM	9.63	mg/kg		Y	Y	P						B022-06	22:12
				ZINC	13	mg/kg		Y	Y	P	J	13				B022-06	22:12
	SW7471A	TOTAL	N 0 1	MERCURY	.118	mg/kg	U	N	Y	U	U					B022-06	14:23
YE0010	SW6010B	SW3050	N 0 1	ALUMINUM	18700	mg/kg		Y	Y	P						B022-07	22:17
				ANTIMONY	7.61	mg/kg	J	Y	Y	F	B	06B	08A	08B	15	B022-07	22:17
				ARSENIC	7.34	mg/kg		Y	Y	P						B022-07	16:43
				BARIUM	38	mg/kg		Y	Y	P						B022-07	22:17
				BERYLLIUM	.364	mg/kg	J	Y	Y	P	J	15				B022-07	22:17
				CADMIUM	.614	mg/kg	U	N	Y	U	U					B022-07	22:17
				CALCIUM	30.8	mg/kg	J	Y	Y	P	J	15				B022-07	22:17
				CHROMIUM	16.5	mg/kg		Y	Y	P						B022-07	22:17
				COBALT	1.83	mg/kg	J	Y	Y	P	J	15				B022-07	22:17
				COPPER	6.04	mg/kg		Y	Y	P						B022-07	22:17
				IRON	38100	mg/kg		Y	Y	P	J	08A	08B			B022-07	22:17
				LEAD	7.93	mg/kg		Y	Y	P						B022-07	16:43
				MAGNESIUM	380	mg/kg		Y	Y	P						B022-07	22:17
				MANGANESE	25.8	mg/kg		Y	Y	P	J	08A				B022-07	22:17
				NICKEL	2.33	mg/kg	J	Y	Y	P	J	15				B022-07	22:17
				POTASSIUM	1640	mg/kg		Y	Y	P						B022-07	22:17

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 6 of 22

Sample Number:	Analytical/Extraction Method:		Fit	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10138Q-01																					
YE0010	SW6010B	SW3050	N	0	1	SELENIUM	1.23	mg/kg	U	N	Y	U	U							B022-07	16:43
						SILVER	1.23	mg/kg	U	N	Y	U	U							B022-07	22:17
						SODIUM	123	mg/kg	U	N	Y	U	U							B022-07	22:17
						THALLIUM	2.46	mg/kg	U	N	Y	U	U							B022-07	16:43
						VANADIUM	22.6	mg/kg		Y	Y	P								B022-07	22:17
						ZINC	11.1	mg/kg		Y	Y	P	J		13					B022-07	22:17
	SW7471A	TOTAL	N	0	1	MERCURY	.123	mg/kg	U	N	Y	U	U							B022-07	13:39
YE0001	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						2-AM-4,6-DNT	.16	mg/kg	J	Y	Y	P	J		15					B022-01	02:34
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						HMX	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						RDX	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
						TETRYL	.4	mg/kg	U	N	Y	U	U							B022-01	02:34
YE0002	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						HMX	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						RDX	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
						TETRYL	.4	mg/kg	U	N	Y	U	U							B022-02	04:35
YE0003	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y		U							B022-03	05:16
						1,3-DNB	.4	mg/kg	U	N	Y		U							B022-03	05:16
						2,4,6-TNT	.4	mg/kg	U	N	Y		U							B022-03	05:16
						2,4-DNT	.4	mg/kg	U	N	Y		U							B022-03	05:16
						2,6-DNT	.4	mg/kg	U	N	Y		U							B022-03	05:16

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 7 of 22

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10138Q-01																	
YE0003	SW8330	METHOD	N 0 1	2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U					B022-03	05:16	
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U					B022-03	05:16	
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U					B022-03	05:16	
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U					B022-03	05:16	
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U					B022-03	05:16	
				HMX	.4	mg/kg	U	N	Y	U					B022-03	05:16	
				NITROBENZENE	.4	mg/kg	U	N	Y	U					B022-03	05:16	
				RDX	.4	mg/kg	U	N	Y	U					B022-03	05:16	
				TETRYL	.4	mg/kg	U	N	Y	U					B022-03	05:16	
YE0005	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				1,3-DNB	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				2,4-DNT	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				2,6-DNT	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				HMX	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				RDX	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
				TETRYL	.4	mg/kg	U	N	Y	U	U				B032-01	00:33	
YE0006	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				1,3-DNB	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				2,4-DNT	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				2,6-DNT	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				HMX	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				RDX	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
				TETRYL	.4	mg/kg	U	N	Y	U	U				B032-02	01:13	
YE0007	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U				B022-04	05:56	
				1,3-DNB	.4	mg/kg	U	N	Y	U	U				B022-04	05:56	
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U				B022-04	05:56	

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 8 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:	
															1	2	3	4			
10138Q-01																					
YE0007	SW8330	METHOD	N	0	1	2,4-DNT	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						HMX	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						RDX	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
						TETRYL	.4	mg/kg	U	N	Y	U	U							B022-04	05:56
YE0008	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						HMX	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						RDX	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
						TETRYL	.4	mg/kg	U	N	Y	U	U							B022-05	06:37
YE0009	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						HMX	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						RDX	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
						TETRYL	.4	mg/kg	U	N	Y	U	U							B022-06	07:17
YE0010	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B022-07	13:43

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 9 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
															1	2	3	4		
10138Q-01																				
YE0010	SW8330	METHOD	N	0	1	1,3-DNB	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						2,4-DNT	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						2,6-DNT	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						HMX	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						RDX	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
						TETRYL	.4	mg/kg	U	N	Y	U	U						B022-07	13:43
YE0001	EPA314.0	NONE	N	0	1	PERCHLORATE	.0625	mg/kg	U	N	Y	U	U						B022-01	15:41
YE0002	EPA314.0	NONE	N	0	1	PERCHLORATE	.0603	mg/kg	U	N	Y	U	U						B022-02	16:33
YE0003	EPA314.0	NONE	N	0	1	PERCHLORATE	.0603	mg/kg	U	N	Y		U						B022-03	16:50
YE0005	EPA314.0	NONE	N	0	1	PERCHLORATE	.0595	mg/kg	U	N	Y	U	U						B032-01	18:33
YE0006	EPA314.0	NONE	N	0	1	PERCHLORATE	.0598	mg/kg	U	N	Y	U	U						B032-02	19:24
YE0007	EPA314.0	NONE	N	0	1	PERCHLORATE	.0609	mg/kg	U	N	Y	U	U						B022-04	17:07
YE0008	EPA314.0	NONE	N	0	1	PERCHLORATE	.062	mg/kg	U	N	Y	U	U						B022-05	17:24
YE0009	EPA314.0	NONE	N	0	1	PERCHLORATE	.0591	mg/kg	U	N	Y	U	U						B022-06	17:42
YE0010	EPA314.0	NONE	N	0	1	PERCHLORATE	.0614	mg/kg	U	N	Y	U	U						B022-07	21:01
10138Q-02																				
YE1005	SW6010B	SW3050	N	0	1	ALUMINUM	7570	mg/kg		Y	Y	P							D239-01	23:01
						ANTIMONY	12.9	mg/kg	U	N	Y	U	U						D239-01	23:01
						ARSENIC	3.88	mg/kg		Y	Y	P							D239-01	22:51
						BARIUM	74.8	mg/kg		Y	Y	P							D239-01	23:01
						BERYLLIUM	.796	mg/kg	J	Y	Y	F	B	06B	15				D239-01	23:01
						CADMIUM	.644	mg/kg	U	N	Y	U	U						D239-01	23:01
						CALCIUM	110	mg/kg	J	Y	Y	P	J	15					D239-01	23:01
						CHROMIUM	14.2	mg/kg		Y	Y	P							D239-01	23:01
						COBALT	3.56	mg/kg		Y	Y	F	B	06B					D239-01	23:01
						COPPER	4.97	mg/kg		Y	Y	P							D239-01	23:01
						IRON	29300	mg/kg		Y	Y	P							D239-01	23:01
						LEAD	7.26	mg/kg		Y	Y	P							D239-01	22:51
						MAGNESIUM	315	mg/kg		Y	Y	P							D239-01	23:01
						MANGANESE	139	mg/kg		Y	Y	P							D239-01	23:01
						NICKEL	3.97	mg/kg		Y	Y	P							D239-01	23:01

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 10 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10138Q-02																					
YE1005	SW6010B	SW3050	N	0	1	POTASSIUM	1850	mg/kg		Y	Y	P								D239-01	23:01
						SELENIUM	1.29	mg/kg	U	N	Y	U	U							D239-01	22:51
						SILVER	1.29	mg/kg	U	N	Y	U	U							D239-01	23:01
						SODIUM	129	mg/kg	U	N	Y	U	U							D239-01	23:01
						THALLIUM	.852	mg/kg	J	Y	Y	P	J		15					D239-01	22:51
						VANADIUM	17	mg/kg		Y	Y	P								D239-01	23:01
						ZINC	13.9	mg/kg		Y	Y	P								D239-01	23:01
	SW7471A	TOTAL	N	0	1	MERCURY	.129	mg/kg	U	N	Y	U	U							D239-01	15:13
YE1006	SW6010B	SW3050	N	0	1	ALUMINUM	2510	mg/kg		Y	Y	P								D239-02	23:06
						ANTIMONY	17.5	mg/kg	U	N	Y	U	U							D239-02	23:06
						ARSENIC	.77	mg/kg	J	Y	Y	P	J		15					D239-02	22:56
						BARIIUM	46.4	mg/kg		Y	Y	P								D239-02	23:06
						BERYLLIUM	1.75	mg/kg	U	N	Y	U	U							D239-02	23:06
						CADMIUM	.877	mg/kg	U	N	Y	U	U							D239-02	23:06
						CALCIUM	64.2	mg/kg	J	Y	Y	F	B		06B	15				D239-02	23:06
						CHROMIUM	1.1	mg/kg	J	Y	Y	F	B		06B	15				D239-02	23:06
						COBALT	3.51	mg/kg	U	N	Y	U	U							D239-02	23:06
						COPPER	11.7	mg/kg		Y	Y	P								D239-02	23:06
						IRON	1590	mg/kg		Y	Y	P								D239-02	23:06
						LEAD	89.3	mg/kg		Y	Y	P								D239-02	22:56
						MAGNESIUM	98.4	mg/kg	J	Y	Y	P	J		15					D239-02	23:06
						MANGANESE	5.57	mg/kg		Y	Y	P								D239-02	23:06
						NICKEL	3.51	mg/kg	U	N	Y	U	U							D239-02	23:06
						POTASSIUM	877	mg/kg	U	N	Y	U	U							D239-02	23:06
						SELENIUM	1.75	mg/kg	U	N	Y	U	U							D239-02	22:56
						SILVER	1.75	mg/kg	U	N	Y	U	U							D239-02	23:06
						SODIUM	175	mg/kg	U	N	Y	U	U							D239-02	23:06
						THALLIUM	3.51	mg/kg	U	N	Y	U	U							D239-02	22:56
						VANADIUM	1.74	mg/kg	J	Y	Y	F	B		06B					D239-02	23:06
						ZINC	4.78	mg/kg		Y	Y	P								D239-02	23:06
	SW7471A	TOTAL	N	0	1	MERCURY	.175	mg/kg	U	N	Y	U	U							D239-02	15:15
YE1005	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							D239-01	17:23
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							D239-01	17:23
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							D239-01	17:23
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							D239-01	17:23
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							D239-01	17:23
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							D239-01	17:23
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D239-01	17:23
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D239-01	17:23
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							D239-01	17:23

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 11 of 22

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10138Q-02																	
YE1005	SW8330	METHOD	N 0 1	4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D239-01	17:23
				HMX	.4	mg/kg	U	N	Y	U	U					D239-01	17:23
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					D239-01	17:23
				RDX	.4	mg/kg	U	N	Y	U	U					D239-01	17:23
				TETRYL	.4	mg/kg	U	N	Y	U	U					D239-01	17:23
YE1006	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				HMX	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				RDX	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
				TETRYL	.4	mg/kg	U	N	Y	U	U					D239-02	18:01
YE1005	E314.0	NONE	N 0 1	PERCHLORATE	.0644	mg/kg	U	N	Y	U	U					D239-01	20:46
YE1006	E314.0	NONE	N 0 1	PERCHLORATE	.0877	mg/kg	U	N	Y	U	U					D239-02	21:03
YE1005	SW9060	NONE	N 0 1	TOC	49.2	mg/kg		Y	Y	P					D239-01	10:30	
YE1006	SW9060	NONE	N 0 1	TOC	55.4	mg/kg		Y	Y	P					D239-02	10:50	
10138Q-03																	
YE2004	SW6010B	SW3010	N 0 1	ALUMINUM	.061	mg/L	J	Y	Y	P	J		15			D240-01	21:23
				ANTIMONY	.1	mg/L	U	N	Y	U	U					D240-01	21:23
				ARSENIC	.01	mg/L	U	N	Y	U	U					D240-01	20:13
				BARIUM	.0212	mg/L		Y	Y	P						D240-01	21:23
				BERYLLIUM	.001	mg/L	U	N	Y	U	U					D240-01	21:23
				CADMIUM	.01	mg/L	U	N	Y	U	U					D240-01	21:23
				CALCIUM	.278	mg/L	J	Y	Y	P	J		15			D240-01	21:23
				CHROMIUM	.01	mg/L	U	N	Y	U	U					D240-01	21:23
				COBALT	.02	mg/L	U	N	Y	U	U					D240-01	21:23
				COPPER	.02	mg/L	U	N	Y	U	U					D240-01	21:23
				IRON	.04	mg/L	J	Y	Y	P	J		15			D240-01	21:23
				LEAD	.01	mg/L	U	N	Y	U	U					D240-01	20:13
				MAGNESIUM	.295	mg/L	J	Y	Y	P	J		15			D240-01	21:23
				MANGANESE	.00651	mg/L	J	Y	Y	P	J		15			D240-01	21:23
				NICKEL	.02	mg/L	U	N	Y	U	U					D240-01	21:23

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 12 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10138Q-03																					
YE2004	SW6010B	SW3010	N	0	1	POTASSIUM	2.25	mg/L	J	Y	Y	P	J		15					D240-01	21:23
						SELENIUM	.01	mg/L	U	N	Y	U	U							D240-01	20:13
						SILVER	.01	mg/L	U	N	Y	U	U							D240-01	21:23
						SODIUM	.85	mg/L	J	Y	Y	P	J		15					D240-01	21:23
						THALLIUM	.01	mg/L	U	N	Y	U	U							D240-01	20:13
						VANADIUM	.01	mg/L	U	N	Y	U	U							D240-01	21:23
						ZINC	.02	mg/L	U	N	Y	U	U							D240-01	21:23
	SW7470A	TOTAL	N	0	1	MERCURY	.0005	mg/L	U	N	Y	U	U							D240-01	12:13
YE2005	SW6010B	SW3010	N	0	1	ALUMINUM	.244	mg/L		Y	Y	P								D240-02	21:27
						ANTIMONY	.1	mg/L	U	N	Y	U	U							D240-02	21:27
						ARSENIC	.01	mg/L	U	N	Y	U	U							D240-02	20:17
						BARIUM	.0258	mg/L		Y	Y	P								D240-02	21:27
						BERYLLIUM	.001	mg/L	U	N	Y	U	U							D240-02	21:27
						CADMIUM	.01	mg/L	U	N	Y	U	U							D240-02	21:27
						CALCIUM	.213	mg/L	J	Y	Y	P	J		15					D240-02	21:27
						CHROMIUM	.01	mg/L	U	N	Y	U	U							D240-02	21:27
						COBALT	.02	mg/L	U	N	Y	U	U							D240-02	21:27
						COPPER	.0108	mg/L	J	Y	Y	P	J		15					D240-02	21:27
						IRON	.631	mg/L		Y	Y	P								D240-02	21:27
						LEAD	.0208	mg/L		Y	Y	P								D240-02	20:17
						MAGNESIUM	.203	mg/L	J	Y	Y	P	J		15					D240-02	21:27
						MANGANESE	.0146	mg/L		Y	Y	P								D240-02	21:27
						NICKEL	.02	mg/L	U	N	Y	U	U							D240-02	21:27
						POTASSIUM	5	mg/L	U	N	Y	U	U							D240-02	21:27
						SELENIUM	.00175	mg/L	J	Y	Y	P	J		15					D240-02	20:17
						SILVER	.01	mg/L	U	N	Y	U	U							D240-02	21:27
						SODIUM	.837	mg/L	J	Y	Y	P	J		15					D240-02	21:27
						THALLIUM	.01	mg/L	U	N	Y	U	U							D240-02	20:17
						VANADIUM	.01	mg/L	U	N	Y	U	U							D240-02	21:27
						ZINC	.00853	mg/L	J	Y	Y	P	J		15					D240-02	21:27
	SW7470A	TOTAL	N	0	1	MERCURY	.0005	mg/L	U	N	Y	U	U							D240-02	12:15
YE2004	SW8330	METHOD	N	0	1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	U							D240-01	02:29
						1,3-DNB	.0004	mg/L	U	N	Y	U	U							D240-01	02:29
						2,4,6-TNT	.0004	mg/L	U	N	Y	U	U							D240-01	02:29
						2,4-DNT	.0004	mg/L	U	N	Y	U	U							D240-01	02:29
						2,6-DNT	.0004	mg/L	U	N	Y	U	U							D240-01	02:29
						2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U							D240-01	02:29
						2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U							D240-01	02:29
						3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U							D240-01	02:29
						4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U							D240-01	02:29

Validation Qualifier Data Entry Verification

Run Date: March 26, 2002

Fort McClellan

Page: 13 of 22

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10138Q-03																	
YE2004	SW8330	METHOD	N 0 1	4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					D240-01	02:29
				HMX	.001	mg/L	U	N	Y	U	U					D240-01	02:29
				NITROBENZENE	.0004	mg/L	U	N	Y	U	U					D240-01	02:29
				RDX	.0004	mg/L	U	N	Y	U	U					D240-01	02:29
				TETRYL	.0004	mg/L	U	N	Y	U	U					D240-01	02:29
YE2005	SW8330	METHOD	N 0 1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				1,3-DNB	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				2,4,6-TNT	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				2,4-DNT	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				2,6-DNT	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				HMX	.001	mg/L	U	N	Y	U	U					D240-02	03:08
				NITROBENZENE	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				RDX	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
				TETRYL	.0004	mg/L	U	N	Y	U	U					D240-02	03:08
YE2004	E314.0	NONE	N 0 1	PERCHLORATE	.005	mg/L	U	N	Y	U	U					D240-01	16:12
YE2005	E314.0	NONE	N 0 1	PERCHLORATE	.005	mg/L	U	N	Y	U	U					D240-02	17:03
10138Q-04																	
YE0011	SW6010B	SW3050	N 0 1	ALUMINUM	10800	mg/kg		Y	Y	P						E044-01	18:58
				ANTIMONY	12.9	mg/kg	U	N	Y	U	U					E044-01	18:58
				ARSENIC	4.18	mg/kg		Y	Y	P						E044-01	19:04
				BARIUM	130	mg/kg		Y	Y	P						E044-01	18:58
				BERYLLIUM	1.11	mg/kg	J	Y	Y	P	J	15				E044-01	18:58
				CADMIUM	.644	mg/kg	U	N	Y	U	U					E044-01	18:58
				CALCIUM	351	mg/kg		Y	Y	P						E044-01	18:58
				CHROMIUM	7.53	mg/kg		Y	Y	P						E044-01	18:58
				COBALT	20.1	mg/kg		Y	Y	P						E044-01	18:58
				COPPER	8.25	mg/kg		Y	Y	P						E044-01	18:58
				IRON	16300	mg/kg		Y	Y	P						E044-01	18:58
				LEAD	16.5	mg/kg		Y	Y	P						E044-01	19:04
				MAGNESIUM	498	mg/kg		Y	Y	P						E044-01	18:58
				MANGANESE	294	mg/kg		Y	Y	P						E044-01	18:58
				NICKEL	4.49	mg/kg		Y	Y	P						E044-01	18:58
				POTASSIUM	1910	mg/kg		Y	Y	P						E044-01	18:58
				SELENIUM	1.29	mg/kg	U	N	Y	U	U					E044-01	19:04

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 14 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
															1	2	3	4		
10138Q-04																				
YE0011	SW6010B	SW3050	N	0	1	SILVER	1.29	mg/kg	U	N	Y	U	U						E044-01	18:58
						SODIUM	129	mg/kg	U	N	Y	U	U						E044-01	18:58
						THALLIUM	2.57	mg/kg	U	N	Y	U	U						E044-01	19:04
						VANADIUM	12.7	mg/kg		Y	Y	P							E044-01	18:58
						ZINC	21.1	mg/kg		Y	Y	P	J		11A	11B			E044-01	18:58
	SW7471A	TOTAL	N	0	1	MERCURY	.027	mg/kg	J	Y	Y	P	J		15				E044-01	10:54
YE0012	SW6010B	SW3050	N	0	1	ALUMINUM	8310	mg/kg		Y	Y								E044-02	19:03
						ANTIMONY	12.5	mg/kg	U	N	Y		U						E044-02	19:03
						ARSENIC	4.99	mg/kg		Y	Y								E044-02	19:09
						BARIUM	105	mg/kg		Y	Y								E044-02	19:03
						BERYLLIUM	.955	mg/kg	J	Y	Y		J		15				E044-02	19:03
						CADMIUM	.626	mg/kg	U	N	Y		U						E044-02	19:03
						CALCIUM	363	mg/kg		Y	Y								E044-02	19:03
						CHROMIUM	6.27	mg/kg		Y	Y								E044-02	19:03
						COBALT	14.4	mg/kg		Y	Y								E044-02	19:03
						COPPER	10.7	mg/kg		Y	Y								E044-02	19:03
						IRON	18900	mg/kg		Y	Y								E044-02	19:03
						LEAD	12.7	mg/kg		Y	Y								E044-02	19:09
						MAGNESIUM	395	mg/kg		Y	Y								E044-02	19:03
						MANGANESE	284	mg/kg		Y	Y								E044-02	19:03
						NICKEL	5.49	mg/kg		Y	Y								E044-02	19:03
						POTASSIUM	2220	mg/kg		Y	Y								E044-02	19:03
						SELENIUM	1.25	mg/kg	U	N	Y		U						E044-02	19:09
						SILVER	1.25	mg/kg	U	N	Y		U						E044-02	19:03
						SODIUM	125	mg/kg	U	N	Y		U						E044-02	19:03
						THALLIUM	2.5	mg/kg	U	N	Y		U						E044-02	19:09
						VANADIUM	10.8	mg/kg		Y	Y								E044-02	19:03
						ZINC	19.7	mg/kg		Y	Y		J		11A	11B			E044-02	19:03
	SW7471A	TOTAL	N	0	1	MERCURY	.044	mg/kg	J	Y	Y		J		15				E044-02	10:57
YE1003	SW6010B	SW3050	N	0	1	ALUMINUM	7060	mg/kg		Y	Y	P							E044-03	19:08
						ANTIMONY	15.9	mg/kg	U	N	Y	U	U						E044-03	19:08
						ARSENIC	6.74	mg/kg		Y	Y	P							E044-03	19:14
						BARIUM	126	mg/kg		Y	Y	P							E044-03	19:08
						BERYLLIUM	1.06	mg/kg	J	Y	Y	P	J		15				E044-03	19:08
						CADMIUM	.795	mg/kg	U	N	Y	U	U						E044-03	19:08
						CALCIUM	359	mg/kg		Y	Y	P							E044-03	19:08
						CHROMIUM	23.7	mg/kg		Y	Y	P							E044-03	19:08
						COBALT	7.04	mg/kg		Y	Y	P							E044-03	19:08
						COPPER	5.38	mg/kg		Y	Y	P							E044-03	19:08
						IRON	35400	mg/kg		Y	Y	P							E044-03	19:08

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 15 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10138Q-04																					
YE1003	SW6010B	SW3050	N	0	1	LEAD	11.4	mg/kg		Y	Y	P								E044-03	19:14
						MAGNESIUM	336	mg/kg		Y	Y	P								E044-03	19:08
						MANGANESE	233	mg/kg		Y	Y	P								E044-03	19:08
						NICKEL	5.13	mg/kg		Y	Y	P								E044-03	19:08
						POTASSIUM	1620	mg/kg		Y	Y	P								E044-03	19:08
						SELENIUM	1.59	mg/kg	U	N	Y	U	U							E044-03	19:14
						SILVER	1.59	mg/kg	U	N	Y	U	U							E044-03	19:08
						SODIUM	159	mg/kg	U	N	Y	U	U							E044-03	19:08
						THALLIUM	3.18	mg/kg	U	N	Y	U	U							E044-03	19:14
						VANADIUM	20.2	mg/kg		Y	Y	P								E044-03	19:08
						ZINC	17.5	mg/kg		Y	Y	P	J		11A	11B				E044-03	19:08
	SW7471A	TOTAL	N	0	1	MERCURY	.159	mg/kg	U	N	Y	U	U							E044-03	10:59
YE1004	SW6010B	SW3050	N	0	1	ALUMINUM	168	mg/kg		Y	Y	P								E044-04	19:13
						ANTIMONY	11.8	mg/kg	U	N	Y	U	U							E044-04	19:13
						ARSENIC	1.18	mg/kg	U	N	Y	U	U							E044-04	19:19
						BARIUM	6.19	mg/kg		Y	Y	P								E044-04	19:13
						BERYLLIUM	1.18	mg/kg	U	N	Y	U	U							E044-04	19:13
						CADMIUM	.588	mg/kg	U	N	Y	U	U							E044-04	19:13
						CALCIUM	29.2	mg/kg	J	Y	Y	P	J		15					E044-04	19:13
						CHROMIUM	1.18	mg/kg	U	N	Y	U	U							E044-04	19:13
						COBALT	.653	mg/kg	J	Y	Y	P	J		15					E044-04	19:13
						COPPER	2.35	mg/kg	U	N	Y	U	U							E044-04	19:13
						IRON	89.5	mg/kg		Y	Y	P								E044-04	19:13
						LEAD	5.62	mg/kg		Y	Y	P								E044-04	19:19
						MAGNESIUM	13.8	mg/kg	J	Y	Y	P	J		15					E044-04	19:13
						MANGANESE	13.5	mg/kg		Y	Y	P								E044-04	19:13
						NICKEL	2.35	mg/kg	U	N	Y	U	U							E044-04	19:13
						POTASSIUM	588	mg/kg	U	N	Y	U	U							E044-04	19:13
						SELENIUM	1.18	mg/kg	U	N	Y	U	U							E044-04	19:19
						SILVER	1.18	mg/kg	U	N	Y	U	U							E044-04	19:13
						SODIUM	118	mg/kg	U	N	Y	U	U							E044-04	19:13
						THALLIUM	2.35	mg/kg	U	N	Y	U	U							E044-04	19:19
						VANADIUM	1.18	mg/kg	U	N	Y	U	U							E044-04	19:13
						ZINC	1.01	mg/kg	J	Y	Y	F	B		06A	06B	11A	11B		E044-04	19:13
	SW7471A	TOTAL	N	0	1	MERCURY	.118	mg/kg	U	N	Y	U	U							E044-04	11:02
YE0011	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							E044-01	19:11

Validation Qualifier Data Entry Verification

Run Date: March 26, 2002

Fort McClellan

Page: 16 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:	
															1	2	3	4			
10138Q-04																					
YE0011	SW8330	METHOD	N	0	1	2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						HMX	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						RDX	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
						TETRYL	.4	mg/kg	U	N	Y	U	U							E044-01	19:11
YE0012	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y		U							E044-02	19:49
						1,3-DNB	.4	mg/kg	U	N	Y		U							E044-02	19:49
						2,4,6-TNT	.4	mg/kg	U	N	Y		U							E044-02	19:49
						2,4-DNT	.4	mg/kg	U	N	Y		U							E044-02	19:49
						2,6-DNT	.4	mg/kg	U	N	Y		U							E044-02	19:49
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y		U							E044-02	19:49
						2-NITROTOLUENE	.4	mg/kg	U	N	Y		U							E044-02	19:49
						3-NITROTOLUENE	.4	mg/kg	U	N	Y		U							E044-02	19:49
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y		U							E044-02	19:49
						4-NITROTOLUENE	.4	mg/kg	U	N	Y		U							E044-02	19:49
						HMX	.4	mg/kg	U	N	Y		U							E044-02	19:49
						NITROBENZENE	.4	mg/kg	U	N	Y		U							E044-02	19:49
						RDX	.4	mg/kg	U	N	Y		U							E044-02	19:49
						TETRYL	.4	mg/kg	U	N	Y		U							E044-02	19:49
YE1003	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						HMX	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						RDX	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
						TETRYL	.4	mg/kg	U	N	Y	U	U							E044-03	20:28
YE1004	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							E044-04	21:44
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							E044-04	21:44
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							E044-04	21:44

Validation Qualifier Data Entry Verification

Run Date: March 26, 2002

Fort McClellan

Page: 17 of 22

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:										1	2	3	4		
10138Q-04																		
YE1004	SW8330	METHOD	N 0 1	2,4-DNT	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				HMX	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				RDX	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
				TETRYL	.4	mg/kg	U	N	Y	U	U					E044-04	21:44	
YE0011	E314.0	NONE	N 0 1	PERCHLORATE	.0644	mg/kg	U	N	Y	U	U					E044-01	23:03	
YE0012	E314.0	NONE	N 0 1	PERCHLORATE	.0626	mg/kg	U	N	Y		U					E044-02	23:54	
YE1003	E314.0	NONE	N 0 1	PERCHLORATE	.0795	mg/kg	U	N	Y	U	U					E044-03	00:11	
YE1004	E314.0	NONE	N 0 1	PERCHLORATE	.0588	mg/kg	U	N	Y	U	U					E044-04	00:28	
YE1003	SW9060	NONE	N 0 1	TOC	23.7	mg/kg		Y	Y	P						E044-03	11:30	
YE1004	SW9060	NONE	N 0 1	TOC	7.41	mg/kg		Y	Y	P						E044-04	11:50	
10138Q-05																		
YE2002	SW6010B	SW3010	N 0 1	ALUMINUM	.173	mg/L	J	Y	Y	P	J	15				E045-01	22:16	
				ANTIMONY	.1	mg/L	U	N	Y	U	U					E045-01	22:16	
				ARSENIC	.01	mg/L	U	N	Y	U	U					E045-01	22:48	
				BARIUM	.0228	mg/L		Y	Y	P						E045-01	22:16	
				BERYLLIUM	.001	mg/L	U	N	Y	U	U					E045-01	22:16	
				CADMIUM	.01	mg/L	U	N	Y	U	U					E045-01	22:16	
				CALCIUM	.166	mg/L	J	Y	Y	F	B	06B 15				E045-01	22:16	
				CHROMIUM	.01	mg/L	U	N	Y	U	U					E045-01	22:16	
				COBALT	.02	mg/L	U	N	Y	U	U					E045-01	22:16	
				COPPER	.02	mg/L	U	N	Y	U	U					E045-01	22:16	
				IRON	.217	mg/L		Y	Y	P						E045-01	22:16	
				LEAD	.00253	mg/L	J	Y	Y	F	B	06B 15				E045-01	22:48	
				MAGNESIUM	.244	mg/L	J	Y	Y	P	J	15				E045-01	22:16	
				MANGANESE	.0132	mg/L		Y	Y	P						E045-01	22:16	
				NICKEL	.02	mg/L	U	N	Y	U	U					E045-01	22:16	
				POTASSIUM	5	mg/L	U	N	Y	U	U					E045-01	22:16	
				SELENIUM	.01	mg/L	U	N	Y	U	U					E045-01	22:48	
				SILVER	.01	mg/L	U	N	Y	U	U					E045-01	22:16	
				SODIUM	.934	mg/L	J	Y	Y	P	J	15				E045-01	22:16	
				THALLIUM	.01	mg/L	U	N	Y	U	U					E045-01	22:48	
				VANADIUM	.01	mg/L	U	N	Y	U	U					E045-01	22:16	

Validation Qualifier Data Entry Verification

Run Date: March 26, 2002

Fort McClellan

Page: 18 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10138Q-05																					
YE2002	SW6010B	SW3010	N	0	1	ZINC	.02	mg/L	U	N	Y	U	U							E045-01	22:16
	SW7470A	TOTAL	N	0	1	MERCURY	.0005	mg/L	U	N	Y	U	U							E045-01	10:34
YE2003	SW6010B	SW3010	N	0	1	ALUMINUM	.0843	mg/L	J	Y	Y	P	J	15						E045-02	22:49
						ANTIMONY	.1	mg/L	U	N	Y	U	U							E045-02	22:49
						ARSENIC	.01	mg/L	U	N	Y	U	U							E045-02	22:03
						BARIUM	.0167	mg/L		Y	Y	P								E045-02	22:49
						BERYLLIUM	.001	mg/L	U	N	Y	U	U							E045-02	22:49
						CADMIUM	.01	mg/L	U	N	Y	U	U							E045-02	22:49
						CALCIUM	.145	mg/L	J	Y	Y	F	B	06B	15					E045-02	22:49
						CHROMIUM	.01	mg/L	U	N	Y	U	U							E045-02	22:49
						COBALT	.02	mg/L	U	N	Y	U	U							E045-02	22:49
						COPPER	.02	mg/L	U	N	Y	U	U							E045-02	22:49
						IRON	.0636	mg/L	J	Y	Y	P	J	15						E045-02	22:49
						LEAD	.00367	mg/L	J	Y	Y	F	B	06B	15					E045-02	22:03
						MAGNESIUM	.266	mg/L	J	Y	Y	P	J	15						E045-02	22:49
						MANGANESE	.00733	mg/L	J	Y	Y	P	J	15						E045-02	22:49
						NICKEL	.02	mg/L	U	N	Y	U	U							E045-02	22:49
						POTASSIUM	2.94	mg/L	J	Y	Y	P	J	15						E045-02	22:49
						SELENIUM	.01	mg/L	U	N	Y	U	U							E045-02	22:03
						SILVER	.01	mg/L	U	N	Y	U	U							E045-02	22:49
						SODIUM	1.08	mg/L		Y	Y	P								E045-02	22:49
						THALLIUM	.01	mg/L	U	N	Y	U	U							E045-02	22:03
						VANADIUM	.01	mg/L	U	N	Y	U	U							E045-02	22:49
						ZINC	.02	mg/L	U	N	Y	U	U							E045-02	22:49
	SW7470A	TOTAL	N	0	1	MERCURY	.0005	mg/L	U	N	Y	U	U							E045-02	10:37
YE2006	SW6010B	SW3010	N	0	1	ALUMINUM	.623	mg/L		Y	Y	P								E045-03	22:53
						ANTIMONY	.1	mg/L	U	N	Y	U	U							E045-03	22:53
						ARSENIC	.01	mg/L	U	N	Y	U	U							E045-03	22:07
						BARIUM	.0516	mg/L		Y	Y	P								E045-03	22:53
						BERYLLIUM	.001	mg/L	U	N	Y	U	U							E045-03	22:53
						CADMIUM	.01	mg/L	U	N	Y	U	U							E045-03	22:53
						CALCIUM	.144	mg/L	J	Y	Y	F	B	06B	15					E045-03	22:53
						CHROMIUM	.01	mg/L	U	N	Y	U	U							E045-03	22:53
						COBALT	.02	mg/L	U	N	Y	U	U							E045-03	22:53
						COPPER	.02	mg/L	U	N	Y	U	U							E045-03	22:53
						IRON	.709	mg/L		Y	Y	P								E045-03	22:53
						LEAD	.0194	mg/L		Y	Y	P								E045-03	22:07
						MAGNESIUM	.235	mg/L	J	Y	Y	P	J	15						E045-03	22:53
						MANGANESE	.0152	mg/L		Y	Y	P								E045-03	22:53
						NICKEL	.02	mg/L	U	N	Y	U	U							E045-03	22:53

Validation Qualifier Data Entry Verification

Run Date: March 26, 2002

Fort McClellan

Page: 19 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:						
													Qlfr	Code:	1	2	3	4								
10138Q-05																										
YE2006	SW6010B	SW3010	N	0	1	POTASSIUM	2.6	mg/L	J	Y	Y	P	J		15					E045-03	22:53					
						SELENIUM	.01	mg/L	U	N	Y	U	U										E045-03	22:07		
						SILVER	.01	mg/L	U	N	Y	U	U											E045-03	22:53	
						SODIUM	.921	mg/L	J	Y	Y	P	J					15						E045-03	22:53	
						THALLIUM	.01	mg/L	U	N	Y	U	U												E045-03	22:07
						VANADIUM	.01	mg/L	U	N	Y	U	U												E045-03	22:53
						ZINC	.02	mg/L	U	N	Y	U	U												E045-03	22:53
						SW7470A	TOTAL	N	0	1	MERCURY	.0005	mg/L	U	N	Y	U	U							E045-03	10:45
						YE2007	SW6010B	SW3010	N	0	1	ALUMINUM	.221	mg/L		Y	Y	P								E045-04
ANTIMONY	.1	mg/L	U	N	Y							U	U										E045-04	22:58		
ARSENIC	.01	mg/L	U	N	Y							U	U											E045-04	22:12	
BARIUM	.0238	mg/L		Y	Y							P												E045-04	22:58	
BERYLLIUM	.001	mg/L	U	N	Y							U	U											E045-04	22:58	
CADMIUM	.01	mg/L	U	N	Y							U	U											E045-04	22:58	
CALCIUM	1	mg/L	U	N	Y							U	U											E045-04	22:58	
CHROMIUM	.01	mg/L	U	N	Y							U	U											E045-04	22:58	
COBALT	.02	mg/L	U	N	Y							U	U											E045-04	22:58	
COPPER	.0051	mg/L	J	Y	Y							F	B					06B	15					E045-04	22:58	
IRON	.293	mg/L		Y	Y							P												E045-04	22:58	
LEAD	.00929	mg/L	J	Y	Y							P	J					15						E045-04	22:12	
MAGNESIUM	.155	mg/L	J	Y	Y							P	J					15						E045-04	22:58	
MANGANESE	.0103	mg/L		Y	Y							P												E045-04	22:58	
NICKEL	.02	mg/L	U	N	Y							U	U											E045-04	22:58	
POTASSIUM	2.27	mg/L	J	Y	Y							P	J					15						E045-04	22:58	
SELENIUM	.01	mg/L	U	N	Y							U	U											E045-04	22:12	
SILVER	.01	mg/L	U	N	Y							U	U											E045-04	22:58	
SODIUM	.868	mg/L	J	Y	Y							P	J					15						E045-04	22:58	
THALLIUM	.01	mg/L	U	N	Y							U	U											E045-04	22:12	
VANADIUM	.01	mg/L	U	N	Y							U	U											E045-04	22:58	
ZINC	.02	mg/L	U	N	Y	U	U											E045-04	22:58							
SW7470A	TOTAL	N	0	1	MERCURY	.0005	mg/L	U	N	Y	U	U							E045-04	10:47						
YE2008	SW6010B	SW3010	N	0	1	ALUMINUM	2.19	mg/L		Y	Y	P								E045-05	23:02					
						ANTIMONY	.1	mg/L	U	N	Y	U	U										E045-05	23:02		
						ARSENIC	.01	mg/L	U	N	Y	U	U										E045-05	22:16		
						BARIUM	.14	mg/L		Y	Y	P											E045-05	23:02		
						BERYLLIUM	.00065	mg/L	J	Y	Y	P	J					15					E045-05	23:02		
						CADMIUM	.01	mg/L	U	N	Y	U	U										E045-05	23:02		
						CALCIUM	.592	mg/L	J	Y	Y	P	J					15					E045-05	23:02		
						CHROMIUM	.01	mg/L	U	N	Y	U	U										E045-05	23:02		
						COBALT	.02	mg/L	U	N	Y	U	U										E045-05	23:02		

Validation Qualifier Data Entry Verification

Run Date: March 26, 2002

Fort McClellan

Page: 20 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
															1	2	3	4		
10138Q-05																				
YE2008	SW6010B	SW3010	N	0	1	COPPER	.0131	mg/L	J	Y	Y	P	J	15					E045-05	23:02
						IRON	3.78	mg/L		Y	Y	P							E045-05	23:02
						LEAD	.0453	mg/L		Y	Y	P							E045-05	22:16
						MAGNESIUM	.364	mg/L	J	Y	Y	P	J	15					E045-05	23:02
						MANGANESE	.0242	mg/L		Y	Y	P							E045-05	23:02
						NICKEL	.02	mg/L	U	N	Y	U	U						E045-05	23:02
						POTASSIUM	3.25	mg/L	J	Y	Y	P	J	15					E045-05	23:02
						SELENIUM	.01	mg/L	U	N	Y	U	U						E045-05	22:16
						SILVER	.01	mg/L	U	N	Y	U	U						E045-05	23:02
						SODIUM	1.08	mg/L		Y	Y	P							E045-05	23:02
						THALLIUM	.01	mg/L	U	N	Y	U	U						E045-05	22:16
						VANADIUM	.00405	mg/L	J	Y	Y	P	J	15					E045-05	23:02
						ZINC	.011	mg/L	J	Y	Y	P	J	15					E045-05	23:02
	SW7470A	TOTAL	N	0	1	MERCURY	.0005	mg/L	U	N	Y	U	U						E045-05	10:49
YE2002	SW8330	METHOD	N	0	1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						1,3-DNB	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						2,4,6-TNT	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						2,4-DNT	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						HMX	.001	mg/L	U	N	Y	U	U						E045-01R	18:48
						NITROBENZENE	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						RDX	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
						TETRYL	.0004	mg/L	U	N	Y	U	U						E045-01R	18:48
YE2003	SW8330	METHOD	N	0	1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						1,3-DNB	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						2,4,6-TNT	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						2,4-DNT	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						HMX	.001	mg/L	U	N	Y	U	U						E045-02R	20:05
						NITROBENZENE	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 21 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
															1	2	3	4		
10138Q-05																				
YE2003	SW8330	METHOD	N	0	1	RDX	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
						TETRYL	.0004	mg/L	U	N	Y	U	U						E045-02R	20:05
YE2006	SW8330	METHOD	N	0	1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						1,3-DNB	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						2,4,6-TNT	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						2,4-DNT	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						HMX	.001	mg/L	U	N	Y	U	U						E045-03R	20:44
						NITROBENZENE	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						RDX	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
						TETRYL	.0004	mg/L	U	N	Y	U	U						E045-03R	20:44
YE2007	SW8330	METHOD	N	0	1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						1,3-DNB	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						2,4,6-TNT	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						2,4-DNT	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						HMX	.001	mg/L	U	N	Y	U	U						E045-04R	21:22
						NITROBENZENE	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						RDX	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
						TETRYL	.0004	mg/L	U	N	Y	U	U						E045-04R	21:22
YE2008	SW8330	METHOD	N	0	1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00
						1,3-DNB	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00
						2,4,6-TNT	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00
						2,4-DNT	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00
						2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00
						2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00
						2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00
						3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00
						4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00
						4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U						E045-05R	22:00

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 26, 2002

Page: 22 of 22

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:	
	1	2													3	4					
10138Q-05																					
YE2008	SW8330	METHOD	N	0	1	HMX	.001	mg/L	U	N	Y	U	U							E045-05R	22:00
						NITROBENZENE	.0004	mg/L	U	N	Y	U	U							E045-05R	22:00
						RDX	.0004	mg/L	U	N	Y	U	U							E045-05R	22:00
						TETRYL	.0004	mg/L	U	N	Y	U	U							E045-05R	22:00
YE2002	E314.0	NONE	N	0	1	PERCHLORATE	.005	mg/L	U	N	Y	U	U							E045-01	02:27
YE2003	E314.0	NONE	N	0	1	PERCHLORATE	.005	mg/L	U	N	Y	U	U							E045-02	02:44
YE2006	E314.0	NONE	N	0	1	PERCHLORATE	.005	mg/L	U	N	Y	U	U							E045-03	03:01
YE2007	E314.0	NONE	N	0	1	PERCHLORATE	.005	mg/L	U	N	Y	U	U							E045-04	05:18
YE2008	E314.0	NONE	N	0	1	PERCHLORATE	.005	mg/L	U	N	Y	U	U							E045-05	06:10
10138Q-06																					
YE2006R	SW6010B	SW3010	N	0	1	LEAD	.00437	mg/L	J	Y	Y		J		15					A039-02	13:04
YE2007R	SW6010B	SW3010	N	0	1	LEAD	.00321	mg/L	J	Y	Y		J		15					A039-03	13:10
YE2008R	SW6010B	SW3010	N	0	1	LEAD	.002	mg/L	J	Y	Y		J		15					A039-04	13:15

Quality Assurance Report
For Site Investigation Performed at Artillery and Mortar Impact Areas
South of Bains Gap Road
Parcel HR-139Q
IT Project No 796887
Fort McClellan Quality Assurance Report

1.0 Overview

Five soil samples, one sediment sample and one surface water sample were collected in support of the investigation at Fort McClellan (FTMC) Parcel HR-139Q, Artillery and Mortar Impact Areas South of Bains Gap Road. All samples were submitted to EMAX Laboratories, Inc. for analysis. QC samples consisted of the following types and quantities: 1 field duplicate and 2 equipment rinsates. An analytical summary table cross-referencing sample location, sample number, and contaminants of concern is presented in Attachment A.

One hundred (100%) percent of samples were validated and reviewed in accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Evaluating Inorganic Data Review (EPA, February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines for Organic Review (EPA, October 1999)* for all areas except blanks. *Region III Laboratory Data Validation Functional Guidelines for Inorganic Analyses (EPA, April 1993)* and *Region III National Functional Guidelines for Organic Data Review (EPA, June 1992)* were applied to the areas associated with blank contamination. Data qualifiers assigned to results were based on guidance outlined in the referenced documents and the *Installation-Wide Sampling and Analysis Plan (IT, March 2000)* for FTMC.

Table 1.0-1
Laboratory Data Qualifier Definitions

Data Qualifier	Laboratory Data Qualifier Definition
B	Analyte detected in method blank at concentration greater than the reporting limit (and greater than zero).
C	Confirming data obtained using second GC column or GC/MS.
E	Analyte concentration exceeded calibration range.
I	Analyte identification suspect. See narrative for explanation.
J	Result is less than or equal to specified reporting limit but greater than the method detection limit (MDL).
P	Analyte not confirmed. Results from primary and secondary GC columns differ by greater than 10 percent
S	Analyte concentration obtained using Method of Standard Additions (MSA).
U	Not detected. The value represented indicates the reporting limit for the analysis.
D	Sample analyzed as a dilution. The result reported has been calculated using the appropriate dilution factor.
No Code	Confirmed identification.

**Table 1.0-2
Validation Data Qualifier Definitions**

Validation Qualifier	Validation Data Qualifier Definition
U	Not detected. The associated number indicates approximate sample concentration necessary to be detected.
No Code	Confirmed identification.
B	Not detected substantially above the level reported in laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
N	Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise. Considered an estimate.
NJ	Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.
NV	Result was not validated.

The Data Validation Summary Report is presented in Attachment B.

2.0 Summary

Data were evaluated to verify compliance with precision, accuracy, representativeness, comparability, completeness, and sensitivity. To verify that project data quality objectives (DQOs) were met, laboratory analytical results and data packages were examined for compliance with SW846 8330, 6010B/7470A/7471A, 9060 and Environmental Protection Agency (EPA) 314.0 quality control (QC) method criteria. Laboratory nonconformances and discrepancies in the data were also examined to determine their impact on the data. The results of this review are presented in the following sections.

2.1 Sample Receipt and Analytical Holding Times

All sample results generated by the laboratory during this investigation have been reviewed with respect to condition of samples as received by the laboratory, chain-of-custody, and analysis holding times. All coolers were received by EMAX in good condition under proper chain-of-custody.

All extraction and analytical holding times were met.

2.2 Rejected Data

No data were qualified by the laboratory or after validation was completed as being rejected ("R"-flagged).

2.3 Blank Results

Descriptions of the types of blank samples which were collected, processed, and evaluated for background and/or process contamination during this sampling are as follows:

- Equipment rinsates (ER) are samples of analyte-free deionized water poured into, over, or pumped through the sampling device, collected in a sample container, and transported to the laboratory for analysis. Equipment rinsates are used to assess the effectiveness of equipment decontamination procedures.
- Method blanks (MB) are used in the laboratory to assess and document any possible contamination resulting from the analytical process. A method blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank shall be carried through the complete sample preparation and analytical procedure.
- Initial and continuing calibration blanks (ICB and CCB) are instrument blanks consisting of an analyte-free matrix. ICBs and CCBs are analyzed to verify the analysis system is free of contamination and are analyzed immediately after the initial and continuing calibrations are performed.

Field sample concentrations were evaluated to determine if the sample results could have been biased by the presence of any contamination measured in equipment rinsate blanks, method blanks and/or initial/continuing calibration blanks. Sample data affected by blank contamination are summarized in Table 2.3-1.

**Table 2.3-1
Summary of Blank Contamination**

Sample Delivery Group	Sample Number	Contaminant	Action
10139Q-01	YG0001, YG0002, YG0003 and YG0005	Cobalt	Cobalt results for samples YG0001, YG0002, YG0003 and YG0005 were "B" qualified due to ICB/CCB and MB contamination.
	YG0003	Potassium	Potassium result for sample YG0003 was "B" qualified due to ICB/CCB and MB contamination.
	YG0002 and YG0005	Silver	Silver results for samples YG0002 and YG0005 were "B" qualified due to ICB/CCB contamination.
10139Q-02	YG1001	Beryllium Cobalt	Beryllium and Cobalt results for sample YG1001 were "B" qualified due to ICB/CCB contamination.

2.4 Analytical Precision

Precision is defined as a measurement of mutual agreement among individual measurements of the same property, usually under "prescribed similar conditions." Analytical precision is calculated as relative percent difference (%RPD) based on the following formula:

$$\%RPD = \left| \frac{(A-B)}{(A+B)/2} \right| \times 100$$

where:

%RPD = Relative Percent Difference
 A = original result
 B = duplicate result

A high RPD between an original sample and its field duplicate may be attributable to the difference in sample matrix or distribution of the contaminant within the sample, rather than the precision of the collection process. Also, when "estimated" results are reported, there is a potential for increased variability between the primary and duplicate sample results. This occurs because, at low concentrations, the relative difference in results is magnified by the RPD calculation even though the results are comparable in absolute terms. There is also increased uncertainty in the results as the lower limit of detection is approached, due to decreasing analytical accuracy. The RPD calculation cannot be performed in cases where non-detected results are reported with corresponding samples that contain detectable concentrations.

Overall sampling and analysis precision for this task was assessed using field duplicate (FD) samples. Laboratory precision was assessed by laboratory control sample/laboratory control sample duplicate (LCS/LCSD) and matrix spike/matrix spike duplicate (MS/MSD) recoveries. Results indicate that an acceptable analytical precision was achieved. Table 2.4-1 lists precision acceptance criteria for LCS/LCSD, MS/MSD organic analyses and field duplicate comparisons.

Table 2.4-1 Precision Acceptance Criteria

Field/Laboratory QC Type	Matrix	
	Aqueous	Soil
Field Duplicate (Both Organic & Inorganic)	RPD < 35%	RPD < 50%
Perchlorate LCS/LCSD and MS/MSD	RPD < 10%	RPD < 20%
Nitroaromatic and Nitramine Explosives LCS/LCSD and MS/MSD	Refer to Table 8-1 of FTMC "Installation Wide Sample and Analysis Plan"	Refer to Table 8-1 of FTMC "Installation Wide Sample and Analysis Plan"
Metals LCS/LCSD and MS/MSD	RPD < 20%	RPD < 20%

2.5 Analytical Accuracy Assessment

Accuracy is a measure of the degree of agreement of a result against an accepted reference or true value. Accuracy is expressed as a percent recovery (%R) calculated by the ratio of the measurement and accepted true value as shown in the following equation:

$$\%R = (|X_s - X_u|/K) \times 100$$

where:

- X_s = measured value of the spiked sample
- X_u = measured value of the unspiked sample
- K = known amount of the spike in the sample

Surrogate recoveries, MS/MSD and LCS/LCSD were used to measure analytical accuracy as described in SW846 8330, 6010B/7470A/7471A, 9060 and EPA 314.0. Reported results indicate that an acceptable level of analytical accuracy was achieved. Surrogate, LCS/LCSD and MS/MSD spike recoveries, which exceed QC criteria are summarized in Table 2.5-1.

Table 2.5-1
Summary of Surrogate, LCS/LCSD and MS/MSD Spike Recovery Criteria Exceedances

Sample Delivery Group	Sample Number	Contaminant	Action
10139Q-01	YG0001, YG0002, YG0003, YG0004 and YG0005	Antimony (LB)	Antimony results for samples YG0001 through YG0005 were "J" / "UJ" qualified due to MS/MSD spike recoveries exceeding QC criteria.

LB - Low bias

2.6 Data Representativeness

Representativeness is a qualitative parameter that expresses the degree to which sample data actually represent the matrix conditions. Standardized requirements and procedures for sample collection, handling and analyses were employed to maximize sample representativeness.

Sample locations selected for this investigation will confirm whether contaminant releases into the environment have occurred and if contaminated soil exists at this parcel.

2.7 Data Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. By employing well-recognized techniques and accepted standardized methods for sampling and analysis, data comparability was achieved during this sampling event.

2.8 Data Completeness

Completeness is calculated for the aggregation of data for each analyte measured during the investigation of Parcel HR-139Q, Artillery and Mortar Impact Areas South of Bains Gap Road. The formula for calculating completeness is listed below:

$$\% \text{ Completeness} = (X_V / X_T) \times 100$$

where:

X_V = number of valid (i.e., non-"R"-flagged) results

X_T = number of possible results

Parcel HR-139Q goal for completeness is 95% for both aqueous and soil samples. The % Completeness for this task is calculated to be 100%.

- $\% \text{ Completeness} = (267 / 267) \times 100 = 100\%$

2.9 Sensitivity

Sensitivity is defined as the ability of the laboratory's established method detection limits (MDL)/method reporting limits (MRL or RL) to meet project-specific DQOs or site-specific screening levels (SSSL) and or ecological screening values (ESV).

MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. MDLs are determined from an analysis of a sample in a given matrix containing the target analyte of interest. The MRL is a threshold value based upon the sensitivity capability of method and instrument. MRLs are normally set at a minimum of two times the MDL. MRLs are adjusted based on the sample matrix, moisture (solids only), and any necessary sample dilutions. The laboratory cannot reliably quantitate values reported above the MDL but below the MRL. Therefore, these analyte values must be flagged as estimated quantities ("J"-flagged).

To evaluate method sensitivity, a general comparison of the laboratory's MDLs/MRLs and the site investigation screening levels (background values, human health SSSL for residential reuse, and ESV) was performed and presented to the FTMC Base Realignment and Closure Team (BCT)

(November 1999). The comparison summarized the relationship between the MDL/MRLs and SSSL/ESVs for each parameter typically reported for all of the major analytical methods used at FTMC. The few cases identified where the MDL and/or MRL values exceeded their corresponding human health SSSL and/or ESV were specifically highlighted and explained. It was understood that for these cases, the standard analytical method of analysis was not going to provide MDLs/MRLs, which met human health SSSLs or ESVs without significant uncertainty and the possibility of reporting false negatives. It was generally accepted that standard EPA SW846 analytical methods would provide sufficient sensitivity for data reported and used in the site screening process at FTMC.

3.0 Data Usability

Data quality indicators (DQI) provide an internal guide for control and review to verify that data are scientifically sound, defensible, and of known and acceptable quality. Factors such as precision, accuracy, representativeness, comparability, completeness, and sensitivity were evaluated to determine if the project's DQOs were met. A review of the data revealed that the majority of QA/QC indicators were within acceptable control limits. Any data anomalies encountered during data validation and overall site evaluations have been summarized in the previous sections of this document.

Based on the results of data validation and QA review, IT has concluded that representative samples were collected and analyzed and the results are indicative of the media analyzed. The data are to be considered representative of site conditions and are usable for their intended purpose.

4.0 Attachments

Attachment A - Analytical Summary Table

Attachment B - Data Validation Summary Report

ATTACHMENT A
ANALYTICAL SUMMARY TABLE

Ft. McClellan
Parcel HR-139Q
Artillery and Mortar Impact Areas South of Bains Gap Road
Analytical Summary
Project No. 796887

HR-139Q Soil Sampling

Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-139Q-GP01	HR-139Q-GP01-SS-YG0001-REG	YG0001	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-139Q-GP01-DS-YG0002-REG	YG0002	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-139Q-GP02	HR-139Q-GP02-SS-YG0003-REG	YG0003	07-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-139Q-GP02-DS-YG0004-REG	YG0004	07-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-139Q-GP02-DS-YG0005-FD	YG0005	07-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.

HR-139Q Sediment and Surface Water Sampling

Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-139Q-SD/SW01	HR-139Q-SD/SW01-SD-YG1001-REG	YG1001	25-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330, Perchlorate by EPA 314.0 and Total Organic Carbon by SW9060.
	HR-139Q-SD/SW01-SW-YG2001-REG	YG2001	25-Apr-01	TAL Metals by SW6010B/SW7470, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.

ATTACHMENT B
DATA VALIDATION SUMMARY REPORT

**Data Validation Summary Report
For the Site Investigation Performed at the
“Artillery and Motor Impact Areas South of Bains Gap” (Parcel HR-139Q)
Fort McClellan, Calhoun County, Alabama**

1.0 Introduction

Level III data validation was performed on 100% of the environmental samples collected for CK10 (Parcel HR-139Q). The analytical data consisted of three sample delivery groups (SDG), 10139Q-01, 10139Q-02, and 10139Q-03, which were analyzed by EMAX Laboratories. The chemical parameters for which the samples were analyzed and validated are identified below:

Parameter (Method)
TAL Metals by SW846 6010B/7470A/7471A
Nitroaromatic and Nitramine Explosives by SW846 8330
Perchlorate by EPA 314.0 and Total Organic Carbon (TOC) by SW846 9060

2.0 Procedures

The sample data were validated following the logic identified in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines For Inorganic Data Review (February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines For Organic Review (October 1999)* for all areas except Blanks. *Region III Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses (April 1993)* and *Region III National Functional Guidelines for Organic Data Review (June 1992)* were applied to the areas associated with blank contamination. Specific quality control (QC) criteria, as identified in the Quality Assurance Plan (QAP), analytical methods, and laboratory Standard Operating Procedures (SOP's) were applied to all sample results. As the result of the use of Update III SW846 test methods for the analytical data and the application of the CLP guidelines during the validation process, there were instances where specific QC requirements for all target compounds were not defined. This primarily occurred in the organic, Gas Chromatograph (GC) and Gas Chromatograph/Mass Spectra (GC/MS) calibration areas and is due to the fact that the analytical methods are performance-based, and allows the use of average calibration responses, in lieu of, individual responses, which are defined by CLP protocol. In light of applying CLP guidelines to SW846 methods and evaluating the usability of the data during the validation process, specific QC criteria were determined to address all target compounds and are identified in this report for each parameter, as well as, in the validation checklists, which function as worksheets. All completed validation checklists are on file in the Knoxville office.

For those analytical methods not addressed by the CLP and Region III guidelines, the validation was based on the method requirements (i. e. SW846, CFR, SOP's) and technical judgement, following the logic of the CLP validation guidelines.

3.0 Summary of Data Validation Findings

The overall quality of the data was determined to be acceptable with minimal qualifications. No data were rejected.

Individual validation reports have been prepared for each parameter and the overall results of the validation findings are summarized in this report. The validation qualifier data entry verification report (Attachment A) is also provided. This is a complete listing of all of the analytical results and the validation qualifiers assigned for HR-139Q. It also identifies the "use" column, which indicates which result to use in the event of a reanalysis. A listing of the validation qualifiers and the reason codes, along with their definitions are also found in Attachment A. The following section highlights the key findings of the data validation for each analysis.

4.0 Analysis-Specific Data Validation Summaries

4.1 Metals by SW-846 6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Preservation

All samples were properly preserved.

Initial and Continuing Calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were found to be acceptable with the exception of the following:

SDG Number	Sample Number	Compound	Blank Contaminant	Validation Qualifier
10139Q-01	YG0001, YG0002, YG0003, YG0005	Cobalt	Calibration/Method	B
	YG0003	Potassium	Calibration/Method	B
	YG0002, YG0005	Silver	Calibration	B
10139Q-02	YG1001	Beryllium, Cobalt	Calibration	B

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met with the exception of the following, which exhibited recovery and/or RPD problems:

SDG Number	Sample Number	Compound	Validation Qualifier
10139Q-01	YG0001, YG0002, YG0003, YG0004, YG0005	Antimony	J/UJ

Laboratory Control Sample (LCS)

LCS was performed for the project samples and all QC criteria were met.

Interference Check Sample (ICS)

All ICS % recoveries were acceptable. All QC criteria were met.

ICP Serial Dilutions

All QC criteria were met for the serial dilutions associated with the project samples with the exception of the following:

SDG Number	Sample Number	Compound	Validation Qualifier
10139Q-01	YG0001, YG0002, YG0003, YG0004, YG0005	Chromium, Vanadium	J

Field Duplicates

Original and field duplicate results were evaluated and all QC criteria were met.

Quantitation

Results quantitated between the IDL and the RL ("B" flagged by the laboratory) were qualified as estimated (J).

4.2 Nitroaromatic and Nitramine Explosives by SW846 8330

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as J, were qualified as estimated J unless blank contamination was present or the results were rejected.

4.3. Perchlorates by EPA 314.0 and TOC by SW846 9060

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples. All was acceptable no qualification was necessary.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable, no qualification was necessary.

Matrix Spike / Matrix Spike Duplicate

MS/MSD were performed for the project samples, and all QC criteria were met. No qualification was necessary.

Laboratory Control Sample

Laboratory Control Sample (LCS) was performed for the project samples and all QC criteria were met. No qualification was necessary.

Field Duplicates

Original and field duplicate results were evaluated and no problems were noted.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as "J," were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

Validation Qualifiers

- U Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.
- J The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.
- B The concentration reported was detected significantly above the levels reported in the associated equipment rinse samples and/or laboratory method and trip blanks. (5X/10X Rule was applied).
- R The reported sample results are rejected due to the following:
1. Severe deficiencies in the supporting quality control data.
 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data.
 3. The presence or absence of the constituent cannot be verified based on the data provided.
 4. To indicate not to use a particular result in the event of a reanalysis.
- UJ The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the “nondetect” may be inaccurate or imprecise. The nondetect result should be estimated.

Validation Reason Code Definitions

Reason Code	Description
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 1 of 7

Sample Number:	Analytical/Extraction Method:		Flt	REX Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
												Qlfr	Code:	1	2	3	4			
10139Q-01																				
YG0001	SW6010B	SW3050	N	0	1	ALUMINUM	7810	mg/kg		Y	Y	P							B102-01	18:03
						ANTIMONY	12.1	mg/kg	U	N	Y	U	UJ	08A					B102-01	18:03
						ARSENIC	5.52	mg/kg		Y	Y	P							B102-01	16:10
						BARIIUM	43.1	mg/kg		Y	Y	P							B102-01	18:03
						BERYLLIUM	.565	mg/kg	J	Y	Y	P	J	15					B102-01	18:03
						CADMIUM	.605	mg/kg	U	N	Y	U	U						B102-01	18:03
						CALCIUM	306	mg/kg		Y	Y	P							B102-01	18:03
						CHROMIUM	6.03	mg/kg		Y	Y	P	J	13					B102-01	18:03
						COBALT	1.63	mg/kg	J	Y	Y	F	B	06A	06B				B102-01	18:03
						COPPER	8.07	mg/kg		Y	Y	P							B102-01	18:03
						IRON	8920	mg/kg		Y	Y	P							B102-01	18:03
						LEAD	6.47	mg/kg		Y	Y	P							B102-01	16:10
						MAGNESIUM	344	mg/kg		Y	Y	P							B102-01	18:03
						MANGANESE	98.3	mg/kg		Y	Y	P							B102-01	18:03
						NICKEL	2.82	mg/kg		Y	Y	P							B102-01	18:03
						POTASSIUM	2890	mg/kg		Y	Y	P							B102-01	18:03
						SELENIUM	1.21	mg/kg	U	N	Y	U	U						B102-01	16:10
						SILVER	1.21	mg/kg	U	N	Y	U	U						B102-01	18:03
						SODIUM	121	mg/kg	U	N	Y	U	U						B102-01	18:03
						THALLIUM	2.42	mg/kg	U	N	Y	U	U						B102-01	16:10
						VANADIUM	9.44	mg/kg		Y	Y	P	J	13					B102-01	18:03
						ZINC	7.64	mg/kg		Y	Y	P							B102-01	18:03
	SW7471A	TOTAL	N	0	1	MERCURY	.027	mg/kg	J	Y	Y	P	J	15					B102-01	14:26
YG0002	SW6010B	SW3050	N	0	1	ALUMINUM	8640	mg/kg		Y	Y	P							B102-02	18:07
						ANTIMONY	11.9	mg/kg	U	N	Y	U	UJ	08A					B102-02	18:07
						ARSENIC	5.01	mg/kg		Y	Y	P							B102-02	16:15
						BARIIUM	33.6	mg/kg		Y	Y	P							B102-02	18:07
						BERYLLIUM	.672	mg/kg	J	Y	Y	P	J	15					B102-02	18:07
						CADMIUM	.594	mg/kg	U	N	Y	U	U						B102-02	18:07
						CALCIUM	28.1	mg/kg	J	Y	Y	P	J	15					B102-02	18:07
						CHROMIUM	8.39	mg/kg		Y	Y	P	J	13					B102-02	18:07
						COBALT	.834	mg/kg	J	Y	Y	F	B	06A	06B				B102-02	18:07
						COPPER	12.1	mg/kg		Y	Y	P							B102-02	18:07
						IRON	12700	mg/kg		Y	Y	P							B102-02	18:07
						LEAD	4.28	mg/kg		Y	Y	P							B102-02	16:15
						MAGNESIUM	343	mg/kg		Y	Y	P							B102-02	18:07
						MANGANESE	6.4	mg/kg		Y	Y	P							B102-02	18:07
						NICKEL	2.68	mg/kg		Y	Y	P							B102-02	18:07
						POTASSIUM	3770	mg/kg		Y	Y	P							B102-02	18:07
						SELENIUM	1.19	mg/kg	U	N	Y	U	U						B102-02	16:15

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 2 of 7

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10139Q-01																					
YG0002	SW6010B	SW3050	N	0	1	SILVER	.506	mg/kg	J	Y	Y	F	B			06B				B102-02	18:07
						SODIUM	119	mg/kg	U	N	Y	U	U							B102-02	18:07
						THALLIUM	2.38	mg/kg	U	N	Y	U	U							B102-02	16:15
						VANADIUM	10.6	mg/kg		Y	Y	P	J			13				B102-02	18:07
						ZINC	6.71	mg/kg		Y	Y	P								B102-02	18:07
	SW7471A	TOTAL	N	0	1	MERCURY	.119	mg/kg	U	N	Y	U	U							B102-02	14:29
YG0003	SW6010B	SW3050	N	0	1	ALUMINUM	9250	mg/kg		Y	Y	P								B093-01	18:48
						ANTIMONY	13	mg/kg	U	N	Y	U	UJ			08A				B093-01	18:48
						ARSENIC	3.97	mg/kg		Y	Y	P								B093-01	16:53
						BARIIUM	83.6	mg/kg		Y	Y	P								B093-01	18:48
						BERYLLIUM	.522	mg/kg	J	Y	Y	P	J			15				B093-01	18:48
						CADMIUM	.652	mg/kg	U	N	Y	U	U							B093-01	18:48
						CALCIUM	496	mg/kg		Y	Y	P								B093-01	18:48
						CHROMIUM	6.31	mg/kg		Y	Y	P	J			13				B093-01	18:48
						COBALT	1.55	mg/kg	J	Y	Y	F	B			06A				B093-01	18:48
						COPPER	7.35	mg/kg		Y	Y	P								B093-01	18:48
						IRON	7900	mg/kg		Y	Y	P								B093-01	18:48
						LEAD	32.9	mg/kg		Y	Y	P								B093-01	16:53
						MAGNESIUM	325	mg/kg		Y	Y	P								B093-01	18:48
						MANGANESE	134	mg/kg		Y	Y	P								B093-01	18:48
						NICKEL	3.07	mg/kg		Y	Y	P								B093-01	18:48
						POTASSIUM	344	mg/kg	J	Y	Y	F	B			06A 06B				B093-01	18:48
						SELENIUM	1.3	mg/kg	U	N	Y	U	U							B093-01	16:53
						SILVER	1.3	mg/kg	U	N	Y	U	U							B093-01	18:48
						SODIUM	45.1	mg/kg	J	Y	Y	P	J			15				B093-01	18:48
						THALLIUM	2.61	mg/kg	U	N	Y	U	U							B093-01	16:53
						VANADIUM	11	mg/kg		Y	Y	P	J			13				B093-01	18:48
						ZINC	26.6	mg/kg		Y	Y	P								B093-01	18:48
	SW7471A	TOTAL	N	0	1	MERCURY	.095	mg/kg	J	Y	Y	P	J			15				B093-01	14:19
YG0004	SW6010B	SW3050	N	0	1	ALUMINUM	11000	mg/kg		Y	Y	P								B093-02	18:12
						ANTIMONY	4.86	mg/kg	J	Y	Y	P	J			08A 15				B093-02	18:12
						ARSENIC	5.42	mg/kg		Y	Y	P								B093-02	16:19
						BARIIUM	24.4	mg/kg		Y	Y	P								B093-02	18:12
						BERYLLIUM	.389	mg/kg	J	Y	Y	P	J			15				B093-02	18:12
						CADMIUM	.62	mg/kg	U	N	Y	U	U							B093-02	18:12
						CALCIUM	17	mg/kg	J	Y	Y	P	J			15				B093-02	18:12
						CHROMIUM	8.17	mg/kg		Y	Y	P	J			13				B093-02	18:12
						COBALT	2.48	mg/kg	U	N	Y	U	U							B093-02	18:12
						COPPER	10.2	mg/kg		Y	Y	P								B093-02	18:12
						IRON	6740	mg/kg		Y	Y	P								B093-02	18:12

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 3 of 7

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10139Q-01																					
YG0004	SW6010B	SW3050	N	0	1	LEAD	6.89	mg/kg		Y	Y	P								B093-02	16:19
						MAGNESIUM	389	mg/kg		Y	Y	P								B093-02	18:12
						MANGANESE	2.75	mg/kg		Y	Y	P								B093-02	18:12
						NICKEL	1.05	mg/kg	J	Y	Y	P	J		15					B093-02	18:12
						POTASSIUM	3300	mg/kg		Y	Y	P								B093-02	18:12
						SELENIUM	1.24	mg/kg	U	N	Y	U	U							B093-02	16:19
						SILVER	1.24	mg/kg	U	N	Y	U	U							B093-02	18:12
						SODIUM	37.5	mg/kg	J	Y	Y	P	J		15					B093-02	18:12
						THALLIUM	2.48	mg/kg	U	N	Y	U	U							B093-02	16:19
						VANADIUM	15.7	mg/kg		Y	Y	P	J		13					B093-02	18:12
						ZINC	4.19	mg/kg		Y	Y	P								B093-02	18:12
	SW7471A	TOTAL	N	0	1	MERCURY	.124	mg/kg	U	N	Y	U	U							B093-02	14:22
YG0005	SW6010B	SW3050	N	0	1	ALUMINUM	10500	mg/kg		Y	Y									B093-03	18:16
						ANTIMONY	12.4	mg/kg	U	N	Y		UJ		08A					B093-03	18:16
						ARSENIC	6.24	mg/kg		Y	Y									B093-03	16:23
						BARIUM	25.2	mg/kg		Y	Y									B093-03	18:16
						BERYLLIUM	.396	mg/kg	J	Y	Y		J		15					B093-03	18:16
						CADMIUM	.619	mg/kg	U	N	Y		U							B093-03	18:16
						CALCIUM	17.1	mg/kg	J	Y	Y		J		15					B093-03	18:16
						CHROMIUM	8.37	mg/kg		Y	Y		J		13					B093-03	18:16
						COBALT	.528	mg/kg	J	Y	Y	F	B		06A	06B				B093-03	18:16
						COPPER	10.6	mg/kg		Y	Y									B093-03	18:16
						IRON	6980	mg/kg		Y	Y									B093-03	18:16
						LEAD	6.25	mg/kg		Y	Y									B093-03	16:23
						MAGNESIUM	369	mg/kg		Y	Y									B093-03	18:16
						MANGANESE	2.52	mg/kg		Y	Y									B093-03	18:16
						NICKEL	2.48	mg/kg	U	N	Y		U							B093-03	18:16
						POTASSIUM	3620	mg/kg		Y	Y									B093-03	18:16
						SELENIUM	1.24	mg/kg	U	N	Y		U							B093-03	16:23
						SILVER	.55	mg/kg	J	Y	Y	F	B		06B					B093-03	18:16
						SODIUM	32.1	mg/kg	J	Y	Y		J		15					B093-03	18:16
						THALLIUM	.739	mg/kg	J	Y	Y		J		15					B093-03	16:23
						VANADIUM	16.9	mg/kg		Y	Y		J		13					B093-03	18:16
						ZINC	3.99	mg/kg		Y	Y									B093-03	18:16
	SW7471A	TOTAL	N	0	1	MERCURY	.124	mg/kg	U	N	Y		U							B093-03	14:24
YG0001	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B102-01	05:05
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B102-01	05:05
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B102-01	05:05
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B102-01	05:05
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B102-01	05:05

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 4 of 7

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10139Q-01																	
YG0001	SW8330	METHOD	N 0 1	2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B102-01	05:05
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B102-01	05:05
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B102-01	05:05
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B102-01	05:05
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B102-01	05:05
				HMX	.4	mg/kg	U	N	Y	U	U					B102-01	05:05
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B102-01	05:05
				RDX	.4	mg/kg	U	N	Y	U	U					B102-01	05:05
				TETRYL	.4	mg/kg	U	N	Y	U	U					B102-01	05:05
YG0002	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				HMX	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				RDX	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
				TETRYL	.4	mg/kg	U	N	Y	U	U					B102-02	05:46
YG0003	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				HMX	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				RDX	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
				TETRYL	.4	mg/kg	U	N	Y	U	U					B093-01	03:04
YG0004	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					B093-02	03:44

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 5 of 7

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10139Q-01																	
YG0004	SW8330	METHOD	N 0 1	2,4-DNT	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				HMX	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				RDX	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
				TETRYL	.4	mg/kg	U	N	Y	U	U					B093-02	03:44
YG0005	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y		U					B093-03	04:25
				1,3-DNB	.4	mg/kg	U	N	Y		U					B093-03	04:25
				2,4,6-TNT	.4	mg/kg	U	N	Y		U					B093-03	04:25
				2,4-DNT	.4	mg/kg	U	N	Y		U					B093-03	04:25
				2,6-DNT	.4	mg/kg	U	N	Y		U					B093-03	04:25
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y		U					B093-03	04:25
				2-NITROTOLUENE	.4	mg/kg	U	N	Y		U					B093-03	04:25
				3-NITROTOLUENE	.4	mg/kg	U	N	Y		U					B093-03	04:25
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y		U					B093-03	04:25
				4-NITROTOLUENE	.4	mg/kg	U	N	Y		U					B093-03	04:25
				HMX	.4	mg/kg	U	N	Y		U					B093-03	04:25
				NITROBENZENE	.4	mg/kg	U	N	Y		U					B093-03	04:25
				RDX	.4	mg/kg	U	N	Y		U					B093-03	04:25
				TETRYL	.4	mg/kg	U	N	Y		U					B093-03	04:25
YG0001	EPA314.0	NONE	N 0 1	PERCHLORATE	.0605	mg/kg	U	N	Y	U	U					B102-01	21:44
YG0002	EPA314.0	NONE	N 0 1	PERCHLORATE	.0594	mg/kg	U	N	Y	U	U					B102-02	22:01
YG0003	EPA314.0	NONE	N 0 1	PERCHLORATE	.0652	mg/kg	U	N	Y	U	U					B093-01	20:18
YG0004	EPA314.0	NONE	N 0 1	PERCHLORATE	.062	mg/kg	U	N	Y	U	U					B093-02	21:10
YG0005	EPA314.0	NONE	N 0 1	PERCHLORATE	.0619	mg/kg	U	N	Y		U					B093-03	21:27
10139Q-02																	
YG1001	SW6010B	SW3050	N 0 1	ALUMINUM	6130	mg/kg		Y	Y	P						D262-01	23:16
				ANTIMONY	12	mg/kg	U	N	Y	U	U					D262-01	23:16
				ARSENIC	3.78	mg/kg		Y	Y	P						D262-01	23:06
				BARIUM	64.2	mg/kg		Y	Y	P						D262-01	23:16
				BERYLLIUM	.771	mg/kg	J	Y	Y	F	B		06B			D262-01	23:16
				CADMIUM	.602	mg/kg	U	N	Y	U	U					D262-01	23:16
				CALCIUM	123	mg/kg		Y	Y	P						D262-01	23:16
				CHROMIUM	5.99	mg/kg		Y	Y	P						D262-01	23:16

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 6 of 7

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10139Q-02																					
YG1001	SW6010B	SW3050	N	0	1	COBALT	3.78	mg/kg		Y	Y	F	B			06B				D262-01	23:16
						COPPER	2.07	mg/kg	J	Y	Y	P	J			15				D262-01	23:16
						IRON	25400	mg/kg		Y	Y	P								D262-01	23:16
						LEAD	5.09	mg/kg		Y	Y	P								D262-01	23:06
						MAGNESIUM	276	mg/kg		Y	Y	P								D262-01	23:16
						MANGANESE	267	mg/kg		Y	Y	P								D262-01	23:16
						NICKEL	3.92	mg/kg		Y	Y	P								D262-01	23:16
						POTASSIUM	1610	mg/kg		Y	Y	P								D262-01	23:16
						SELENIUM	1.2	mg/kg	U	N	Y	U	U							D262-01	23:06
						SILVER	1.2	mg/kg	U	N	Y	U	U							D262-01	23:16
						SODIUM	120	mg/kg	U	N	Y	U	U							D262-01	23:16
						THALLIUM	2.41	mg/kg	U	N	Y	U	U							D262-01	23:06
						VANADIUM	10.4	mg/kg		Y	Y	P								D262-01	23:16
						ZINC	12.6	mg/kg		Y	Y	P								D262-01	23:16
	SW7471A	TOTAL	N	0	1	MERCURY	.12	mg/kg	U	N	Y	U	U							D262-01	15:21
YG1001	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						HMX	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						RDX	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
						TETRYL	.4	mg/kg	U	N	Y	U	U							D262-01	21:15
YG1001	E314.0	NONE	N	0	1	PERCHLORATE	.0602	mg/kg	U	N	Y	U	U							D262-01	22:46
YG1001	SW9060	NONE	N	0	1	TOC	31.8	mg/kg		Y	Y	P								D262-01	12:10
10139Q-03																					
YG2001	SW6010B	SW3010	N	0	1	ALUMINUM	.376	mg/L		Y	Y	P								D263-01	21:14
						ANTIMONY	.1	mg/L	U	N	Y	U	U							D263-01	21:14
						ARSENIC	.01	mg/L	U	N	Y	U	U							D263-01	20:04
						BARIIUM	.0347	mg/L		Y	Y	P								D263-01	21:14
						BERYLLIUM	.001	mg/L	U	N	Y	U	U							D263-01	21:14
						CADMIUM	.01	mg/L	U	N	Y	U	U							D263-01	21:14
						CALCIUM	.275	mg/L	J	Y	Y	P	J			15				D263-01	21:14

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 7 of 7

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10139Q-03																	
YG2001	SW6010B	SW3010	N 0 1	CHROMIUM	.01	mg/L	U	N	Y	U	U					D263-01	21:14
				COBALT	.02	mg/L	U	N	Y	U	U					D263-01	21:14
				COPPER	.02	mg/L	U	N	Y	U	U					D263-01	21:14
				IRON	.406	mg/L		Y	Y	P						D263-01	21:14
				LEAD	.01	mg/L	U	N	Y	U	U					D263-01	20:04
				MAGNESIUM	.312	mg/L	J	Y	Y	P	J		15			D263-01	21:14
				MANGANESE	.0426	mg/L		Y	Y	P						D263-01	21:14
				NICKEL	.02	mg/L	U	N	Y	U	U					D263-01	21:14
				POTASSIUM	2.76	mg/L	J	Y	Y	P	J		15			D263-01	21:14
				SELENIUM	.01	mg/L	U	N	Y	U	U					D263-01	20:04
				SILVER	.01	mg/L	U	N	Y	U	U					D263-01	21:14
				SODIUM	.824	mg/L	J	Y	Y	P	J		15			D263-01	21:14
				THALLIUM	.01	mg/L	U	N	Y	U	U					D263-01	20:04
				VANADIUM	.01	mg/L	U	N	Y	U	U					D263-01	21:14
				ZINC	.00866	mg/L	J	Y	Y	P	J		15			D263-01	21:14
	SW7470A	TOTAL	N 0 1	MERCURY	.0005	mg/L	U	N	Y	U	U					D263-01	11:35
YG2001	SW8330	METHOD	N 0 1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				1,3-DNB	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				2,4,6-TNT	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				2,4-DNT	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				2,6-DNT	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				HMX	.001	mg/L	U	N	Y	U	U					D263-01	04:25
				NITROBENZENE	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				RDX	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
				TETRYL	.0004	mg/L	U	N	Y	U	U					D263-01	04:25
YG2001	E314.0	NONE	N 0 1	PERCHLORATE	.005	mg/L	U	N	Y	U	U					D263-01	17:37

Quality Assurance Report
For Site Investigation Performed at Artillery and Mortar Impact Areas
South of Bains Gap Road
Parcel HR-140Q
IT Project No 796887
Fort McClellan Quality Assurance Report

1.0 Overview

Five soil samples, one sediment sample and one surface water sample were collected in support of the investigation at Fort McClellan (FTMC) Parcel HR-140Q, Artillery and Mortar Impact Areas South of Bains Gap Road. All samples were submitted to EMAX Laboratories, Inc. for analysis. QC samples consisted of the following types and quantities: 1 field duplicate and 2 equipment rinsates. An analytical summary table cross-referencing sample location, sample number, and contaminants of concern is presented in Attachment A.

One hundred (100%) percent of samples were validated and reviewed in accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Evaluating Inorganic Data Review (EPA, February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines for Organic Review (EPA, October 1999)* for all areas except blanks. *Region III Laboratory Data Validation Functional Guidelines for Inorganic Analyses (EPA, April 1993)* and *Region III National Functional Guidelines for Organic Data Review (EPA, June 1992)* were applied to the areas associated with blank contamination. Data qualifiers assigned to results were based on guidance outlined in the referenced documents and the *Installation-Wide Sampling and Analysis Plan (IT, March 2000)* for FTMC.

Table 1.0-1
Laboratory Data Qualifier Definitions

Data Qualifier	Laboratory Data Qualifier Definition
B	Analyte detected in method blank at concentration greater than the reporting limit (and greater than zero).
C	Confirming data obtained using second GC column or GC/MS.
E	Analyte concentration exceeded calibration range.
I	Analyte identification suspect. See narrative for explanation.
J	Result is less than or equal to specified reporting limit but greater than the method detection limit (MDL).
P	Analyte not confirmed. Results from primary and secondary GC columns differ by greater than 10 percent
S	Analyte concentration obtained using Method of Standard Additions (MSA).
U	Not detected. The value represented indicates the reporting limit for the analysis.
D	Sample analyzed as a dilution. The result reported has been calculated using the appropriate dilution factor.
No Code	Confirmed identification.

**Table 1.0-2
Validation Data Qualifier Definitions**

Validation Qualifier	Validation Data Qualifier Definition
U	Not detected. The associated number indicates approximate sample concentration necessary to be detected.
No Code	Confirmed identification.
B	Not detected substantially above the level reported in laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
N	Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise. Considered an estimate.
NJ	Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.
NV	Result was not validated.

The Data Validation Summary Report is presented in Attachment B.

2.0 Summary

Data were evaluated to verify compliance with precision, accuracy, representativeness, comparability, completeness, and sensitivity. To verify that project data quality objectives (DQOs) were met, laboratory analytical results and data packages were examined for compliance with SW846 8330, 6010B/7470A/7471A, 9060 and Environmental Protection Agency (EPA) 314.0 quality control (QC) method criteria. Laboratory nonconformances and discrepancies in the data were also examined to determine their impact on the data. The results of this review are presented in the following sections.

2.1 Sample Receipt and Analytical Holding Times

All sample results generated by the laboratory during this investigation have been reviewed with respect to condition of samples as received by the laboratory, chain-of-custody, and analysis holding times. All coolers were received by EMAX in good condition under proper chain-of-custody.

All extraction and analytical holding times were met.

2.2 Rejected Data

No data were qualified by the laboratory or after validation was completed as being rejected (“R”-flagged).

2.3 Blank Results

Descriptions of the types of blank samples which were collected, processed, and evaluated for background and/or process contamination during this sampling are as follows:

- Equipment rinsates (ER) are samples of analyte-free deionized water poured into, over, or pumped through the sampling device, collected in a sample container, and transported to the laboratory for analysis. Equipment rinsates are used to assess the effectiveness of equipment decontamination procedures.
- Method blanks (MB) are used in the laboratory to assess and document any possible contamination resulting from the analytical process. A method blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank shall be carried through the complete sample preparation and analytical procedure.
- Initial and continuing calibration blanks (ICB and CCB) are instrument blanks consisting of an analyte-free matrix. ICBs and CCBs are analyzed to verify the analysis system is free of contamination and are analyzed immediately after the initial and continuing calibrations are performed.

Field sample concentrations were evaluated to determine if the sample results could have been biased by the presence of any contamination measured in equipment rinsate blanks, method blanks and/or initial/continuing calibration blanks. Sample data affected by blank contamination are summarized in Table 2.3-1.

**Table 2.3-1
Summary of Blank Contamination**

Sample Delivery Group	Sample Number	Contaminant	Action
10140Q-01	YH0001	Cobalt	Cobalt result for sample YH0001 was "B" qualified due to ICB/CCB contamination.
	YH0003	Mercury	Mercury result for sample YH0003 was "B" qualified due to ICB/CCB contamination.
10140Q-02	YH1001	Beryllium	Beryllium result for sample YH1001 was "B" qualified due to ICB/CCB contamination.
10140Q-03	YH2001	Nickel	Nickel result for sample YH2001 was "B" qualified due to ICB/CCB contamination.

2.4 Analytical Precision

Precision is defined as a measurement of mutual agreement among individual measurements of the same property, usually under "prescribed similar conditions." Analytical precision is calculated as relative percent difference (%RPD) based on the following formula:

$$\%RPD = \left| \frac{(A-B)}{(A+B)/2} \right| \times 100$$

where:

%RPD = Relative Percent Difference
 A = original result
 B = duplicate result

A high RPD between an original sample and its field duplicate may be attributable to the difference in sample matrix or distribution of the contaminant within the sample, rather than the precision of the collection process. Also, when "estimated" results are reported, there is a potential for increased variability between the primary and duplicate sample results. This occurs because, at low concentrations, the relative difference in results is magnified by the RPD calculation even though the results are comparable in absolute terms. There is also increased uncertainty in the results as the lower limit of detection is approached, due to decreasing analytical accuracy. The RPD calculation cannot be performed in cases where non-detected results are reported with corresponding samples that contain detectable concentrations.

Overall sampling and analysis precision for this task was assessed using field duplicate (FD) samples. Laboratory precision was assessed by laboratory control sample/laboratory control sample duplicate (LCS/LCSD) and matrix spike/matrix spike duplicate (MS/MSD) recoveries. Results indicate that an acceptable analytical precision was achieved. Table 2.4-1 lists precision acceptance criteria for LCS/LCSD, MS/MSD organic analyses and field duplicate comparisons.

Table 2.4-1 Precision Acceptance Criteria

Field/Laboratory QC Type	Matrix	
	Aqueous	Soil
Field Duplicate (Both Organic & Inorganic)	RPD < 35%	RPD < 50%
Perchlorate LCS/LCSD and MS/MSD	RPD < 10%	RPD < 20%
Nitroaromatic and Nitramine Explosives LCS/LCSD and MS/MSD	Refer to Table 8-1 of FTMC "Installation Wide Sample and Analysis Plan"	Refer to Table 8-1 of FTMC "Installation Wide Sample and Analysis Plan"
Metals LCS/LCSD and MS/MSD	RPD < 20%	RPD < 20%

2.5 Analytical Accuracy Assessment

Accuracy is a measure of the degree of agreement of a result against an accepted reference or true value. Accuracy is expressed as a percent recovery (%R) calculated by the ratio of the measurement and accepted true value as shown in the following equation:

$$\%R = (|X_s - X_u|/K) \times 100$$

where:

- X_s = measured value of the spiked sample
- X_u = measured value of the unspiked sample
- K = known amount of the spike in the sample

Surrogate recoveries, MS/MSD and LCS/LCSD were used to measure analytical accuracy as described in SW846 8330, 6010B/7470A/7471A, 9060 and EPA 314.0. Reported results indicate that an acceptable level of analytical accuracy was achieved.

2.6 Data Representativeness

Representativeness is a qualitative parameter that expresses the degree to which sample data actually represent the matrix conditions. Standardized requirements and procedures for sample collection, handling and analyses were employed to maximize sample representativeness.

Sample locations selected for this investigation will confirm whether contaminant releases into the environment have occurred and if contaminated soil exists at this parcel.

2.7 Data Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. By employing well-recognized techniques and accepted standardized methods for sampling and analysis, data comparability was achieved during this sampling event.

2.8 Data Completeness

Completeness is calculated for the aggregation of data for each analyte measured during the investigation of Parcel HR-140Q, Artillery and Mortar Impact Areas South of Bains Gap Road. The formula for calculating completeness is listed below:

$$\% \text{ Completeness} = (X_V / X_T) \times 100$$

where:

X_V = number of valid (i.e., non-“R”-flagged) results

X_T = number of possible results

Parcel HR-140Q goal for completeness is 95% for both aqueous and soil samples. The % Completeness for this task is calculated to be 100%.

- $\% \text{ Completeness} = (267 / 267) \times 100 = 100\%$

2.9 Sensitivity

Sensitivity is defined as the ability of the laboratory's established method detection limits (MDL)/method reporting limits (MRL or RL) to meet project-specific DQOs or site-specific screening levels (SSSL) and or ecological screening values (ESV).

MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. MDLs are determined from an analysis of a sample in a given matrix containing the target analyte of interest. The MRL is a threshold value based upon the sensitivity capability of method and instrument. MRLs are normally set at a minimum of two times the MDL. MRLs are adjusted based on the sample matrix, moisture (solids only), and any necessary sample dilutions. The laboratory cannot reliably quantitate values reported above the MDL but below the MRL. Therefore, these analyte values must be flagged as estimated quantities (“J”-flagged).

To evaluate method sensitivity, a general comparison of the laboratory's MDLs/MRLs and the site investigation screening levels (background values, human health SSSL for residential reuse, and ESV) was performed and presented to the FTMC Base Realignment and Closure Team (BCT) (November 1999). The comparison summarized the relationship between the MDL/MRLs and SSSL/ESVs for each parameter typically reported for all of the major analytical methods used at FTMC. The few cases identified where the MDL and/or MRL values exceeded their corresponding human health SSSL and/or ESV were specifically highlighted and explained. It was understood that for these cases, the standard analytical method of analysis was not going to provide MDLs/MRLs, which met human health SSSLs or ESVs without significant uncertainty and

the possibility of reporting false negatives. It was generally accepted that standard EPA SW846 analytical methods would provide sufficient sensitivity for data reported and used in the site screening process at FTMC.

3.0 Data Usability

Data quality indicators (DQI) provide an internal guide for control and review to verify that data are scientifically sound, defensible, and of known and acceptable quality. Factors such as precision, accuracy, representativeness, comparability, completeness, and sensitivity were evaluated to determine if the project's DQOs were met. A review of the data revealed that the majority of QA/QC indicators were within acceptable control limits. Any data anomalies encountered during data validation and overall site evaluations have been summarized in the previous sections of this document.

Based on the results of data validation and QA review, IT has concluded that representative samples were collected and analyzed and the results are indicative of the media analyzed. The data are to be considered representative of site conditions and are usable for their intended purpose.

4.0 Attachments

Attachment A - Analytical Summary Table

Attachment B - Data Validation Summary Report

ATTACHMENT A
ANALYTICAL SUMMARY TABLE

Ft. McClellan
Parcel HR-140Q
Artillery and Mortar Impact Areas South of Bains Gap Road
Analytical Summary
Project No. 796887

HR-140Q Soil Sampling				
Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-140Q-GP01	HR-140Q-GP01-SS-YH0001-REG	YH0001	07-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-140Q-GP01-DS-YH0002-REG	YH0002	07-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-140Q-GP02	HR-140Q-GP02-SS-YH0003-REG	YH0003	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-140Q-GP02-DS-YH0004-REG	YH0004	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-140Q-GP02-DS-YH0005-FD	YH0005	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-140Q Sediment and Surface Water Sampling				
Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-140Q-SD/SW01	HR-140Q-SD/SW01-SD-YH1001-REG	YH1001	25-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330, Perchlorate by EPA 314.0 and Total Organic Carbon by SW9060.
	HR-140Q-SD/SW01-SW-YH2001-REG	YH2001	25-Apr-01	TAL Metals by SW6010B/SW7470, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.

ATTACHMENT B
DATA VALIDATION SUMMARY REPORT

**Data Validation Summary Report
For the Site Investigation Performed at the
“Artillery and Motor Impact Areas South of Bains Gap” (Parcel HR-140Q)
Fort McClellan, Calhoun County, Alabama**

1.0 Introduction

Level III data validation was performed on 100% of the environmental samples collected for CK10 (Parcel HR-140Q). The analytical data consisted of three sample delivery groups (SDG), 10140Q-01, 10140Q-02, and, 10140Q-03, which were analyzed by EMAX Laboratories. The chemical parameters for which the samples were analyzed and validated are identified below:

Parameter (Method)
TAL Metals by SW846 6010B/7470A/7471A
Nitroaromatic and Nitramine Explosives by SW846 8330
Perchlorate by EPA 314.0 and Total Organic Carbon (TOC) by SW846 9060

2.0 Procedures

The sample data were validated following the logic identified in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines For Inorganic Data Review (February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines For Organic Review (October 1999)* for all areas except Blanks. *Region III Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses (April 1993)* and *Region III National Functional Guidelines for Organic Data Review (June 1992)* were applied to the areas associated with blank contamination. Specific quality control (QC) criteria, as identified in the Quality Assurance Plan (QAP), analytical methods, and laboratory Standard Operating Procedures (SOP's) were applied to all sample results. As the result of the use of Update III SW846 test methods for the analytical data and the application of the CLP guidelines during the validation process, there were instances where specific QC requirements for all target compounds were not defined. This primarily occurred in the organic, Gas Chromatograph (GC) and Gas Chromatograph/Mass Spectra (GC/MS) calibration areas and is due to the fact that the analytical methods are performance-based, and allows the use of average calibration responses, in lieu of, individual responses, which are defined by CLP protocol. In light of applying CLP guidelines to SW846 methods and evaluating the usability of the data during the validation process, specific QC criteria were determined to address all target compounds and are identified in this report for each parameter, as well as, in the validation checklists, which

function as worksheets. All completed validation checklists are on file in the Knoxville office. For those analytical methods not addressed by the CLP and Region III guidelines, the validation was based on the method requirements (i. e. SW846, CFR, SOP's) and technical judgement, following the logic of the CLP validation guidelines.

3.0 Summary of Data Validation Findings

The overall quality of the data was determined to be acceptable with minimal qualifications. No data were rejected.

Individual validation reports have been prepared for each parameter and the overall results of the validation findings are summarized in this report. The validation qualifier data entry verification report (Attachment A) is also provided. This is a complete listing of all of the analytical results and the validation qualifiers assigned for HR-140Q. It also identifies the "use" column, which indicates which result to use in the event of a reanalysis. A listing of the validation qualifiers and the reason codes, along with their definitions are also found in Attachment A. The following section highlights the key findings of the data validation for each analysis.

4.0 Analysis-Specific Data Validation Summaries

4.1 Metals by SW-846 6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Preservation

All samples were properly preserved.

Initial and Continuing Calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were found to be acceptable with the exception of the following:

SDG Number	Sample Number	Compound	Blank Contaminant	Validation Qualifier
10140Q-01	YH0001	Cobalt	Calibration	B
	YH0003	Mercury	Calibration	B
10140Q-02	YH1001	Beryllium	Calibration	B
10140Q-03	YH2001	Nickel	Calibration	B

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample (LCS)

LCS was performed for the project samples and all QC criteria were met.

Interference Check Sample (ICS)

All ICS % recoveries were acceptable. All QC criteria were met.

ICP Serial Dilutions

All QC criteria were met for the serial dilutions associated with the project samples.

Field Duplicates

Original and field duplicate results were evaluated and all QC criteria were met.

Quantitation

Results quantitated between the IDL and the RL ("B" flagged by the laboratory) were qualified as estimated (J).

4.2 Nitroaromatic and Nitramine Explosives by SW846 8330

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges for the surrogates applied.

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

Original and field duplicate results were evaluated and no problems were identified.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as J, were qualified as estimated J unless blank contamination was present or the results were rejected.

4.3. Perchlorate by EPA 314.0 and Total Organic Carbon (TOC) by SW846 9060

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples. All was acceptable no qualification was necessary.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable, no qualification was necessary.

Matrix Spike / Matrix Spike Duplicate

MS/MSD were performed for the project samples, and all QC criteria were met. No qualification was necessary.

Laboratory Control Sample

Laboratory Control Sample (LCS) was performed for the project samples and all QC criteria were met. No qualification was necessary.

Field Duplicates

Original and field duplicate results were evaluated and no problems were noted.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as "J," were qualified as estimated 'J' unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

Validation Qualifiers

- U** Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.
- J** The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.
- B** The concentration reported was detected significantly above the levels reported in the associated equipment rinse samples and/or laboratory method and trip blanks. (5X/10X Rule was applied).
- R** The reported sample results are rejected due to the following:
1. Severe deficiencies in the supporting quality control data.
 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data.
 3. The presence or absence of the constituent cannot be verified based on the data provided.
 4. To indicate not to use a particular result in the event of a reanalysis.
- UJ** The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the “nondetect” may be inaccurate or imprecise. The nondetect result should be estimated.

Validation Reason Code Definitions

Reason Code	Description
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 1 of 7

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:	
															1	2	3	4			
10140Q-01																					
YH0001	SW6010B	SW3050	N	0	1	ALUMINUM	12500	mg/kg		Y	Y	P								B092-01	21:18
						ANTIMONY	13.1	mg/kg	U	N	Y	U	U							B092-01	21:18
						ARSENIC	2.24	mg/kg		Y	Y	P								B092-01	21:07
						BARIUM	95.7	mg/kg		Y	Y	P								B092-01	21:18
						BERYLLIUM	.548	mg/kg	J	Y	Y	P	J		15					B092-01	21:18
						CADMIUM	.653	mg/kg	U	N	Y	U	U							B092-01	21:18
						CALCIUM	336	mg/kg		Y	Y	P								B092-01	21:18
						CHROMIUM	10.9	mg/kg		Y	Y	P								B092-01	21:18
						COBALT	1.09	mg/kg	J	Y	Y	F	B		06B					B092-01	21:18
						COPPER	3.29	mg/kg		Y	Y	P								B092-01	21:18
						IRON	15000	mg/kg		Y	Y	P								B092-01	21:18
						LEAD	9.05	mg/kg		Y	Y	P								B092-01	21:07
						MAGNESIUM	557	mg/kg		Y	Y	P								B092-01	21:18
						MANGANESE	157	mg/kg		Y	Y	P								B092-01	21:18
						NICKEL	3.83	mg/kg		Y	Y	P								B092-01	21:18
						POTASSIUM	1250	mg/kg		Y	Y	P								B092-01	21:18
						SELENIUM	1.31	mg/kg	U	N	Y	U	U							B092-01	21:07
						SILVER	1.31	mg/kg	U	N	Y	U	U							B092-01	21:18
						SODIUM	131	mg/kg	U	N	Y	U	U							B092-01	21:18
						THALLIUM	2.61	mg/kg	U	N	Y	U	U							B092-01	21:07
						VANADIUM	14	mg/kg		Y	Y	P								B092-01	21:18
						ZINC	14.2	mg/kg		Y	Y	P								B092-01	21:18
	SW7471A	TOTAL	N	0	1	MERCURY	.131	mg/kg	U	N	Y	U	U							B092-01	12:21
YH0002	SW6010B	SW3050	N	0	1	ALUMINUM	13600	mg/kg		Y	Y	P								B092-02	21:23
						ANTIMONY	12.2	mg/kg	U	N	Y	U	U							B092-02	21:23
						ARSENIC	3.86	mg/kg		Y	Y	P								B092-02	21:03
						BARIUM	30.2	mg/kg		Y	Y	P								B092-02	21:23
						BERYLLIUM	.689	mg/kg	J	Y	Y	P	J		15					B092-02	21:23
						CADMIUM	.612	mg/kg	U	N	Y	U	U							B092-02	21:23
						CALCIUM	13.5	mg/kg	J	Y	Y	P	J		15					B092-02	21:23
						CHROMIUM	7.38	mg/kg		Y	Y	P								B092-02	21:23
						COBALT	2.45	mg/kg	U	N	Y	U	U							B092-02	21:23
						COPPER	6.79	mg/kg		Y	Y	P								B092-02	21:23
						IRON	12900	mg/kg		Y	Y	P								B092-02	21:23
						LEAD	9.58	mg/kg		Y	Y	P								B092-02	21:03
						MAGNESIUM	498	mg/kg		Y	Y	P								B092-02	21:23
						MANGANESE	8.1	mg/kg		Y	Y	P								B092-02	21:23
						NICKEL	3.56	mg/kg		Y	Y	P								B092-02	21:23
						POTASSIUM	2310	mg/kg		Y	Y	P								B092-02	21:23
						SELENIUM	1.22	mg/kg	U	N	Y	U	U							B092-02	21:03

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 2 of 7

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:						
													Qlfr	Code:	1	2	3	4								
10140Q-01																										
YH0002	SW6010B	SW3050	N	0	1	SILVER	1.22	mg/kg	U	N	Y	U	U							B092-02	21:23					
						SODIUM	122	mg/kg	U	N	Y	U	U										B092-02	21:23		
						THALLIUM	2.45	mg/kg	U	N	Y	U	U											B092-02	21:03	
						VANADIUM	9.18	mg/kg		Y	Y	P													B092-02	21:23
						ZINC	5.43	mg/kg		Y	Y	P													B092-02	21:23
							SW7471A	TOTAL	N	0	1	MERCURY	.122	mg/kg	U	N	Y	U	U							B092-02
YH0003	SW6010B	SW3050	N	0	1	ALUMINUM	21700	mg/kg		Y	Y	P								B092-03	21:36					
						ANTIMONY	13.6	mg/kg	U	N	Y	U	U										B092-03	21:36		
						ARSENIC	3.67	mg/kg		Y	Y	P												B092-03	21:21	
						BARIUM	228	mg/kg		Y	Y	P												B092-03	21:36	
						BERYLLIUM	2.4	mg/kg		Y	Y	P												B092-03	21:36	
						CADMIUM	.678	mg/kg	U	N	Y	U	U												B092-03	21:36
						CALCIUM	364	mg/kg		Y	Y	P													B092-03	21:36
						CHROMIUM	11.1	mg/kg		Y	Y	P													B092-03	21:36
						COBALT	36.8	mg/kg		Y	Y	P													B092-03	21:36
						COPPER	11.8	mg/kg		Y	Y	P													B092-03	21:36
						IRON	11500	mg/kg		Y	Y	P													B092-03	21:36
						LEAD	25.4	mg/kg		Y	Y	P													B092-03	21:21
						MAGNESIUM	1230	mg/kg		Y	Y	P													B092-03	21:36
						MANGANESE	2290	mg/kg		Y	Y	P													B092-03	21:36
						NICKEL	9.93	mg/kg		Y	Y	P													B092-03	21:36
						POTASSIUM	971	mg/kg		Y	Y	P													B092-03	21:36
						SELENIUM	1.36	mg/kg	U	N	Y	U	U												B092-03	21:21
						SILVER	1.36	mg/kg	U	N	Y	U	U												B092-03	21:36
						SODIUM	136	mg/kg	U	N	Y	U	U												B092-03	21:36
						THALLIUM	2.71	mg/kg	U	N	Y	U	U												B092-03	21:21
						VANADIUM	18.1	mg/kg		Y	Y	P													B092-03	21:36
ZINC	37.6	mg/kg		Y	Y	P													B092-03	21:36						
	SW7471A	TOTAL	N	0	1	MERCURY	.051	mg/kg	J	Y	Y	F	B			06B			B092-03	12:26						
YH0004	SW6010B	SW3050	N	0	1	ALUMINUM	18100	mg/kg		Y	Y	P								B092-04	21:41					
						ANTIMONY	11.9	mg/kg	U	N	Y	U	U										B092-04	21:41		
						ARSENIC	3.23	mg/kg		Y	Y	P												B092-04	23:15	
						BARIUM	127	mg/kg		Y	Y	P												B092-04	21:41	
						BERYLLIUM	.938	mg/kg	J	Y	Y	P	J						15					B092-04	21:41	
						CADMIUM	.597	mg/kg	U	N	Y	U	U											B092-04	21:41	
						CALCIUM	119	mg/kg	J	Y	Y	P	J						15					B092-04	21:41	
						CHROMIUM	12	mg/kg		Y	Y	P													B092-04	21:41
						COBALT	25.7	mg/kg		Y	Y	P													B092-04	21:41
						COPPER	9.82	mg/kg		Y	Y	P													B092-04	21:41
						IRON	13100	mg/kg		Y	Y	P													B092-04	21:41

Validation Qualifier Data Entry Verification

Run Date: March 25, 2002

Fort McClellan

Page: 3 of 7

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10140Q-01																					
YH0004	SW6010B	SW3050	N	0	1	LEAD	11.6	mg/kg		Y	Y	P								B092-04	23:15
						MAGNESIUM	1070	mg/kg		Y	Y	P								B092-04	21:41
						MANGANESE	778	mg/kg		Y	Y	P								B092-04	21:41
						NICKEL	8.42	mg/kg		Y	Y	P								B092-04	21:41
						POTASSIUM	1480	mg/kg		Y	Y	P								B092-04	21:41
						SELENIUM	1.19	mg/kg	U	N	Y	U	U							B092-04	23:15
						SILVER	1.19	mg/kg	U	N	Y	U	U							B092-04	21:41
						SODIUM	119	mg/kg	U	N	Y	U	U							B092-04	21:41
						THALLIUM	2.39	mg/kg	U	N	Y	U	U							B092-04	23:15
						VANADIUM	18.7	mg/kg		Y	Y	P								B092-04	21:41
						ZINC	25.6	mg/kg		Y	Y	P								B092-04	21:41
	SW7471A	TOTAL	N	0	1	MERCURY	.119	mg/kg	U	N	Y	U	U							B092-04	12:29
YH0005	SW6010B	SW3050	N	0	1	ALUMINUM	17100	mg/kg		Y	Y									B092-05	21:45
						ANTIMONY	11.8	mg/kg	U	N	Y		U							B092-05	21:45
						ARSENIC	3.13	mg/kg		Y	Y									B092-05	21:30
						BARIUM	118	mg/kg		Y	Y									B092-05	21:45
						BERYLLIUM	.825	mg/kg	J	Y	Y		J		15					B092-05	21:45
						CADMIUM	.588	mg/kg	U	N	Y		U							B092-05	21:45
						CALCIUM	114	mg/kg	J	Y	Y		J		15					B092-05	21:45
						CHROMIUM	12.4	mg/kg		Y	Y									B092-05	21:45
						COBALT	28.6	mg/kg		Y	Y									B092-05	21:45
						COPPER	9.65	mg/kg		Y	Y									B092-05	21:45
						IRON	12300	mg/kg		Y	Y									B092-05	21:45
						LEAD	13.1	mg/kg		Y	Y									B092-05	21:30
						MAGNESIUM	1020	mg/kg		Y	Y									B092-05	21:45
						MANGANESE	661	mg/kg		Y	Y									B092-05	21:45
						NICKEL	8.43	mg/kg		Y	Y									B092-05	21:45
						POTASSIUM	1540	mg/kg		Y	Y									B092-05	21:45
						SELENIUM	1.18	mg/kg	U	N	Y		U							B092-05	21:30
						SILVER	1.18	mg/kg	U	N	Y		U							B092-05	21:45
						SODIUM	118	mg/kg	U	N	Y		U							B092-05	21:45
						THALLIUM	2.35	mg/kg	U	N	Y		U							B092-05	21:30
						VANADIUM	17.6	mg/kg		Y	Y									B092-05	21:45
						ZINC	26.9	mg/kg		Y	Y									B092-05	21:45
	SW7471A	TOTAL	N	0	1	MERCURY	.118	mg/kg	U	N	Y		U							B092-05	12:31
YH0001	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B092-01	02:01
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B092-01	02:01
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B092-01	02:01
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B092-01	02:01
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B092-01	02:01

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 4 of 7

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10140Q-01																	
YH0001	SW8330	METHOD	N 0 1	2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-01	02:01
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-01	02:01
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-01	02:01
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-01	02:01
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-01	02:01
				HMX	.4	mg/kg	U	N	Y	U	U					B092-01	02:01
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B092-01	02:01
				RDX	.4	mg/kg	U	N	Y	U	U					B092-01	02:01
				TETRYL	.4	mg/kg	U	N	Y	U	U					B092-01	02:01
YH0002	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				HMX	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				RDX	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
				TETRYL	.4	mg/kg	U	N	Y	U	U					B092-02	02:42
YH0003	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				HMX	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				RDX	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
				TETRYL	.4	mg/kg	U	N	Y	U	U					B092-03	03:22
YH0004	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					B092-04	04:03

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 5 of 7

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Fit	REX	Dil:									1	2	3	4		
10140Q-01																	
YH0004	SW8330	METHOD	N 0 1	2,4-DNT	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				HMX	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				RDX	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
				TETRYL	.4	mg/kg	U	N	Y	U	U					B092-04	04:03
YH0005	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y		U					B092-05	05:24
				1,3-DNB	.4	mg/kg	U	N	Y		U					B092-05	05:24
				2,4,6-TNT	.4	mg/kg	U	N	Y		U					B092-05	05:24
				2,4-DNT	.4	mg/kg	U	N	Y		U					B092-05	05:24
				2,6-DNT	.4	mg/kg	U	N	Y		U					B092-05	05:24
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y		U					B092-05	05:24
				2-NITROTOLUENE	.4	mg/kg	U	N	Y		U					B092-05	05:24
				3-NITROTOLUENE	.4	mg/kg	U	N	Y		U					B092-05	05:24
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y		U					B092-05	05:24
				4-NITROTOLUENE	.4	mg/kg	U	N	Y		U					B092-05	05:24
				HMX	.4	mg/kg	U	N	Y		U					B092-05	05:24
				NITROBENZENE	.4	mg/kg	U	N	Y		U					B092-05	05:24
				RDX	.4	mg/kg	U	N	Y		U					B092-05	05:24
				TETRYL	.4	mg/kg	U	N	Y		U					B092-05	05:24
YH0001	EPA314.0	NONE	N 0 1	PERCHLORATE	.0653	mg/kg	U	N	Y	U	U					B092-01	18:18
YH0002	EPA314.0	NONE	N 0 1	PERCHLORATE	.0612	mg/kg	U	N	Y	U	U					B092-02	18:35
YH0003	EPA314.0	NONE	N 0 1	PERCHLORATE	.0678	mg/kg	U	N	Y	U	U					B092-03	18:52
YH0004	EPA314.0	NONE	N 0 1	PERCHLORATE	.0597	mg/kg	U	N	Y	U	U					B092-04	19:09
YH0005	EPA314.0	NONE	N 0 1	PERCHLORATE	.0588	mg/kg	U	N	Y		U					B092-05	19:27
10140Q-02																	
YH1001	SW6010B	SW3050	N 0 1	ALUMINUM	7180	mg/kg		Y	Y	P						D260-01	23:11
				ANTIMONY	12.9	mg/kg	U	N	Y	U	U					D260-01	23:11
				ARSENIC	5.61	mg/kg		Y	Y	P						D260-01	23:01
				BARIUM	94.3	mg/kg		Y	Y	P						D260-01	23:11
				BERYLLIUM	.779	mg/kg	J	Y	Y	F	B		06B			D260-01	23:11
				CADMIUM	.647	mg/kg	U	N	Y	U	U					D260-01	23:11
				CALCIUM	149	mg/kg		Y	Y	P						D260-01	23:11
				CHROMIUM	17.6	mg/kg		Y	Y	P						D260-01	23:11

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 6 of 7

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10140Q-02																	
YH1001	SW6010B	SW3050	N 0 1	COBALT	8.5	mg/kg		Y	Y	P						D260-01	23:11
				COPPER	5.83	mg/kg		Y	Y	P						D260-01	23:11
				IRON	33100	mg/kg		Y	Y	P						D260-01	23:11
				LEAD	9.19	mg/kg		Y	Y	P						D260-01	23:01
				MAGNESIUM	316	mg/kg		Y	Y	P						D260-01	23:11
				MANGANESE	330	mg/kg		Y	Y	P						D260-01	23:11
				NICKEL	5.13	mg/kg		Y	Y	P						D260-01	23:11
				POTASSIUM	2030	mg/kg		Y	Y	P						D260-01	23:11
				SELENIUM	1.29	mg/kg	U	N	Y	U	U					D260-01	23:01
				SILVER	1.29	mg/kg	U	N	Y	U	U					D260-01	23:11
				SODIUM	129	mg/kg	U	N	Y	U	U					D260-01	23:11
				THALLIUM	1.27	mg/kg	J	Y	Y	P	J		15			D260-01	23:01
				VANADIUM	17.4	mg/kg		Y	Y	P						D260-01	23:11
				ZINC	11	mg/kg		Y	Y	P						D260-01	23:11
	SW7471A	TOTAL	N 0 1	MERCURY	.129	mg/kg	U	N	Y	U	U					D260-01	15:18
YH1001	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				HMX	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				RDX	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
				TETRYL	.4	mg/kg	U	N	Y	U	U					D260-01	20:36
YH1001	E314.0	NONE	N 0 1	PERCHLORATE	.0647	mg/kg	U	N	Y	U	U					D260-01	21:20
YH1001	SW9060	NONE	N 0 1	TOC	26.3	mg/kg		Y	Y	P						D260-01	11:10
10140Q-03																	
YH2001	SW6010B	SW3010	N 0 1	ALUMINUM	.119	mg/L	J	Y	Y	P	J		15			D261-01	21:00
				ANTIMONY	.1	mg/L	U	N	Y	U	U					D261-01	21:00
				ARSENIC	.01	mg/L	U	N	Y	U	U					D261-01	19:51
				BARIUM	.0283	mg/L		Y	Y	P						D261-01	21:00
				BERYLLIUM	.001	mg/L	U	N	Y	U	U					D261-01	21:00
				CADMIUM	.01	mg/L	U	N	Y	U	U					D261-01	21:00
				CALCIUM	.328	mg/L	J	Y	Y	P	J		15			D261-01	21:00

Validation Qualifier Data Entry Verification

Fort McClellan

Run Date: March 25, 2002

Page: 7 of 7

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10140Q-03																					
YH2001	SW6010B	SW3010	N	0	1	CHROMIUM	.01	mg/L	U	N	Y	U	U							D261-01	21:00
						COBALT	.02	mg/L	U	N	Y	U	U							D261-01	21:00
						COPPER	.02	mg/L	U	N	Y	U	U							D261-01	21:00
						IRON	.057	mg/L	J	Y	Y	P	J		15					D261-01	21:00
						LEAD	.01	mg/L	U	N	Y	U	U							D261-01	19:51
						MAGNESIUM	.373	mg/L	J	Y	Y	P	J		15					D261-01	21:00
						MANGANESE	.00608	mg/L	J	Y	Y	P	J		15					D261-01	21:00
						NICKEL	.0109	mg/L	J	Y	Y	F	B		06B					D261-01	21:00
						POTASSIUM	2.75	mg/L	J	Y	Y	P	J		15					D261-01	21:00
						SELENIUM	.01	mg/L	U	N	Y	U	U							D261-01	19:51
						SILVER	.01	mg/L	U	N	Y	U	U							D261-01	21:00
						SODIUM	.902	mg/L	J	Y	Y	P	J		15					D261-01	21:00
						THALLIUM	.01	mg/L	U	N	Y	U	U							D261-01	19:51
						VANADIUM	.01	mg/L	U	N	Y	U	U							D261-01	21:00
						ZINC	.02	mg/L	U	N	Y	U	U							D261-01	21:00
	SW7470A	TOTAL	N	0	1	MERCURY	.0005	mg/L	U	N	Y	U	U							D261-01	11:26
YH2001	SW8330	METHOD	N	0	1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						1,3-DNB	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						2,4,6-TNT	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						2,4-DNT	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						2,6-DNT	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						HMX	.001	mg/L	U	N	Y	U	U							D261-01	03:46
						NITROBENZENE	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						RDX	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
						TETRYL	.0004	mg/L	U	N	Y	U	U							D261-01	03:46
YH2001	E314.0	NONE	N	0	1	PERCHLORATE	.005	mg/L	U	N	Y	U	U							D261-01	17:20

**Quality Assurance Report
For the Artillery and Mortar Impact Areas
South of Bains Gap Road
Parcel HR-141Q
IT Project No 796887
Fort McClellan Quality Assurance Report**

1.0 Overview

Ten soil samples, 1 sediment samples and 1 surface water sample were collected in support of the investigation at Fort McClellan (FTMC) Parcel HR-141Q, Artillery and Mortar Impact Areas South of Bains Gap Road. All samples were submitted to EMAX Laboratories, Inc. for analysis. Soil, sediment, and surface water samples were analyzed for target analyte list (TAL) metals, nitroaromatic-nitramine explosives, and perchlorate. QC samples consisted of the following types and quantities: 4 equipment rinsates. An analytical summary table cross-referencing sample location, sample number, and contaminants of concern is presented in Attachment A.

One hundred (100) percent of samples were validated and reviewed in accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Evaluating Inorganic Data Review (EPA, February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines for Organic Review (EPA, October 1999)* for all areas except blanks. *Region III Laboratory Data Validation Functional Guidelines for Inorganic Analyses (EPA, April 1993)* and *Region III National Functional Guidelines for Organic Data Review (EPA, June 1992)* were applied to the areas associated with blank contamination. Data qualifiers assigned to results were based on guidance outlined in the referenced documents and the *Installation-Wide Sampling and Analysis Plan (IT, March 2000)* for FTMC. Table 1.0-1 and Table 1.0-2 define laboratory data and validation data qualifiers assigned to analytical results, respectively.

**Table 1.0-1
Laboratory Data Qualifier Definitions**

Data Qualifier	Laboratory Data Qualifier Definition
B	Analyte detected in method blank at concentration greater than the reporting limit (and greater than zero).
C	Confirming data obtained using second GC column or GC/MS.
E	Analyte concentration exceeded calibration range.
I	Analyte identification suspect. See narrative for explanation.
J	Result is less than or equal to specified reporting limit but greater than the method detection limit (MDL).
P	Analyte not confirmed. Results from primary and secondary GC columns differ by greater than 10 percent
S	Analyte concentration obtained using Method of Standard Additions (MSA).
U	Not detected. The value represented indicates the reporting limit for the analysis.
D	Sample analyzed as a dilution. The result reported has been calculated using the appropriate dilution factor.
No Code	Confirmed identification.

**Table 1.0-2
Validation Data Qualifier Definitions**

Validation Qualifier	Validation Data Qualifier Definition
U	Not detected. The associated number indicates approximate sample concentration necessary to be detected.
No Code	Confirmed identification
B	Not detected substantially above the level reported in laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
N	Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise. Considered an estimate.
NJ	Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

The Data Validation Summary Report is presented in Attachment B.

2.0 Summary

Data were evaluated to verify compliance with precision, accuracy, representativeness, comparability, completeness, and sensitivity. To verify that project data quality objectives (DQO) were met, laboratory analytical results and data packages were examined for compliance with SW846 SW6010B/SW7000 Series, SW8330, 9060 and U.S. Environmental Protection Agency (EPA) 314.0 quality control (QC) method criteria. Laboratory nonconformances and discrepancies in the data were also examined to determine their impact on the data. The results of this review are presented in the following sections.

2.1 Sample Receipt and Analytical Holding Times

All sample results generated by the laboratory during this investigation have been reviewed with respect to condition of samples as received by the laboratory, chain-of-custody, and analysis holding times. All coolers were received by EMAX in good condition under proper chain-of-custody.

All extraction and analytical holding times were met.

2.2 Rejected Data

No data were qualified by the laboratory or after validation was completed as being rejected ("R"-flagged).

2.3 Blank Results

A description of the types of blank samples which were collected, processed, and evaluated for background and/or process contamination during this sampling is as follows:

- Equipment rinsates (ER) are samples of analyte-free deionized water poured into, or over, or pumped through the sampling device, collected in a sample container, and transported to the laboratory for analysis. Equipment rinsates are used to assess the effectiveness of equipment decontamination procedures.
- Method blanks (MB) are used in the laboratory to assess and document any possible contamination resulting from the analytical process. A method blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank shall be carried through the complete sample preparation and analytical procedure.
- Initial and continuing calibration blanks (ICB and CCB) are an analyte-free matrix which is analyzed to verify the analysis system is free of contamination. ICBs and CCBs are analyzed immediately after the initial and continuing calibration is performed.

Field sample concentrations were evaluated to determine if the sample results could have been biased by the presence of any contamination measured in equipment rinsate blanks, method blanks and/or initial/continuing calibration blanks. Sample data affected by blank contamination are summarized in Table 2.3-1.

**Table 2.3-1
Summary of Blank Contamination**

Sample Delivery Group	Sample Number	Contaminant	Action
10141-01	YJ0002	Cobalt	Cobalt result for sample YJ0002 was "B" qualified.
10141Q-01	YJ0007 & YJ0008	Nickel	Nickel results for samples YJ0007 and YJ0008 were "B" qualified.
10141Q-02	YJ0004	Cobalt	Cobalt result for sample YJ0004 was "B" qualified.
10141Q-03	YJ0009	Cobalt	Cobalt result for sample YJ0009 was "B" qualified.
10141Q-05	YJ2002	Calcium	Calcium result for sample YJ2002 was "B" qualified.

2.4 Analytical Precision

Precision is defined as a measurement of mutual agreement among individual measurements of the same property, usually under "prescribed similar conditions." Analytical precision is calculated as relative percent difference (%RPD) based on the following formula:

$$\%RPD = \frac{|(A-B)|}{(A+B)/2} \times 100$$

where:

- %RPD = Relative Percent Difference
- A = original result
- B = duplicate result

A high RPD between an original sample and its field duplicate may be attributable to the difference in sample matrix or distribution of the contaminant within the sample, rather than the precision of the collection process. Also, when "estimated" results are reported, there is a potential for increased variability between the primary and duplicate sample results. This occurs because, at low concentrations, the relative difference in results is magnified by the RPD calculation even though the results are comparable in absolute terms. There is also increased uncertainty in the results as the lower limit of detection is approached, due to decreasing analytical accuracy. The RPD calculation cannot be performed in cases where non-detected results are reported with corresponding samples that contain detectable concentrations.

Overall sampling and analysis precision for this task was assessed using field duplicate (FD) samples. Laboratory precision was assessed by laboratory control sample/laboratory control sample duplicate (LCS/LCSD) and matrix spike/matrix spike duplicate (MS/MSD) recoveries.

Results indicate that an acceptable analytical precision was achieved. Table 2.4-1 lists precision acceptance criteria for LCS/LCSD, MS/MSD organic and inorganic analyses and field duplicate comparisons. RPD anomalies are summarized in Table 2.4-2.

**Table 2.4-1
Precision Acceptance Criteria**

Field/Laboratory QC Type	Matrix	
	Aqueous	Soil
Field Duplicate (Both Organic & Inorganic)	RPD < 35%	RPD < 50%
Perchlorate LCS/LCSD and MS/MSD	RPD < 10%	RPD < 20%
Nitroaromatic and Nitramine Explosives LCS/LCSD and MS/MSD	Refer to Table 8-1 of FTMC "Installation Wide Sample and Analysis Plan"	Refer to Table 8-1 of FTMC "Installation Wide Sample and Analysis Plan"
Metals LCS/LCSD and MS/MSD	RPD < 20%	RPD < 20%

**Table 2.4-2
Summary of Field Duplicate, LCS/LCSD & MS/MSD RPD Anomalies**

Sample Delivery Group	Sample Number	Contaminant (RPD %)	Assigned Validation Qualifier
10141Q-04	IPE026SL/IPE026SC (LCS/LCSD)	Zinc (23%)	Zinc results for sample YJ0010 and YJ1002 were "J" qualified due to failing LCS/LCSD RPD.
10141Q-05	EXE003WL / EXE003WY (LCS/LCSD)	HMX (38%) 1,3,5-TNB (44%) 1,3-DNB (36%) Tetryl (50%) 2,4,6-TNT (38%)	HMX, 1,3,5-TNB, 1,3-DNB, Tetryl and 2,4,6-TNT results for sample YJ2002 were "UJ" qualified due to failing LCS/LCSD RPD.

2.5 Analytical Accuracy Assessment

Accuracy is a measure of the degree of agreement of a result against an accepted reference or true value. Accuracy is expressed as a percent recovery (%R) calculated by the ratio of the measurement and accepted true value as shown in the following equation:

$$\%R = (|X_s - X_u|/K) \times 100$$

where:

X_s = measured value of the spiked sample

X_u = measured value of the unspiked sample

K = known amount of the spike in the sample

Surrogate recoveries, MS/MSD and LCS/LCSD, were used to measure analytical accuracy as described in SW846 8330, SW6010B/SW7000, 9060 and 314.0. Reported results indicate that an acceptable level of analytical accuracy was achieved. LCS/LCSD and MS/MSD spike recoveries which exceed QA criteria are summarized in Table 2.5-1.

**Table 2.5-1
Summary of LCS/LCSD and MS/MSD Spike Recovery Criteria Exceedances**

Sample Delivery Group	Sample Number	Contaminant	Action
10141Q-01	YJ0005 MS/MSD	Antimony (LB) Barium (LB)	Antimony and barium results for sample YJ0005, YJ0006, YJ0007 and YJ0008 were "J" / "UJ" qualified due to failing MS/MSD spike recoveries.
10141Q-04	IPE026SL/IPE026SC (LCS/LCSD)	Zinc (HB)	Zinc results for sample YJ0010 and YJ1002 were "J" qualified due to failing LCS/LCSD spike recoveries.

LB - low bias.

HB - high bias.

2.6 Data Representativeness

Representativeness is a qualitative parameter that expresses the degree to which sample data actually represent the matrix conditions. Sample locations selected for this investigation outline contaminant releases into the environment, that may have occurred and will confirm whether contaminated soil exists at this site. Soil sample data are being used to assess potential impacts to terrestrial biota that might use the site for food and/or habitat purposes.

Standardized requirements and procedures for sample collection and handling were employed to maximize sample representativeness.

2.7 Data Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. By employing well-recognized techniques and accepted standardized methods for sampling and analysis, data comparability was achieved during this sampling event.

2.8 Data Completeness

Completeness is calculated for the aggregation of data for each analyte measured during the investigation of Parcel HR-141Q Artillery and Mortar Impact Areas South of Bains Gap Road. The formula for calculating completeness is listed below:

$$\% \text{ Completeness} = (X_V / X_T) \times 100$$

where:

X_V = number of valid (i.e., non-"R"-flagged) results
 X_T = number of possible results

Parcel HR-141Q goal for completeness is 95% for both aqueous and soil samples. The % Completeness for this task is calculated to be 100%.

- $\% \text{ Completeness} = (457 / 457) \times 100 = 100\%$

2.9 Sensitivity

Sensitivity is defined as the ability of the laboratory's established method detection limits (MDL)/method reporting limits (MRL or RL) to meet project-specific DQOs or site-specific screening levels (SSSL) and or ecological screening values (ESV).

MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. MDLs are determined from an analysis of a sample in a given matrix containing the target analyte of interest. The MRL is a threshold value based upon the sensitivity capability of method and instrument. MRLs are normally set at a minimum of two times the MDL. MRLs are adjusted based on the sample matrix, moisture (solids only), and any necessary sample dilutions. The laboratory cannot reliably quantitate values reported above the MDL but below the MRL. Therefore, these analyte values must be flagged as estimated quantities ("J"-flagged).

To evaluate method sensitivity, a general comparison of the laboratory's MDLs/MRLs and the site investigation screening levels (background values, human health SSSL for residential reuse, and [ESV]) was performed and presented to the FTMC Base Realignment and Closure Team (BCT) (November 1999). The comparison summarized the relationship between the MDL/MRLs and SSSL/ESVs for each parameter typically reported for all of the major analytical methods used at FTMC. The few cases identified where the MDL and/or MRL values exceeded their corresponding human health SSSL and/or ESV were specifically highlighted and explained. It was understood that for these cases, the standard analytical method of analysis was not going to provide MDLs/MRLs which met human health SSSLs or ESVs without significant uncertainty and the possibility of reporting false negatives. It was generally accepted that standard EPA SW846 analytical methods would provide sufficient sensitivity for data reported and used in the site screening process at FTMC.

3.0 Data Usability

Data quality indicators (DQI) provide an internal guide for control and review to verify that data are scientifically sound, defensible, and of known and acceptable quality. Factors such as precision, accuracy, representativeness, comparability, completeness, and sensitivity were evaluated to determine if the project's DQOs were met. A review of the data revealed that the majority of QA/QC indicators were within acceptable control limits. Any data anomalies encountered during data validation and overall site evaluations have been summarized in the previous sections of this document.

Based on the results of data validation and QA review, IT has concluded that representative samples were collected and analyzed and that the results are indicative of the media analyzed. The data are to be considered representative of site conditions and are usable for their intended purpose.

4.0 Attachments

Attachment A - Analytical Summary Table

Attachment B - Data Validation Summary Report

ATTACHMENT A
ANALYTICAL SUMMARY TABLE

Ft. McClellan
Parcel HR-141Q
Artillery and Mortar Impact Areas South of Bains Gap Road
Analytical Summary
Project No. 796887

HR-141Q Soil Sampling

Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-141Q-GP01	HR-141Q-GP01-SS-YJ0001-REG	YJ0001	07-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-141Q-GP01-DS-YJ0002-REG	YJ0002	07-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-141Q-GP02	HR-141Q-GP02-SS-YJ0003-REG	YJ0003	11-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-141Q-GP02-DS-YJ0004-REG	YJ0004	11-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-141Q-GP03	HR-141Q-GP03-SS-YJ0005-REG	YJ0005	09-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-141Q-GP03-DS-YJ0006-REG	YJ0006	09-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-141Q-GP04	HR-141Q-GP04-SS-YJ0007-REG	YJ0007	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-141Q-GP04-DS-YJ0008-REG	YJ0008	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-141Q-DEP01	HR-141Q-DEP01-SS-YJ0009-REG	YJ0009	24-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-141Q-DEP02	HR-141Q-DEP02-SS-YJ0010-REG	YJ0010	03-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.

HR-141Q Sediment-Surface Water Sampling

Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-141Q-SW/SD02	HR-141Q-SW/SD02-SD-YJ1002-REG	YJ1002	03-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330, Perchlorate by EPA 314.0, TOC by SW9060 and Grain size by ASTM 421/422.
	HR-141Q-SW/SD02-SW-YJ2002-REG	YJ2002	03-May-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.

ATTACHMENT B
DATA VALIDATION SUMMARY REPORT

**Data Validation Summary Report
For the Site Investigation Performed at the
“Artillery and Mortar Impact Areas South of Bains Gap”
Parcel HR-141Q
Fort McClellan, Calhoun County, Alabama**

1.0 Introduction

Level III data validation was performed on 100% of the environmental samples collected for HR-141Q. The analytical data consisted of six sample delivery groups (SDG), 10141-01, 10141Q-01, 10141Q-02, 10141Q-03, 10141Q-04, and 10141Q-05, which were analyzed by EMAX Laboratories. The chemical parameters for which the samples were analyzed, are identified below:

Parameter (Method)
Perchlorate by EPA 314.0 and TOC by SW846 9060
Nitroaromatic and Nitramine Explosives by SW846 8330
Metals by SW846 6010B and 7471A/7470A

2.0 Procedures

The sample data were validated following the logic identified in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines For Inorganic Data Review (February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines For Organic Review (October 1999)* for all areas except Blanks. *Region III Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses (April 1993)* and *Region III National Functional Guidelines for Organic Data Review (June 1992)* were applied to the areas associated with blank contamination. Specific quality control (QC) criteria, as identified in the Quality Assurance Plan (QAP), analytical methods, and laboratory Standard Operating Procedures (SOP's) were applied to all sample results. As the result of the use of Update III SW846 test methods for the analytical data and the application of the CLP guidelines during the validation process, there were instances where specific QC requirements for all target compounds were not defined. This primarily occurred in the organic, Gas Chromatograph (GC) and Gas Chromatograph/Mass Spectra (GC/MS) calibration areas and is due to the fact that the analytical methods are performance-based, and allows the use of average calibration responses, in lieu of, individual responses, which are defined by CLP protocol. In light of applying CLP guidelines to SW846 methods and evaluating the usability of the data during the validation process, specific QC criteria were determined to address all target compounds and are identified in this report for each parameter, as well as, in the validation checklists, which

function as worksheets. All completed validation checklists are on file in the Knoxville office. For those analytical methods not addressed by the CLP and Region III guidelines, the validation was based on the method requirements (i. e. SW846, CFR, SOP's) and technical judgement, following the logic of the CLP validation guidelines.

3.0 Summary of Data Validation Findings

The overall quality of the data was determined to be acceptable with minimal qualifications. No data were rejected.

Individual validation reports have been prepared for each parameter and the overall results of the validation findings are summarized in this report. The validation qualifier data entry verification report (Attachment A) is also provided. This is a complete listing of all of the analytical results and the validation qualifiers assigned for HR-141Q. It also identifies the "use" column, which indicates which result to use in the event of a reanalysis. A listing of the validation qualifiers and the reason codes, along with their definitions are also found in Attachment A. The following section highlights the key findings of the data validation for each analysis.

4.0 Analysis-Specific Data Validation Summaries

4.1 Perchlorate by EPA 314.0 and TOC by SW846 9060

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

No field duplicates were associated with these SDGs.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J' were qualified as estimated "J", unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.2 Nitroaromatic and Nitramine Explosives by SW846 8330

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all project samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges.

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met.

Laboratory Control Sample

LCS was performed for the project samples and all QC criteria were found to be acceptable, with the exception of the following:

SDG Number	Sample	Compound	Validation Qualifier
10141Q-05	YJ2002	1,3,5-Trinitrobenzene, 1,3-Dinitrobenzene, 2,4,6-Trinitrotoluene, HMX, Tetryl	UJ

Field Duplicates

No field duplicates were associated with these SDGs.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J' were qualified as estimated "J" unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

4.3 Metals by SW846 6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were found to be acceptable, with the exception of the following:

SDG Number	Sample Number	Compound	Blank Contaminant	Validation Qualifier
10141-01	YJ0002	Cobalt	ICB/CCB	B
10141Q-01	YJ0007, YJ0008	Nickel	ICB/CCB	B
10141Q-02	YJ0004	Cobalt	ICB/CCB	B
10141Q-03	YJ0009	Cobalt	ICB/CCB	B
10141Q-05	YJ2002	Calcium	ICB/CCB	B

Matrix Spike / Matrix Spike Duplicate

MS/MSD analysis was performed for the project samples and all QC criteria were met with the following exceptions:

SDG Number	Sample Number	Compound	Validation Qualifier
10141Q-01	ALL	Antimony, Barium	J/UJ

Laboratory Control Sample (LCS)

LCS was performed for the project samples and all QC criteria were met with the following exceptions:

SDG Number	Sample	Compound	Validation Qualifier
10141Q-04	YJ0010, YJ1002	Zinc	J

Interference Check Sample (ICS)

All ICS % recoveries were acceptable. All QC criteria were met.

ICP Serial Dilutions

All QC criteria were met for the serial dilutions associated with the project samples with the following exceptions:

SDG Number	Sample	Compound	Validation Qualifier
10141Q-01	All	Chromium, Cobalt, Nickel, Zinc	J/B
10141Q-04	YJ0010, YJ1002	Zinc	J

Field Duplicates

No field duplicates were associated with these SDGs.

Sample Quantitation

Results quantitated between the IDL and the RL ("B" flagged by the laboratory) were qualified as estimated (J), unless blank contamination was present or the results were rejected. Results rejected in favor of a preferred result (e.g., due to dilution or reanalysis) were qualified as rejected 'R'.

ATTACHMENT A:

Data Validation Qualifier Entry Verification Report

Validation Qualifiers

- U Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.
- J The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.
- B The concentration reported was detected significantly above the levels reported in the associated equipment rinse samples and/or laboratory method and trip blanks. (5X/10X Rule was applied).
- R The reported sample results are rejected due to the following:
1. Severe deficiencies in the supporting quality control data.
 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data.
 3. The presence or absence of the constituent cannot be verified based on the data provided.
 4. To indicate not to use a particular result in the event of a reanalysis.
- UJ The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the “nondetect” may be inaccurate or imprecise. The nondetect result should be estimated.

Validation Reason Code Definitions

Reason Code	Description
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 1 of 12

Sample Number:	Analytical/Extraction Method:		Flt REX Dil:	Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:
										Qlfr	Code:	1	2	3	4		
10141-01																	
YJ0001	SW6010B	SW3050	N 0 1	ALUMINUM	14900	mg/kg		Y	Y	P						B094-01	21:09
				ANTIMONY	12.5	mg/kg	U	N	Y	U	U					B094-01	21:09
				ARSENIC	3.14	mg/kg		Y	Y	P						B094-01	20:54
				BARIUM	63.3	mg/kg		Y	Y	P						B094-01	21:09
				BERYLLIUM	.91	mg/kg	J	Y	Y	P	J	15				B094-01	21:09
				CADMIUM	.624	mg/kg	U	N	Y	U	U					B094-01	21:09
				CALCIUM	66.8	mg/kg	J	Y	Y	P	J	15				B094-01	21:09
				CHROMIUM	11.1	mg/kg		Y	Y	P						B094-01	21:09
				COBALT	2.04	mg/kg	J	Y	Y	P	J	15				B094-01	21:09
				COPPER	3.68	mg/kg		Y	Y	P						B094-01	21:09
				IRON	14900	mg/kg		Y	Y	P						B094-01	21:09
				LEAD	11.6	mg/kg		Y	Y	P						B094-01	20:54
				MAGNESIUM	664	mg/kg		Y	Y	P						B094-01	21:09
				MANGANESE	23.7	mg/kg		Y	Y	P						B094-01	21:09
				NICKEL	4.49	mg/kg		Y	Y	P						B094-01	21:09
				POTASSIUM	577	mg/kg	J	Y	Y	P	J	15				B094-01	21:09
				SELENIUM	1.25	mg/kg	U	N	Y	U	U					B094-01	20:54
				SILVER	1.25	mg/kg	U	N	Y	U	U					B094-01	21:09
				SODIUM	125	mg/kg	U	N	Y	U	U					B094-01	21:09
				THALLIUM	2.5	mg/kg	U	N	Y	U	U					B094-01	20:54
				VANADIUM	19.4	mg/kg		Y	Y	P						B094-01	21:09
				ZINC	20.9	mg/kg		Y	Y	P						B094-01	21:09
	SW7471A	TOTAL	N 0 1	MERCURY	.043	mg/kg	J	Y	Y	P	J	15				B094-01	16:45
YJ0002	SW6010B	SW3050	N 0 1	ALUMINUM	15100	mg/kg		Y	Y	P						B094-02	21:13
				ANTIMONY	11.5	mg/kg	U	N	Y	U	U					B094-02	21:13
				ARSENIC	5.5	mg/kg		Y	Y	P						B094-02	20:58
				BARIUM	27.3	mg/kg		Y	Y	P						B094-02	21:13
				BERYLLIUM	1.08	mg/kg	J	Y	Y	P	J	15				B094-02	21:13
				CADMIUM	.574	mg/kg	U	N	Y	U	U					B094-02	21:13
				CALCIUM	16.1	mg/kg	J	Y	Y	P	J	15				B094-02	21:13
				CHROMIUM	11.7	mg/kg		Y	Y	P						B094-02	21:13
				COBALT	.816	mg/kg	J	Y	Y	F	B	06B 15				B094-02	21:13
				COPPER	5.09	mg/kg		Y	Y	P						B094-02	21:13
				IRON	13700	mg/kg		Y	Y	P						B094-02	21:13
				LEAD	5.02	mg/kg		Y	Y	P						B094-02	20:58
				MAGNESIUM	433	mg/kg		Y	Y	P						B094-02	21:13
				MANGANESE	2.98	mg/kg		Y	Y	P						B094-02	21:13
				NICKEL	4.12	mg/kg		Y	Y	P						B094-02	21:13
				POTASSIUM	2750	mg/kg		Y	Y	P						B094-02	21:13
				SELENIUM	1.15	mg/kg	U	N	Y	U	U					B094-02	20:58

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 2 of 12

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10141-01																					
YJ0002	SW6010B	SW3050	N	0	1	SILVER	1.15	mg/kg	U	N	Y	U	U							B094-02	21:13
						SODIUM	115	mg/kg	U	N	Y	U	U							B094-02	21:13
						THALLIUM	2.3	mg/kg	U	N	Y	U	U							B094-02	20:58
						VANADIUM	16.3	mg/kg		Y	Y	P								B094-02	21:13
						ZINC	11.1	mg/kg		Y	Y	P								B094-02	21:13
	SW7471A	TOTAL	N	0	1	MERCURY	.115	mg/kg	U	N	Y	U	U							B094-02	16:48
YJ0001	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						HMX	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						RDX	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
						TETRYL	.4	mg/kg	U	N	Y	U	U							B094-01	06:04
YJ0002	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						HMX	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						RDX	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
						TETRYL	.4	mg/kg	U	N	Y	U	U							B094-02	06:45
YJ0001	EPA314.0	NONE	N	0	1	PERCHLORATE	.0624	mg/kg	U	N	Y	U	U							B094-01	22:18
YJ0002	EPA314.0	NONE	N	0	1	PERCHLORATE	.0574	mg/kg	U	N	Y	U	U							B094-02	22:36
10141Q-01																					
YJ0005	SW6010B	SW3050	N	0	1	ALUMINUM	15700	mg/kg		Y	Y	P								B101-01	00:38
						ANTIMONY	13	mg/kg	U	N	Y	U	UJ		08A					B101-01	00:38

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 3 of 12

Sample Number:	Analytical/Extraction Method:		Fit	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10141Q-01																					
YJ0005	SW6010B	SW3050	N	0	1	ARSENIC	4.58	mg/kg		Y	Y	P								B101-01	21:58
						BARIUM	488	mg/kg		Y	Y	P	J		08A					B101-01	00:38
						BERYLLIUM	3.1	mg/kg		Y	Y	P								B101-01	00:38
						CADMIUM	.649	mg/kg	U	N	Y	U	U							B101-01	00:38
						CALCIUM	1670	mg/kg		Y	Y	P								B101-01	00:38
						CHROMIUM	7.98	mg/kg		Y	Y	P	J		13					B101-01	00:38
						COBALT	11.8	mg/kg		Y	Y	P	J		13					B101-01	00:38
						COPPER	11.9	mg/kg		Y	Y	P								B101-01	00:38
						IRON	14400	mg/kg		Y	Y	P								B101-01	00:38
						LEAD	36.7	mg/kg		Y	Y	P								B101-01	21:58
						MAGNESIUM	580	mg/kg		Y	Y	P								B101-01	00:38
						MANGANESE	2090	mg/kg		Y	Y	P								B101-01	00:38
						NICKEL	6.85	mg/kg		Y	Y	P	J		13					B101-01	00:38
						POTASSIUM	726	mg/kg		Y	Y	P								B101-01	00:38
						SELENIUM	1.3	mg/kg	U	N	Y	U	U							B101-01	21:58
						SILVER	1.3	mg/kg	U	N	Y	U	U							B101-01	00:38
						SODIUM	26.2	mg/kg	J	Y	Y	P	J		15					B101-01	00:38
						THALLIUM	2.59	mg/kg	U	N	Y	U	U							B101-01	21:58
						VANADIUM	13.2	mg/kg		Y	Y	P								B101-01	00:38
						ZINC	59.4	mg/kg		Y	Y	P	J		13					B101-01	00:38
	SW7471A	TOTAL	N	0	1	MERCURY	.065	mg/kg	J	Y	Y	P	J		15					B101-01	11:11
YJ0006	SW6010B	SW3050	N	0	1	ALUMINUM	11900	mg/kg		Y	Y	P								B101-02	00:42
						ANTIMONY	11.5	mg/kg	U	N	Y	U	UJ		08A					B101-02	00:42
						ARSENIC	4.7	mg/kg		N	Y	P								B101-02	22:02
						BARIUM	105	mg/kg		Y	Y	P	J		08A					B101-02	00:42
						BERYLLIUM	.933	mg/kg	J	Y	Y	P	J		15					B101-02	00:42
						CADMIUM	.576	mg/kg	U	N	Y	U	U							B101-02	00:42
						CALCIUM	124	mg/kg		Y	Y	P								B101-02	00:42
						CHROMIUM	21.5	mg/kg		Y	Y	P	J		13					B101-02	00:42
						COBALT	6.64	mg/kg		Y	Y	P	J		13					B101-02	00:42
						COPPER	12	mg/kg		Y	Y	P								B101-02	00:42
						IRON	35400	mg/kg		Y	Y	P								B101-02	00:42
						LEAD	9.07	mg/kg		Y	Y	P								B101-02	22:02
						MAGNESIUM	442	mg/kg		Y	Y	P								B101-02	00:42
						MANGANESE	302	mg/kg		Y	Y	P								B101-02	00:42
						NICKEL	6	mg/kg		Y	Y	P	J		13					B101-02	00:42
						POTASSIUM	820	mg/kg		Y	Y	P								B101-02	00:42
						SELENIUM	1.15	mg/kg	U	N	Y	U	U							B101-02	22:02
						SILVER	1.15	mg/kg	U	N	Y	U	U							B101-02	00:42
						SODIUM	115	mg/kg	U	N	Y	U	U							B101-02	00:42

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 4 of 12

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:			
													Qlfr	Code:	1	2	3	4					
10141Q-01																							
YJ0006	SW6010B	SW3050	N	0	1	THALLIUM	2.3	mg/kg	U	N	Y	U	U						B101-02	22:02			
						VANADIUM	18.3	mg/kg		Y	Y	P									B101-02	00:42	
						ZINC	17.7	mg/kg		Y	Y	P	J		13							B101-02	00:42
	SW7471A	TOTAL	N	0	1	MERCURY	.115	mg/kg	U	N	Y	U	U						B101-02	11:14			
YJ0007	SW6010B	SW3050	N	0	1	ALUMINUM	8910	mg/kg		Y	Y	P							B101-03	00:47			
						ANTIMONY	12.1	mg/kg	U	N	Y	U	UJ		08A						B101-03	00:47	
						ARSENIC	2.48	mg/kg		Y	Y	P										B101-03	22:07
						BARIIUM	117	mg/kg		Y	Y	P	J		08A							B101-03	00:47
						BERYLLIUM	.867	mg/kg	J	Y	Y	P	J		15							B101-03	00:47
						CADMIUM	.603	mg/kg	U	N	Y	U	U									B101-03	00:47
						CALCIUM	401	mg/kg		Y	Y	P										B101-03	00:47
						CHROMIUM	7.62	mg/kg		Y	Y	P	J		13							B101-03	00:47
						COBALT	10.6	mg/kg		Y	Y	P	J		13							B101-03	00:47
						COPPER	6.32	mg/kg		Y	Y	P										B101-03	00:47
						IRON	12400	mg/kg		Y	Y	P										B101-03	00:47
						LEAD	14.2	mg/kg		Y	Y	P										B101-03	22:07
						MAGNESIUM	362	mg/kg		Y	Y	P										B101-03	00:47
						MANGANESE	543	mg/kg		Y	Y	P										B101-03	00:47
						NICKEL	1.49	mg/kg	J	Y	Y	F	B		06B	13	15					B101-03	00:47
						POTASSIUM	551	mg/kg	J	Y	Y	P	J		15							B101-03	00:47
						SELENIUM	1.21	mg/kg	U	N	Y	U	U									B101-03	22:07
						SILVER	1.21	mg/kg	U	N	Y	U	U									B101-03	00:47
						SODIUM	24.3	mg/kg	J	Y	Y	P	J		15							B101-03	00:47
						THALLIUM	2.41	mg/kg	U	N	Y	U	U									B101-03	22:07
VANADIUM	12.4	mg/kg		Y	Y	P										B101-03	00:47						
ZINC	15.6	mg/kg		Y	Y	P	J		13							B101-03	00:47						
	SW7471A	TOTAL	N	0	1	MERCURY	.024	mg/kg	J	Y	Y	P	J		15			B101-03	11:16				
YJ0008	SW6010B	SW3050	N	0	1	ALUMINUM	13000	mg/kg		Y	Y	P						B101-04	00:52				
						ANTIMONY	11.6	mg/kg	U	N	Y	U	UJ		08A					B101-04	00:52		
						ARSENIC	5.44	mg/kg		Y	Y	P									B101-04	22:11	
						BARIIUM	57.5	mg/kg		Y	Y	P	J		08A						B101-04	00:52	
						BERYLLIUM	.482	mg/kg	J	Y	Y	P	J		15						B101-04	00:52	
						CADMIUM	.578	mg/kg	U	N	Y	U	U								B101-04	00:52	
						CALCIUM	71	mg/kg	J	Y	Y	P	J		15						B101-04	00:52	
						CHROMIUM	17.7	mg/kg		Y	Y	P	J		13						B101-04	00:52	
						COBALT	2.66	mg/kg		Y	Y	P	J		13						B101-04	00:52	
						COPPER	9.25	mg/kg		Y	Y	P									B101-04	00:52	
						IRON	25500	mg/kg		Y	Y	P									B101-04	00:52	
						LEAD	8.41	mg/kg		Y	Y	P									B101-04	22:11	
						MAGNESIUM	465	mg/kg		Y	Y	P									B101-04	00:52	

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 5 of 12

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10141Q-01																					
YJ0008	SW6010B	SW3050	N	0	1	MANGANESE	81.9	mg/kg		Y	Y	P								B101-04	00:52
						NICKEL	3.09	mg/kg		Y	Y	F	B		06B	13				B101-04	00:52
						POTASSIUM	1340	mg/kg		Y	Y	P								B101-04	00:52
						SELENIUM	1.16	mg/kg	U	N	Y	U	U							B101-04	22:11
						SILVER	1.16	mg/kg	U	N	Y	U	U							B101-04	00:52
						SODIUM	23.3	mg/kg	J	Y	Y	P	J		15					B101-04	00:52
						THALLIUM	2.31	mg/kg	U	N	Y	U	U							B101-04	22:11
						VANADIUM	23.1	mg/kg		Y	Y	P								B101-04	00:52
						ZINC	17.3	mg/kg		Y	Y	P	J		13					B101-04	00:52
	SW7471A	TOTAL	N	0	1	MERCURY	.023	mg/kg	J	Y	Y	P	J		15					B101-04	11:18
YJ0005	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						HMX	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						RDX	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
						TETRYL	.4	mg/kg	U	N	Y	U	U							B101-01	14:35
YJ0006	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						HMX	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						RDX	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
						TETRYL	.4	mg/kg	U	N	Y	U	U							B101-02	15:15
YJ0007	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B101-03	15:56
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B101-03	15:56

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 6 of 12

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
	Method:	Flt	REX							Dil:	Qlfr	Code:	1	2	3			4
10141Q-01																		
YJ0007	SW8330	METHOD	N	0	1	2,4,6-TNT	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						2,4-DNT	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						2,6-DNT	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						HMX	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						RDX	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
						TETRYL	.4	mg/kg	U	N	Y	U	U				B101-03	15:56
YJ0008	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						1,3-DNB	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						2,4-DNT	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						2,6-DNT	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						HMX	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						RDX	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
						TETRYL	.4	mg/kg	U	N	Y	U	U				B101-04	16:36
YJ0005	EPA314.0	NONE	N	0	1	PERCHLORATE	.0649	mg/kg	U	N	Y	U	U				B101-01	22:53
YJ0006	EPA314.0	NONE	N	0	1	PERCHLORATE	.0576	mg/kg	U	N	Y	U	U				B101-02	23:10
YJ0007	EPA314.0	NONE	N	0	1	PERCHLORATE	.0603	mg/kg	U	N	Y	U	U				B101-03	23:27
YJ0008	EPA314.0	NONE	N	0	1	PERCHLORATE	.0578	mg/kg	U	N	Y	U	U				B101-04	23:44
10141Q-02																		
YJ0003	SW6010B	SW3050	N	0	1	ALUMINUM	16500	mg/kg		Y	Y	P					D097-01	21:54
						ANTIMONY	12.2	mg/kg	U	N	Y	U	U				D097-01	21:54
						ARSENIC	2.98	mg/kg		Y	Y	P					D097-01	22:58
						BARIIUM	145	mg/kg		Y	Y	P					D097-01	21:54
						BERYLLIUM	.98	mg/kg	J	Y	Y	P	J	15			D097-01	21:54
						CADMIUM	.608	mg/kg	U	N	Y	U	U				D097-01	21:54
						CALCIUM	188	mg/kg		Y	Y	P					D097-01	21:54
						CHROMIUM	9.51	mg/kg		Y	Y	P					D097-01	21:54

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 7 of 12

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:							
													Qlfr	Code:	1	2	3	4									
10141Q-02																											
YJ0003	SW6010B	SW3050	N	0	1	COBALT	5.34	mg/kg		Y	Y	P								D097-01	21:54						
						COPPER	5.5	mg/kg		Y	Y	P											D097-01	21:54			
						IRON	13200	mg/kg		Y	Y	P												D097-01	21:54		
						LEAD	10.5	mg/kg		Y	Y	P												D097-01	22:58		
						MAGNESIUM	846	mg/kg		Y	Y	P												D097-01	21:54		
						MANGANESE	161	mg/kg		Y	Y	P												D097-01	21:54		
						NICKEL	5.45	mg/kg		Y	Y	P												D097-01	21:54		
						POTASSIUM	1520	mg/kg		Y	Y	P												D097-01	21:54		
						SELENIUM	1.22	mg/kg	U			N	Y	U	U									D097-01	22:58		
						SILVER	1.22	mg/kg	U			N	Y	U	U									D097-01	21:54		
						SODIUM	122	mg/kg	U			N	Y	U	U									D097-01	21:54		
						THALLIUM	2.43	mg/kg	U			N	Y	U	U									D097-01	22:58		
						VANADIUM	15.4	mg/kg				Y	Y	P										D097-01	21:54		
						ZINC	21.4	mg/kg				Y	Y	P										D097-01	21:54		
							SW7471A	TOTAL	N	0	1	MERCURY	.122	mg/kg	U		N	Y	U	U					D097-01	16:45	
						YJ0004	SW6010B	SW3050	N	0	1	ALUMINUM	12700	mg/kg		Y	Y	P								D097-02	21:59
												ANTIMONY	11.8	mg/kg	U			N	Y	U	U						
ARSENIC	5	mg/kg			Y							Y	P										D097-02	23:03			
BARIUM	71.8	mg/kg			Y							Y	P										D097-02	21:59			
BERYLLIUM	1.14	mg/kg	J									Y	Y	P	J				15				D097-02	21:59			
CADMIUM	.591	mg/kg	U									N	Y	U	U								D097-02	21:59			
CALCIUM	43.5	mg/kg	J									Y	Y	P	J				15				D097-02	21:59			
CHROMIUM	9.36	mg/kg										Y	Y	P										D097-02	21:59		
COBALT	1.31	mg/kg	J									Y	Y	F	B				06B	15			D097-02	21:59			
COPPER	7.86	mg/kg										Y	Y	P										D097-02	21:59		
IRON	6190	mg/kg										Y	Y	P										D097-02	21:59		
LEAD	11.7	mg/kg										Y	Y	P										D097-02	23:03		
MAGNESIUM	454	mg/kg										Y	Y	P										D097-02	21:59		
MANGANESE	8.16	mg/kg										Y	Y	P										D097-02	21:59		
NICKEL	2.15	mg/kg	J									Y	Y	P	J				15					D097-02	21:59		
POTASSIUM	4790	mg/kg										Y	Y	P										D097-02	21:59		
SELENIUM	1.18	mg/kg	U									N	Y	U	U									D097-02	23:03		
SILVER	1.18	mg/kg	U			N	Y	U	U									D097-02	21:59								
SODIUM	118	mg/kg	U			N	Y	U	U									D097-02	21:59								
THALLIUM	2.36	mg/kg	U			N	Y	U	U									D097-02	23:03								
VANADIUM	14	mg/kg				Y	Y	P										D097-02	21:59								
ZINC	11.6	mg/kg				Y	Y	P										D097-02	21:59								
	SW7471A	TOTAL	N	0	1	MERCURY	.118	mg/kg	U		N	Y	U	U					D097-02	16:47							
YJ0003	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U		N	Y	U	U					D097-01	21:02							
						1,3-DNB	.4	mg/kg	U		N	Y	U	U							D097-01	21:02					

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 8 of 12

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:									1	2	3	4		
10141Q-02																	
YJ0003	SW8330	METHOD	N 0 1	2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				HMX	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				RDX	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
				TETRYL	.4	mg/kg	U	N	Y	U	U					D097-01	21:02
YJ0004	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				HMX	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				RDX	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
				TETRYL	.4	mg/kg	U	N	Y	U	U					D097-02	21:40
YJ0003	E314.0	NONE	N 0 1	PERCHLORATE	.0608	mg/kg	U	N	Y	U	U					D097-01	00:21
YJ0004	E314.0	NONE	N 0 1	PERCHLORATE	.0591	mg/kg	U	N	Y	U	U					D097-02	00:38
10141Q-03																	
YJ0009	SW6010B	SW3050	N 0 1	ALUMINUM	13700	mg/kg		Y	Y	P						D236-01	22:35
				ANTIMONY	12.5	mg/kg	U	N	Y	U	U					D236-01	22:35
				ARSENIC	4.4	mg/kg		Y	Y	P						D236-01	22:26
				BARIUM	167	mg/kg		Y	Y	P						D236-01	22:35
				BERYLLIUM	1.05	mg/kg	J	Y	Y	P	J	15				D236-01	22:35
				CADMIUM	.624	mg/kg	U	N	Y	U	U					D236-01	22:35
				CALCIUM	502	mg/kg		Y	Y	P						D236-01	22:35
				CHROMIUM	7.62	mg/kg		Y	Y	P						D236-01	22:35
				COBALT	4.09	mg/kg		Y	Y	F	B	06B				D236-01	22:35
				COPPER	9.2	mg/kg		Y	Y	P						D236-01	22:35

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 9 of 12

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10141Q-03																					
YJ0009	SW6010B	SW3050	N	0	1	IRON	13900	mg/kg		Y	Y	P								D236-01	22:35
						LEAD	37.7	mg/kg		Y	Y	P								D236-01	22:26
						MAGNESIUM	635	mg/kg		Y	Y	P								D236-01	22:35
						MANGANESE	875	mg/kg		Y	Y	P								D236-01	22:35
						NICKEL	4.13	mg/kg		Y	Y	P								D236-01	22:35
						POTASSIUM	1540	mg/kg		Y	Y	P								D236-01	22:35
						SELENIUM	1.25	mg/kg	U	N	Y	U	U							D236-01	22:26
						SILVER	1.25	mg/kg	U	N	Y	U	U							D236-01	22:35
						SODIUM	125	mg/kg	U	N	Y	U	U							D236-01	22:35
						THALLIUM	2.5	mg/kg	U	N	Y	U	U							D236-01	22:26
						VANADIUM	12.5	mg/kg		Y	Y	P								D236-01	22:35
						ZINC	29.5	mg/kg		Y	Y	P								D236-01	22:35
	SW7471A	TOTAL	N	0	1	MERCURY	.060	mg/kg	J	Y	Y	P	J		15					D236-01	14:45
YJ0009	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						HMX	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						RDX	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
						TETRYL	.4	mg/kg	U	N	Y	U	U							D236-01	15:28
YJ0009	E314.0	NONE	N	0	1	PERCHLORATE	.0624	mg/kg	U	N	Y	U	U							D236-01	19:54
10141Q-04																					
YJ0010	SW6010B	SW3050	N	0	1	ALUMINUM	11700	mg/kg		Y	Y	P								E046-01	19:19
						ANTIMONY	11.2	mg/kg	U	N	Y	U	U							E046-01	19:19
						ARSENIC	6.12	mg/kg		Y	Y	P								E046-01	19:23
						BARIUM	163	mg/kg		Y	Y	P								E046-01	19:19
						BERYLLIUM	1.67	mg/kg		Y	Y	P								E046-01	19:19
						CADMIUM	.56	mg/kg	U	N	Y	U	U							E046-01	19:19
						CALCIUM	485	mg/kg		Y	Y	P								E046-01	19:19
						CHROMIUM	12.2	mg/kg		Y	Y	P								E046-01	19:19
						COBALT	17	mg/kg		Y	Y	P								E046-01	19:19
						COPPER	6.32	mg/kg		Y	Y	P								E046-01	19:19

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 10 of 12

Sample Number:	Analytical/Extraction Method:		Flt REX Dil:	Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:
										Qlfr	Code:	1	2	3	4		
10141Q-04																	
YJ0010	SW6010B	SW3050	N 0 1	IRON	39000	mg/kg		Y	Y	P						E046-01	19:19
				LEAD	20.1	mg/kg		Y	Y	P						E046-01	19:23
				MAGNESIUM	564	mg/kg		Y	Y	P						E046-01	19:19
				MANGANESE	1620	mg/kg		Y	Y	P						E046-01	19:19
				NICKEL	6.81	mg/kg		Y	Y	P						E046-01	19:19
				POTASSIUM	1410	mg/kg		Y	Y	P						E046-01	19:19
				SELENIUM	1.12	mg/kg	U	N	Y	U	U					E046-01	19:23
				SILVER	1.12	mg/kg	U	N	Y	U	U					E046-01	19:19
				SODIUM	112	mg/kg	U	N	Y	U	U					E046-01	19:19
				THALLIUM	1.23	mg/kg	J	Y	Y	P	J	15				E046-01	19:23
				VANADIUM	20.6	mg/kg		Y	Y	P						E046-01	19:19
				ZINC	25.4	mg/kg		Y	Y	P	J	11A	11B	13		E046-01	19:19
	SW7471A	TOTAL	N 0 1	MERCURY	.040	mg/kg	J	Y	Y	P	J	15				E046-01	10:47
YJ1002	SW6010B	SW3050	N 0 1	ALUMINUM	6040	mg/kg		Y	Y	P						E046-02	19:24
				ANTIMONY	15.7	mg/kg	U	N	Y	U	U					E046-02	19:24
				ARSENIC	1.73	mg/kg		Y	Y	P						E046-02	19:28
				BARIUM	68	mg/kg		Y	Y	P						E046-02	19:24
				BERYLLIUM	.715	mg/kg	J	Y	Y	P	J	15				E046-02	19:24
				CADMIUM	.787	mg/kg	U	N	Y	U	U					E046-02	19:24
				CALCIUM	141	mg/kg	J	Y	Y	P	J	15				E046-02	19:24
				CHROMIUM	5.09	mg/kg		Y	Y	P						E046-02	19:24
				COBALT	4.64	mg/kg		Y	Y	P						E046-02	19:24
				COPPER	5.63	mg/kg		Y	Y	P						E046-02	19:24
				IRON	8760	mg/kg		Y	Y	P						E046-02	19:24
				LEAD	8.5	mg/kg		Y	Y	P						E046-02	19:28
				MAGNESIUM	301	mg/kg		Y	Y	P						E046-02	19:24
				MANGANESE	69.4	mg/kg		Y	Y	P						E046-02	19:24
				NICKEL	3.96	mg/kg		Y	Y	P						E046-02	19:24
				POTASSIUM	1640	mg/kg		Y	Y	P						E046-02	19:24
				SELENIUM	1.57	mg/kg	U	N	Y	U	U					E046-02	19:28
				SILVER	1.57	mg/kg	U	N	Y	U	U					E046-02	19:24
				SODIUM	157	mg/kg	U	N	Y	U	U					E046-02	19:24
				THALLIUM	3.15	mg/kg	U	N	Y	U	U					E046-02	19:28
				VANADIUM	8.39	mg/kg		Y	Y	P						E046-02	19:24
				ZINC	15.8	mg/kg		Y	Y	P	J	11A	11B	13		E046-02	19:24
	SW7471A	TOTAL	N 0 1	MERCURY	.157	mg/kg	U	N	Y	U	U					E046-02	10:50
YJ0010	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					E046-01	23:40

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 11 of 12

Sample Number:	Analytical/Extraction			Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Method:	Flt	REX Dil:									1	2	3	4		
10141Q-04																	
YJ0010	SW8330	METHOD	N 0 1	2,6-DNT	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				HMX	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				RDX	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
				TETRYL	.4	mg/kg	U	N	Y	U	U					E046-01	23:40
YJ1002	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				HMX	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				RDX	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
				TETRYL	.4	mg/kg	U	N	Y	U	U					E046-02	00:18
YJ0010	E314.0	NONE	N 0 1	PERCHLORATE	.056	mg/kg	U	N	Y	U	U					E046-01	00:46
YJ1002	E314.0	NONE	N 0 1	PERCHLORATE	.0787	mg/kg	U	N	Y	U	U					E046-02	01:03
YJ1002	SW9060	NONE	N 0 1	TOC	40.5	mg/kg		Y	Y	P					E046-02	13:00	
10141Q-05																	
YJ2002	SW6010B	SW3010	N 0 1	ALUMINUM	.596	mg/L		Y	Y	P					E047-01	21:33	
				ANTIMONY	.1	mg/L	U	N	Y	U	U					E047-01	21:33
				ARSENIC	.01	mg/L	U	N	Y	U	U					E047-01	22:56
				BARIUM	.0355	mg/L		Y	Y	P					E047-01	21:33	
				BERYLLIUM	.001	mg/L	U	N	Y	U	U					E047-01	21:33
				CADMIUM	.01	mg/L	U	N	Y	U	U					E047-01	21:33
				CALCIUM	.17	mg/L	J	Y	Y	F	B	06B			E047-01	21:33	
				CHROMIUM	.01	mg/L	U	N	Y	U	U					E047-01	21:33
				COBALT	.02	mg/L	U	N	Y	U	U					E047-01	21:33
				COPPER	.02	mg/L	U	N	Y	U	U					E047-01	21:33
				IRON	.779	mg/L		Y	Y	P					E047-01	21:33	

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 12 of 12

Sample Number:	Analytical/Extraction Method:			Flt REX Dil:	Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
													1	2	3	4		
10141Q-05																		
YJ2002	SW6010B	SW3010	N 0 1	LEAD	.01	mg/L	U	N	Y	U	U					E047-01	22:56	
				MAGNESIUM	.233	mg/L	J	Y	Y	P	J	15				E047-01	21:33	
				MANGANESE	.0645	mg/L		Y	Y	P						E047-01	21:33	
				NICKEL	.02	mg/L	U	N	Y	U	U					E047-01	21:33	
				POTASSIUM	5	mg/L	U	N	Y	U	U					E047-01	21:33	
				SELENIUM	.01	mg/L	U	N	Y	U	U					E047-01	22:56	
				SILVER	.01	mg/L	U	N	Y	U	U					E047-01	21:33	
				SODIUM	1.01	mg/L		Y	Y	P						E047-01	21:33	
				THALLIUM	.01	mg/L	U	N	Y	U	U					E047-01	22:56	
				VANADIUM	.01	mg/L	U	N	Y	U	U					E047-01	21:33	
				ZINC	.02	mg/L	U	N	Y	U	U					E047-01	21:33	
	SW7470A	TOTAL	N 0 1	MERCURY	.0005	mg/L	U	N	Y	U	U					E047-01	16:16	
YJ2002	SW8330	METHOD	N 0 1	1,3,5-TNB	.0004	mg/L	U	N	Y	U	UJ	11B				E047-01	13:52	
				1,3-DNB	.0004	mg/L	U	N	Y	U	UJ	11B				E047-01	13:52	
				2,4,6-TNT	.0004	mg/L	U	N	Y	U	UJ	11B				E047-01	13:52	
				2,4-DNT	.0004	mg/L	U	N	Y	U	U					E047-01	13:52	
				2,6-DNT	.0004	mg/L	U	N	Y	U	U					E047-01	13:52	
				2-AM-4,6-DNT	.0004	mg/L	U	N	Y	U	U					E047-01	13:52	
				2-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					E047-01	13:52	
				3-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					E047-01	13:52	
				4-AM-2,6-DNT	.0004	mg/L	U	N	Y	U	U					E047-01	13:52	
				4-NITROTOLUENE	.0004	mg/L	U	N	Y	U	U					E047-01	13:52	
				HMX	.001	mg/L	U	N	Y	U	UJ	11B				E047-01	13:52	
				NITROBENZENE	.0004	mg/L	U	N	Y	U	U					E047-01	13:52	
				RDX	.0004	mg/L	U	N	Y	U	U					E047-01	13:52	
				TETRYL	.0004	mg/L	U	N	Y	U	UJ	11B				E047-01	13:52	
YJ2002	E314.0	NONE	N 0 1	PERCHLORATE	.005	mg/L	U	N	Y	U	U					E047-01	01:01	

**Quality Assurance Report
For the Artillery and Mortar Impact Areas
South of Bains Gap Road
Parcel HR-142Q
IT Project No 796887
Fort McClellan Quality Assurance Report**

1.0 Overview

Six soil samples were collected in support of the investigation at Fort McClellan (FTMC) Parcel HR-142Q, Artillery and Mortar Impact Areas South of Bains Gap Road. All samples were submitted to EMAX Laboratories, Inc. for analysis. Soil samples were analyzed for target analyte list (TAL) metals, nitroaromatic-nitramine explosives, and perchlorate. QC samples consisted of the following types and quantities: 2 equipment rinsates. An analytical summary table cross-referencing sample location, sample number, and contaminants of concern is presented in Attachment A.

One hundred (100) percent of samples were validated and reviewed in accordance with the *USEPA Contract Laboratory Program National Functional Guidelines for Evaluating Inorganic Data Review (EPA, February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines for Organic Review (EPA, October 1999)* for all areas except blanks. *Region III Laboratory Data Validation Functional Guidelines for Inorganic Analyses (EPA, April 1993)* and *Region III National Functional Guidelines for Organic Data Review (EPA, June 1992)* were applied to the areas associated with blank contamination. Data qualifiers assigned to results were based on guidance outlined in the referenced documents and the *Installation-Wide Sampling and Analysis Plan (IT, March 2000)* for FTMC. Table 1.0-1 and Table 1.0-2 define laboratory data and validation data qualifiers assigned to analytical results, respectively.

**Table 1.0-1
Laboratory Data Qualifier Definitions**

Data Qualifier	Laboratory Data Qualifier Definition
B	Analyte detected in method blank at concentration greater than the reporting limit (and greater than zero).
C	Confirming data obtained using second GC column or GC/MS.
E	Analyte concentration exceeded calibration range.
I	Analyte identification suspect. See narrative for explanation.
J	Result is less than or equal to specified reporting limit but greater than the method detection limit (MDL).
P	Analyte not confirmed. Results from primary and secondary GC columns differ by greater than 10 percent
S	Analyte concentration obtained using Method of Standard Additions (MSA).
U	Not detected. The value represented indicates the reporting limit for the analysis.
D	Sample analyzed as a dilution. The result reported has been calculated using the appropriate dilution factor.
No Code	Confirmed identification.

**Table 1.0-2
Validation Data Qualifier Definitions**

Validation Qualifier	Validation Data Qualifier Definition
U	Not detected. The associated number indicates approximate sample concentration necessary to be detected.
No Code	Confirmed identification
B	Not detected substantially above the level reported in laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
N	Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise. Considered an estimate.
NJ	Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

The Data Validation Summary Report is presented in Attachment B.

2.0 Summary

Data were evaluated to verify compliance with precision, accuracy, representativeness, comparability, completeness, and sensitivity. To verify that project data quality objectives (DQO) were met, laboratory analytical results and data packages were examined for compliance with SW846 SW6010B/SW7000 Series, SW8330 and U.S. Environmental Protection Agency (EPA) 314.0 quality control (QC) method criteria. Laboratory nonconformances and discrepancies in the data were also examined to determine their impact on the data. The results of this review are presented in the following sections.

2.1 Sample Receipt and Analytical Holding Times

All sample results generated by the laboratory during this investigation have been reviewed with respect to condition of samples as received by the laboratory, chain-of-custody, and analysis holding times. All coolers were received by EMAX in good condition under proper chain-of-custody.

All extraction and analytical holding times were met.

2.2 Rejected Data

No data were qualified by the laboratory or after validation was completed as being rejected ("R"-flagged).

2.3 Blank Results

A description of the types of blank samples which were collected, processed, and evaluated for background and/or process contamination during this sampling is as follows:

- Equipment rinsates (ER) are samples of analyte-free deionized water poured into, or over, or pumped through the sampling device, collected in a sample container, and transported to the laboratory for analysis. Equipment rinsates are used to assess the effectiveness of equipment decontamination procedures.
- Method blanks (MB) are used in the laboratory to assess and document any possible contamination resulting from the analytical process. A method blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank shall be carried through the complete sample preparation and analytical procedure.
- Initial and continuing calibration blanks (ICB and CCB) are an analyte-free matrix which is analyzed to verify the analysis system is free of contamination. ICBs and CCBs are analyzed immediately after the initial and continuing calibration is performed.

Field sample concentrations were evaluated to determine if the sample results could have been biased by the presence of any contamination measured in equipment rinsate blanks, method blanks and/or initial/continuing calibration blanks. Sample data affected by blank contamination are summarized in Table 2.3-1.

**Table 2.3-1
Summary of Blank Contamination**

Sample Delivery Group	Sample Number	Contaminant	Action
10142Q-01	YL0001, YL0002 & YL0003	Potassium Cobalt	Potassium and cobalt results for samples YL0001, YL0002 and YL0003 were "B" qualified.
	YL0004	Zinc	Zinc result for sample YL0004 was "B" qualified.
10142Q-02	YL0006	Beryllium Potassium	Beryllium and potassium results for sample YL0006 was "B" qualified.

2.4 Analytical Precision

Precision is defined as a measurement of mutual agreement among individual measurements of the same property, usually under "prescribed similar conditions." Analytical precision is calculated as relative percent difference (%RPD) based on the following formula:

$$\%RPD = \frac{|(A-B)|}{(A+B)/2} \times 100$$

where:

- %RPD = Relative Percent Difference
- A = original result
- B = duplicate result

A high RPD between an original sample and its field duplicate may be attributable to the difference in sample matrix or distribution of the contaminant within the sample, rather than the precision of the collection process. Also, when "estimated" results are reported, there is a potential for increased variability between the primary and duplicate sample results. This occurs because, at low concentrations, the relative difference in results is magnified by the RPD calculation even though the results are comparable in absolute terms. There is also increased uncertainty in the results as the lower limit of detection is approached, due to decreasing analytical accuracy. The RPD calculation cannot be performed in cases where non-detected results are reported with corresponding samples that contain detectable concentrations.

Overall sampling and analysis precision for this task was assessed using field duplicate (FD) samples. Laboratory precision was assessed by laboratory control sample/laboratory control sample duplicate (LCS/LCSD) and matrix spike/matrix spike duplicate (MS/MSD) recoveries. Results indicate that an acceptable analytical precision was achieved. Table 2.4-1 lists precision

acceptance criteria for LCS/LCSD, MS/MSD organic and inorganic analyses and field duplicate comparisons.

**Table 2.4-1
Precision Acceptance Criteria**

Field/Laboratory QC Type	Matrix
	Soil
Field Duplicate (Both Organic & Inorganic)	RPD < 50%
Perchlorate LCS/LCSD and MS/MSD	RPD < 20%
Nitroaromatic and Nitramine Explosives LCS/LCSD and MS/MSD	Refer to Table 8-1 of FTMC "Installation Wide Sample and Analysis Plan"
Metals LCS/LCSD and MS/MSD	RPD < 20%

2.5 Analytical Accuracy Assessment

Accuracy is a measure of the degree of agreement of a result against an accepted reference or true value. Accuracy is expressed as a percent recovery (%R) calculated by the ratio of the measurement and accepted true value as shown in the following equation:

$$\%R = (|X_s - X_u|/K) \times 100$$

where:

- X_s = measured value of the spiked sample
- X_u = measured value of the unspiked sample
- K = known amount of the spike in the sample

Surrogate recoveries, MS/MSD and LCS/LCSD, were used to measure analytical accuracy as described in SW846 SW8330, SW6010B/SW7000 and EPA 314.0. Reported results indicate that an acceptable level of analytical accuracy was achieved.

2.6 Data Representativeness

Representativeness is a qualitative parameter that expresses the degree to which sample data actually represent the matrix conditions. Sample locations selected for this investigation outline contaminant releases into the environment, that may have occurred and will confirm whether contaminated soil exists at this site. Soil sample data are being used to assess potential impacts to terrestrial biota that might use the site for food and/or habitat purposes.

Standardized requirements and procedures for sample collection and handling were employed to maximize sample representativeness.

2.7 Data Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. By employing well-recognized techniques and accepted standardized methods for sampling and analysis, data comparability was achieved during this sampling event.

2.8 Data Completeness

Completeness is calculated for the aggregation of data for each analyte measured during the investigation of Parcel HR-142Q Artillery and Mortar Impact Areas South of Bains Gap Road. The formula for calculating completeness is listed below:

$$\% \text{ Completeness} = (X_V / X_T) \times 100$$

where:

X_V = number of valid (i.e., non-“R”-flagged) results
 X_T = number of possible results

Parcel HR-142Q goal for completeness is 95% for both aqueous and soil samples. The % Completeness for this task is calculated to be 100%.

- % Completeness = (228 / 228) x 100 = 100%

2.9 Sensitivity

Sensitivity is defined as the ability of the laboratory's established method detection limits (MDL)/method reporting limits (MRL or RL) to meet project-specific DQOs or site-specific screening levels (SSSL) and or ecological screening values (ESV).

MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. MDLs are determined from an analysis of a sample in a given matrix containing the target analyte of interest. The MRL is a threshold value based upon the sensitivity capability of method and instrument. MRLs are normally set at a minimum of two times the MDL. MRLs are adjusted based on the sample matrix, moisture (solids only), and any necessary sample dilutions. The laboratory cannot reliably quantitate values reported above the MDL but below the MRL. Therefore, these analyte values must be flagged as estimated quantities (“J”-flagged).

To evaluate method sensitivity, a general comparison of the laboratory's MDLs/MRLs and the site investigation screening levels (background values, human health SSSL for residential reuse, and [ESV]) was performed and presented to the FTMC Base Realignment and Closure Team (BCT) (November 1999). The comparison summarized the relationship between the MDL/MRLs and SSSL/ESVs for each parameter typically reported for all of the major analytical methods used at FTMC. The few cases identified where the MDL and/or MRL values exceeded their corresponding human health SSSL and/or ESV were specifically highlighted and explained. It was understood that for these cases, the standard analytical method of analysis was not going to provide MDLs/MRLs which met human health SSSLs or ESVs without significant uncertainty and the possibility of reporting false negatives. It was generally accepted that standard EPA SW846 analytical methods would provide sufficient sensitivity for data reported and used in the site screening process at FTMC.

3.0 Data Usability

Data quality indicators (DQI) provide an internal guide for control and review to verify that data are scientifically sound, defensible, and of known and acceptable quality. Factors such as precision, accuracy, representativeness, comparability, completeness, and sensitivity were evaluated to determine if the project's DQOs were met. A review of the data revealed that the majority of QA/QC indicators were within acceptable control limits. Any data anomalies encountered during data validation and overall site evaluations have been summarized in the previous sections of this document.

Based on the results of data validation and QA review, IT has concluded that representative samples were collected and analyzed and that the results are indicative of the media analyzed. The data are to be considered representative of site conditions and are usable for their intended purpose.

4.0 Attachments

Attachment A - Analytical Summary Table

Attachment B - Data Validation Summary Report

ATTACHMENT A
ANALYTICAL SUMMARY TABLE

Ft. McClellan
Parcel HR-142Q
Artillery and Mortar Impact Areas South of Bains Gap Road
Analytical Summary
Project No. 796887

HR-142Q Soil Sampling

Sample Location	Sample Name	Sample Number	Date Sampled	Analytical Suite
HR-142Q-GP01	HR-142Q-GP01-SS-YL0001-REG	YL0001	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-142Q-GP01-DS-YL0002-REG	YL0002	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-142Q-GP02	HR-142Q-GP02-SS-YL0003-REG	YL0003	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
	HR-142Q-GP02-DS-YL0004-REG	YL0004	08-Feb-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-142Q-DEP01	HR-142Q-DEP01-SS-YL0005-REG	YL0005	24-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.
HR-142Q-DEP02	HR-142Q-DEP02-SS-YL0006-REG	YL0006	24-Apr-01	TAL Metals by SW6010B/SW7471, Nitroaromatic-Nitramine Explosives by SW8330 & Perchlorate by EPA 314.0.

ATTACHMENT B
DATA VALIDATION SUMMARY REPORT

**Data Validation Summary Report
for the Site Investigation Performed at the
Artillery and Mortar Impact Areas South of Bains Gap (Parcel HR-142Q)
Fort McCellan**

1.0 Introduction

Level III data validation was performed on 100% of the environmental samples collected at Artillery and Mortar Impact Areas South of Bains Gap (Parcel HR-142Q). The analytical data consisted of two sample delivery groups (SDG) 10142Q-01 and 10142Q-02, which were analyzed by EMAX Laboratories. The chemical parameters for which the samples were analyzed, are identified below:

Parameter (Method)
Metals by SW846 6010B and 7471A/7470A
Nitroaromatic and Nitramine Explosives by SW846 8330
Perchlorate by EPA 314.0

2.0 Procedures

The sample data were validated following the logic identified in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines For Inorganic Data Review (February 1994)* and *USEPA Contract Laboratory Program National Functional Guidelines For Organic Review (October 1999)* for all areas except Blanks. *Region III Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses (April 1993)* and *Region III National Functional Guidelines for Organic Data Review (June 1992)* were applied to the areas associated with blank contamination. Specific quality control (QC) criteria, as identified in the Quality Assurance Plan (QAP), analytical methods, and laboratory Standard Operating Procedures (SOP's) were applied to all sample results. As the result of the use of Update III SW846 test methods for the analytical data and the application of the CLP guidelines during the validation process, there were instances where specific QC requirements for all target compounds were not defined. This primarily occurred in the organic, Gas Chromatograph (GC) and Gas Chromatograph/Mass Spectra (GC/MS) calibration areas and is due to the fact that the analytical methods are "performance-based", and allows the use of average calibration responses, in lieu of, individual responses, which are defined by CLP protocol. In light of applying CLP guidelines to SW846 methods and evaluating the usability of the data during the validation process, specific QC criteria were determined to address all target compounds and are identified in this report for each parameter, as well as, in the validation checklists, which function as worksheets. All completed validation checklists are on file in the Knoxville office.

For those analytical methods not addressed by the CLP and Region III guidelines, the validation was based on the method requirements (i. e. SW846, CFR, SOP's, QAP) and technical judgement following the logic of the CLP validation guidelines.

3.0 Summary of Data Validation Findings

The overall quality of the data was determined to be acceptable with minimal qualification. No data were rejected.

Individual validation reports have been prepared for each parameter in each SDG and the overall results of the validation findings are summarized in this report. The validation qualifier data entry verification report (Attachment A) is also provided. This is a complete listing of all of the analytical results and the validation qualifiers assigned for Parcel HR-142Q. It also identifies the 'use' column, which indicates which result to use in the event of a reanalysis. A listing of the validation qualifiers and the reason codes, along with their definitions is also found in Attachment A. The following section highlights the key findings of the data validation for each analysis.

4.0 Analysis-Specific Data Validation Summaries

4.1 Metals by SW846 6010B/7471A/7470A

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing calibrations

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinse, calibration, and method blanks was applied to all sample results. All were acceptable with the exception of the following:

Note: 'B' Qualifiers were applied to all of the following sample results.

SDG	Samples Affected	Analyte/Analytes	Associated Blank Contamination
10142Q-01	YL0001, YL0002, YL0003	Potassium, Cobalt	Method/Calib
	YL0004	Zinc	Calibration
10142Q-02	YL0006	Beryllium, Potassium	Calibration

'B' qualifiers assigned to designate blank contamination, which are identification qualifiers, take precedence over estimating qualifiers, assigned due to quantitation.

Matrix Spike / Matrix Spike Duplicate

No MS/MSD were performed for the project samples.

Laboratory Control Sample (LCS)

All QC criteria were met for the LCS associated with the project sample analyses.

Interference Check Sample (ICS)

All ICS % recoveries for the project samples were acceptable.

ICP Serial Dilutions

No associated serial dilution samples were performed for the project samples.

Field Duplicates

No field duplicates were associated with this SDG.

Sample Quantitation

Results quantified between the IDL and the RL ("J" flagged by the laboratory) were qualified as estimated (J).

4.2 Nitroaromatic and Nitramine Explosives by SW846 8330

Overall, the data are of good quality and are usable as reported by the laboratory with the exceptions noted below. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Surrogate Recoveries

All surrogate recoveries are within acceptable QC ranges.

Matrix Spike / Matrix Spike Duplicate

No MS/MSD were performed for the project samples.

Laboratory Control Sample (LCS)

LCS was performed for the project samples and all QC criteria were met.

Field Duplicates

No field duplicates were associated with this SDG.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as "J," were qualified as estimated 'J' unless blank contamination was present or the results were rejected.

4.3 Perchlorate by EPA 314.0

Overall, the data are of good quality and are usable as reported by the laboratory. Data were reviewed for the following:

Holding Times

Technical holding time criteria were met for all samples.

Initial and Continuing Calibration

All initial and continuing calibrations associated with the project samples met QC criteria.

Blanks

The 5X rule for contaminants found in the associated equipment rinses and method blanks was applied to all sample results. All were found to be acceptable.

Matrix Spike / Matrix Spike Duplicate

No MS/MSD were performed for the project samples.

Laboratory Control Sample (LCS)

All QC criteria were met for the LCS associated with the project sample analyses.

Field Duplicates

No field duplicates were associated with this SDG.

Quantitation

Results quantified between the MDL and the RL, which the lab qualified as 'J' were qualified as estimated 'J' unless blank contamination was present or the results were rejected.

Attachment A:
Data Validation Qualifier Entry Verification Report

Validation Qualifiers

- U Not detected. The compound/analyte was analyzed for, but not detected above the associated reporting limit.
- J The compound/analyte was positively identified; the reported value is the estimated concentration of the constituent detected in the sample analyzed.
- B The concentration reported was detected significantly above the levels reported in the associated equipment rinse samples and/or laboratory method and trip blanks. (5X/10X Rule was applied).
- R The reported sample results are rejected due to the following:
1. Severe deficiencies in the supporting quality control data.
 2. Anomalies noted in the sampling and/or analysis process which could affect the validity of the reported data.
 3. The presence or absence of the constituent cannot be verified based on the data provided.
 4. To indicate not to use a particular result in the event of a reanalysis.
- UJ The compound/analyte was analyzed for, but not detected above the established reporting limit. However, review and evaluation of supporting QC data and/or sampling and analysis process have indicated that the “nondetect” may be inaccurate or imprecise. The nondetect result should be estimated.

Validation Reason Code Definitions

Reason Code	Description
01	Sample received outside of 4+/-2 degrees Celsius
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A	BFB
03B	DFTPP
03C	DDT and/or Endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	Initial calibration results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	Correlation coefficient >0.995
05	Continuing calibration results outside specified criteria
05A	Compound mean RRF QC criteria not met
05B	Compound % D QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated method blank or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09	Post digestion spike outside criteria (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	Laboratory control sample recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12	Interference check standard
13	Serial dilution
14	Tentatively identified compounds
15	Quantitation
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18	Percent difference between original and second column exceeds QC criteria
19	Professional judgement was used to qualify the data
20	Pesticide clean-up checks
21	Target compound identification
22	Radiological calibration
23	Radiological quantitation
24	Reported result and/or lab qualifier revised to reflect validation findings

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 1 of 6

Sample Number:	Analytical/Extraction Method:			Flt REX Dil:	Parameter:	Result:	Units:	Qlfr:	Hit Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:
											Qlfr	Code:	1	2	3	4		
10142Q-01																		
YL0001	SW6010B	SW3050	N 0 1	ALUMINUM	7090	mg/kg			Y	Y	P						B095-01	18:42
				ANTIMONY	12.2	mg/kg	U		N	Y	U	U					B095-01	18:42
				ARSENIC	1.14	mg/kg	J		Y	Y	P	J	15				B095-01	18:12
				BARIIUM	60.7	mg/kg			Y	Y	P						B095-01	18:42
				BERYLLIUM	.313	mg/kg	J		Y	Y	P	J	15				B095-01	18:42
				CADMIUM	.608	mg/kg	U		N	Y	U	U					B095-01	18:42
				CALCIUM	185	mg/kg			Y	Y	P						B095-01	18:42
				CHROMIUM	4.05	mg/kg			Y	Y	P						B095-01	18:42
				COBALT	1.85	mg/kg	J		Y	Y	F	B	06B	15			B095-01	18:42
				COPPER	3.13	mg/kg			Y	Y	P						B095-01	18:42
				IRON	5900	mg/kg			Y	Y	P						B095-01	18:42
				LEAD	10.7	mg/kg			Y	Y	P						B095-01	18:12
				MAGNESIUM	184	mg/kg			Y	Y	P						B095-01	18:42
				MANGANESE	39.1	mg/kg			Y	Y	P						B095-01	18:42
				NICKEL	2.2	mg/kg	J		Y	Y	P	J	15				B095-01	18:42
				POTASSIUM	342	mg/kg	J		Y	Y	F	B	06A	15			B095-01	18:42
				SELENIUM	1.22	mg/kg	U		N	Y	U	U					B095-01	18:12
				SILVER	1.22	mg/kg	U		N	Y	U	U					B095-01	18:42
				SODIUM	122	mg/kg	U		N	Y	U	U					B095-01	18:42
				THALLIUM	2.43	mg/kg	U		N	Y	U	U					B095-01	18:12
				VANADIUM	7.8	mg/kg			Y	Y	P						B095-01	18:42
				ZINC	7.02	mg/kg			Y	Y	P						B095-01	18:42
	SW7471A	TOTAL	N 0 1	MERCURY	.035	mg/kg	J		Y	Y	P	J	15				B095-01	17:00
YL0002	SW6010B	SW3050	N 0 1	ALUMINUM	9730	mg/kg			Y	Y	P						B095-02	18:46
				ANTIMONY	11.7	mg/kg	U		N	Y	U	U					B095-02	18:46
				ARSENIC	1.43	mg/kg			Y	Y	P						B095-02	18:16
				BARIIUM	45.2	mg/kg			Y	Y	P						B095-02	18:46
				BERYLLIUM	.381	mg/kg	J		Y	Y	P	J	15				B095-02	18:46
				CADMIUM	.585	mg/kg	U		N	Y	U	U					B095-02	18:46
				CALCIUM	122	mg/kg			Y	Y	P						B095-02	18:46
				CHROMIUM	9.59	mg/kg			Y	Y	P						B095-02	18:46
				COBALT	1.3	mg/kg	J		Y	Y	F	B	06B	15			B095-02	18:46
				COPPER	4.37	mg/kg			Y	Y	P						B095-02	18:46
				IRON	17200	mg/kg			Y	Y	P						B095-02	18:46
				LEAD	9.2	mg/kg			Y	Y	P						B095-02	18:16
				MAGNESIUM	193	mg/kg			Y	Y	P						B095-02	18:46
				MANGANESE	29.1	mg/kg			Y	Y	P						B095-02	18:46
				NICKEL	3.01	mg/kg			Y	Y	P						B095-02	18:46
				POTASSIUM	322	mg/kg	J		Y	Y	F	B	06A	15			B095-02	18:46
				SELENIUM	1.17	mg/kg	U		N	Y	U	U					B095-02	18:16

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 2 of 6

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:		
													Qlfr	Code:	1	2	3	4				
10142Q-01																						
YL0002	SW6010B	SW3050	N	0	1	SILVER	1.17	mg/kg	U	N	Y	U	U							B095-02	18:46	
						SODIUM	117	mg/kg	U	N	Y	U	U								B095-02	18:46
						THALLIUM	2.34	mg/kg	U	N	Y	U	U								B095-02	18:16
						VANADIUM	12.6	mg/kg		Y	Y	P									B095-02	18:46
						ZINC	7.92	mg/kg		Y	Y	P									B095-02	18:46
	SW7471A	TOTAL	N	0	1	MERCURY	.117	mg/kg	U	N	Y	U	U								B095-02	17:02
YL0003	SW6010B	SW3050	N	0	1	ALUMINUM	8110	mg/kg		Y	Y	P									B095-03	18:51
						ANTIMONY	12	mg/kg	U	N	Y	U	U								B095-03	18:51
						ARSENIC	1.07	mg/kg	J	Y	Y	P	J	15							B095-03	18:20
						BARIUM	45.9	mg/kg		Y	Y	P									B095-03	18:51
						BERYLLIUM	.24	mg/kg	J	Y	Y	P	J	15							B095-03	18:51
						CADMIUM	.599	mg/kg	U	N	Y	U	U								B095-03	18:51
						CALCIUM	95.8	mg/kg	J	Y	Y	P	J	15							B095-03	18:51
						CHROMIUM	7.08	mg/kg		Y	Y	P									B095-03	18:51
						COBALT	1.31	mg/kg	J	Y	Y	F	B	06B	15						B095-03	18:51
						COPPER	3.72	mg/kg		Y	Y	P									B095-03	18:51
						IRON	7250	mg/kg		Y	Y	P									B095-03	18:51
						LEAD	6.7	mg/kg		Y	Y	P									B095-03	18:20
						MAGNESIUM	196	mg/kg		Y	Y	P									B095-03	18:51
						MANGANESE	38.4	mg/kg		Y	Y	P									B095-03	18:51
						NICKEL	1.98	mg/kg	J	Y	Y	P	J	15							B095-03	18:51
						POTASSIUM	345	mg/kg	J	Y	Y	F	B	06A	15						B095-03	18:51
						SELENIUM	1.2	mg/kg	U	N	Y	U	U								B095-03	18:20
						SILVER	1.2	mg/kg	U	N	Y	U	U								B095-03	18:51
						SODIUM	120	mg/kg	U	N	Y	U	U								B095-03	18:51
						THALLIUM	2.4	mg/kg	U	N	Y	U	U								B095-03	18:20
						VANADIUM	9.16	mg/kg		Y	Y	P									B095-03	18:51
						ZINC	6.81	mg/kg		Y	Y	P									B095-03	18:51
	SW7471A	TOTAL	N	0	1	MERCURY	.12	mg/kg	U	N	Y	U	U								B095-03	17:05
YL0004	SW6010B	SW3050	N	0	1	ALUMINUM	7110	mg/kg		Y	Y	P									B095-04	18:55
						ANTIMONY	11.9	mg/kg	U	N	Y	U	U								B095-04	18:55
						ARSENIC	4.46	mg/kg		Y	Y	P									B095-04	18:24
						BARIUM	36.9	mg/kg		Y	Y	P									B095-04	18:55
						BERYLLIUM	.227	mg/kg	J	Y	Y	P	J	15							B095-04	18:55
						CADMIUM	.595	mg/kg	U	N	Y	U	U								B095-04	18:55
						CALCIUM	14.5	mg/kg	J	Y	Y	P	J	15							B095-04	18:55
						CHROMIUM	7.06	mg/kg		Y	Y	P									B095-04	18:55
						COBALT	2.38	mg/kg	U	N	Y	U	U								B095-04	18:55
						COPPER	4.81	mg/kg		Y	Y	P									B095-04	18:55
						IRON	6340	mg/kg		Y	Y	P									B095-04	18:55

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 3 of 6

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10142Q-01																					
YL0004	SW6010B	SW3050	N	0	1	LEAD	4.48	mg/kg		Y	Y	P								B095-04	18:24
						MAGNESIUM	113	mg/kg	J	Y	Y	P	J	15						B095-04	18:55
						MANGANESE	1.57	mg/kg		Y	Y	P								B095-04	18:55
						NICKEL	1.47	mg/kg	J	Y	Y	P	J	15						B095-04	18:55
						POTASSIUM	2790	mg/kg		Y	Y	P								B095-04	18:55
						SELENIUM	1.19	mg/kg	U	N	Y	U	U							B095-04	18:24
						SILVER	1.19	mg/kg	U	N	Y	U	U							B095-04	18:55
						SODIUM	119	mg/kg	U	N	Y	U	U							B095-04	18:55
						THALLIUM	2.38	mg/kg	U	N	Y	U	U							B095-04	18:24
						VANADIUM	10.3	mg/kg		Y	Y	P								B095-04	18:55
						ZINC	1.2	mg/kg	J	Y	Y	F	B	06B	15					B095-04	18:55
	SW7471A	TOTAL	N	0	1	MERCURY	.119	mg/kg	U	N	Y	U	U							B095-04	17:07
YL0001	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						HMX	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						RDX	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
						TETRYL	.4	mg/kg	U	N	Y	U	U							B095-01	11:57
YL0002	SW8330	METHOD	N	0	1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						1,3-DNB	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						2,4-DNT	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						2,6-DNT	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						HMX	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						NITROBENZENE	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						RDX	.4	mg/kg	U	N	Y	U	U							B095-02	12:38
						TETRYL	.4	mg/kg	U	N	Y	U	U							B095-02	12:38

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 4 of 6

Sample Number:	Analytical/Extraction Method:			Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val Qlfr	Val Code:	Reason Codes				Lab Sample:	Analysis Time:
	Flt	REX	Dil:										1	2	3	4		
10142Q-01																		
YL0003	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				HMX	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				RDX	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
				TETRYL	.4	mg/kg	U	N	Y	U	U					B095-03	13:18	
YL0004	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				1,3-DNB	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				2,4-DNT	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				2,6-DNT	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				HMX	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				RDX	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
				TETRYL	.4	mg/kg	U	N	Y	U	U					B095-04	13:59	
YL0001	EPA314.0	NONE	N 0 1	PERCHLORATE	.0319	mg/kg	J	Y	Y	P	J	15				B095-01	02:27	
YL0002	EPA314.0	NONE	N 0 1	PERCHLORATE	.0585	mg/kg	U	N	Y	U	U					B095-02	02:44	
YL0003	EPA314.0	NONE	N 0 1	PERCHLORATE	.0599	mg/kg	U	N	Y	U	U					B095-03	03:01	
YL0004	EPA314.0	NONE	N 0 1	PERCHLORATE	.0595	mg/kg	U	N	Y	U	U					B095-04	03:18	
10142Q-02																		
YL0005	SW6010B	SW3050	N 0 1	ALUMINUM	10400	mg/kg		Y	Y	P						D237-01	22:40	
				ANTIMONY	11.7	mg/kg	U	N	Y	U	U					D237-01	22:40	
				ARSENIC	4.66	mg/kg		Y	Y	P						D237-01	22:31	
				BARIIUM	109	mg/kg		Y	Y	P						D237-01	22:40	
				BERYLLIUM	1.09	mg/kg	J	Y	Y	P	J	15				D237-01	22:40	
				CADMIUM	.587	mg/kg	U	N	Y	U	U					D237-01	22:40	

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 5 of 6

Sample Number:	Analytical/Extraction Method:		Flt	REX	Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
													Qlfr	Code:	1	2	3	4			
10142Q-02																					
YL0005	SW6010B	SW3050	N	0	1	CALCIUM	277	mg/kg		Y	Y	P								D237-01	22:40
						CHROMIUM	9.44	mg/kg		Y	Y	P								D237-01	22:40
						COBALT	6.48	mg/kg		Y	Y	P								D237-01	22:40
						COPPER	11.2	mg/kg		Y	Y	P								D237-01	22:40
						IRON	28000	mg/kg		Y	Y	P								D237-01	22:40
						LEAD	24.1	mg/kg		Y	Y	P								D237-01	22:31
						MAGNESIUM	468	mg/kg		Y	Y	P								D237-01	22:40
						MANGANESE	459	mg/kg		Y	Y	P								D237-01	22:40
						NICKEL	5.6	mg/kg		Y	Y	P								D237-01	22:40
						POTASSIUM	1830	mg/kg		Y	Y	P								D237-01	22:40
						SELENIUM	1.17	mg/kg	U	N	Y	U	U							D237-01	22:31
						SILVER	1.17	mg/kg	U	N	Y	U	U							D237-01	22:40
						SODIUM	117	mg/kg	U	N	Y	U	U							D237-01	22:40
						THALLIUM	.9	mg/kg	J	Y	Y	P	J	15						D237-01	22:31
						VANADIUM	14.9	mg/kg		Y	Y	P								D237-01	22:40
						ZINC	26.5	mg/kg		Y	Y	P								D237-01	22:40
	SW7471A	TOTAL	N	0	1	MERCURY	.117	mg/kg	U	N	Y	U	U							D237-01	15:08
YL0006	SW6010B	SW3050	N	0	1	ALUMINUM	12200	mg/kg		Y	Y	P								D237-02	22:46
						ANTIMONY	13.2	mg/kg	U	N	Y	U	U							D237-02	22:46
						ARSENIC	6.5	mg/kg		Y	Y	P								D237-02	22:36
						BARIUM	120	mg/kg		Y	Y	P								D237-02	22:46
						BERYLLIUM	.975	mg/kg	J	Y	Y	F	B	06B	15					D237-02	22:46
						CADMIUM	.659	mg/kg	U	N	Y	U	U							D237-02	22:46
						CALCIUM	265	mg/kg		Y	Y	P								D237-02	22:46
						CHROMIUM	17.2	mg/kg		Y	Y	P								D237-02	22:46
						COBALT	10.3	mg/kg		Y	Y	P								D237-02	22:46
						COPPER	7.57	mg/kg		Y	Y	P								D237-02	22:46
						IRON	37200	mg/kg		Y	Y	P								D237-02	22:46
						LEAD	30.6	mg/kg		Y	Y	P								D237-02	22:36
						MAGNESIUM	516	mg/kg		Y	Y	P								D237-02	22:46
						MANGANESE	881	mg/kg		Y	Y	P								D237-02	22:46
						NICKEL	5.62	mg/kg		Y	Y	P								D237-02	22:46
						POTASSIUM	1070	mg/kg		Y	Y	F	B	06B						D237-02	22:46
						SELENIUM	1.32	mg/kg	U	N	Y	U	U							D237-02	22:36
						SILVER	1.32	mg/kg	U	N	Y	U	U							D237-02	22:46
						SODIUM	132	mg/kg	U	N	Y	U	U							D237-02	22:46
						THALLIUM	1.01	mg/kg	J	Y	Y	P	J	15						D237-02	22:36
						VANADIUM	24.9	mg/kg		Y	Y	P								D237-02	22:46
						ZINC	24.9	mg/kg		Y	Y	P								D237-02	22:46
	SW7471A	TOTAL	N	0	1	MERCURY	.132	mg/kg	U	N	Y	U	U							D237-02	15:10

Validation Qualifier Data Entry Verification

Run Date: October 11, 2001

Page: 6 of 6

Sample Number:	Analytical/Extraction Method:	Flt	REX Dil:	Parameter:	Result:	Units:	Qlfr:	Hit	Use	BCF	Val	Val	Reason Codes				Lab Sample:	Analysis Time:	
											Qlfr	Code:	1	2	3	4			
10142Q-02																			
YL0005	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				1,3-DNB	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				2,4-DNT	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				2,6-DNT	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				HMX	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				RDX	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
				TETRYL	.4	mg/kg	U	N	Y	U	U							D237-01	16:06
YL0006	SW8330	METHOD	N 0 1	1,3,5-TNB	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				1,3-DNB	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				2,4,6-TNT	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				2,4-DNT	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				2,6-DNT	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				2-AM-4,6-DNT	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				2-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				3-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				4-AM-2,6-DNT	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				4-NITROTOLUENE	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				HMX	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				NITROBENZENE	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				RDX	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
				TETRYL	.4	mg/kg	U	N	Y	U	U							D237-02	16:44
YL0005	E314.0	NONE	N 0 1	PERCHLORATE	.0587	mg/kg	U	N	Y	U	U							D237-01	20:11
YL0006	E314.0	NONE	N 0 1	PERCHLORATE	.0659	mg/kg	U	N	Y	U	U							D237-02	20:28