Northern Agency Tronox Mines

FINAL
Appendix C
Gamma Correlation Report

Response, Assessment, and Evaluation Services (RAES)

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ACRONYMS AND ABBREVIATIONS

µR/hr	Microroentgens per hour
ags	Above ground surface
ASTM	ASTM International
bgs	Below ground surface
CV	Coefficient of variation
cpm	Counts per minute
DQO	Data quality objective
GPS	Global Positioning System
HPIC	High-pressure ionization chamber
Jml	Lower Morrison Formation
Jse	Summerville Entrada Formation
Jste	Undifferentiated Summerville, Todilto, and Entrada Formations
K-40	Potassium-40
MLR	Multiple linear regression
m/s	Meters per second
NaI	Sodium iodide
pCi/g	Picocuries per gram
R^2	Coefficient of determination
Ra-226	Radium-226
RAES	Response, Assessment, and Evaluation Services
RSE	Removal site evaluation
SOP	Standard Operating Procedure
Tetra Tech	Tetra Tech, Inc.
Th-232	Thorium-232
TENORM	Technologically enhanced naturally occurring radioactive material
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

This report conveys results of correlation studies. These correlations are intended to aid efforts to predict radium-226 (Ra-226) soil concentrations and exposure rates from gamma count rates measured during Global Positioning System (GPS)-based gamma radiation (gamma) surveys.

Initially, studies determined the influences of soil concentrations of Ra-226, Thorium-232 (Th-232), and potassium-40 (K-40) on gamma count rates by application of multiple linear regression (MLR) analysis. Only the influence of the Ra-226 concentration was statistically significant in measured gamma count rates.

Mean relationships between gamma count rates and concentrations of Ra-226 in surface soils (0 to 6 inches below ground surface [bgs]) were determined within multiple major geologies and regions. These relationships are described by linear regression models. Coefficients of determination (R^2) of correlations of gamma count rates to Ra-226 soil concentrations ranged from 0.769 to 0.977. Results of the correlation studies are as follows:

- The correlation pertaining to the Lower Morrison Formation (Jml) region had an R^2 of 0.946. The relationship between gamma count rates and Ra-226 soil concentrations was determined by application of a linear regression model:

$$\left({}^{226}Ra\left[picocuries\ per\ gram\left(\frac{pCi}{g}\right)\right]\right) = 0.000596 * (gamma\ count\ rate\ [counts\ per\ minte\ (cpm)]) - 6.0685$$

- Correlations pertaining to the Summerville Entrada Formation (Jse) and Undifferentiated Summerville, Todilto, and Entrada Formations (Jste) geologies were combined and analyzed to represent both of these geologies as one region. The correlation pertaining to this combined region had an R^2 of 0.769. The relationship between gamma count rates and Ra-226 soil concentrations was determined by application of a linear regression model:

$$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000869 * (gamma\ count\ rate\ [cpm]) - 10.904$$

- The correlation pertaining to the Tse Tah region had an R^2 of 0.966. The relationship between gamma count rates and Ra-226 soil concentrations was determined by application of a linear regression model:

$$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.001307 * (gamma\ count\ rate\ [cpm]) - 10.618$$

  Further analysis of the Tse Tah regression indicated a bias because of a single high measurement separated from a cluster of low measurements. Removal of the high measurement resulted in a linear regression model with an R^2 of 0.219. The bias analysis on the regression was performed only for informational purposes and was not used for any subsequent data processing.

- The correlation pertaining to the Group D region had an R^2 of 0.957. The relationship between gamma count rates and Ra-226 soil concentrations was determined by application of a linear regression model:

$$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000413 * (gamma\ count\ rate\ [cpm]) - 2.776$$

- The correlation pertaining to the Group F region had an R^2 of 0.977. The relationship between gamma count rates and Ra-226 soil concentrations was determined by application of a linear regression model:

$$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000596 * (gamma\ count\ rate\ [cpm]) - 4.99$$

- The correlation pertaining to the Group G region had an R^2 of 0.956. The relationship between gamma count rates and Ra-226 soil concentrations was determined by application of a linear regression model:

$$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000737 * (\ gamma\ count\ rate\ [cpm]) - 6.704$$

- The correlation pertaining to the Group H region had an R^2 of 0.804. The relationship between gamma count rates and Ra-226 soil concentrations was determined by application of a linear regression model:

$$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.00080 * (gamma\ count\ rate\ [cpm]) - 13.196$$

- Correlations pertaining to Group I and Group J were combined and analyzed to represent both of these as one region. The region had an R^2 of 0.852. The relationship between gamma count rates and Ra-226 soil concentrations was determined by application of a linear regression model:

$$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000815 * (gamma\ count\ rate\ [cpm]) - 8.463$$

- A project-wide relationship between gamma count rate and exposure rate was also determined and described by application of a linear regression model:

$$Exposure\ rate\ (microroentgens\ per\ hour\ \left[\frac{\mu R}{hr}\right]) = 8.476 + 0.000545 * (gamma\ count\ rate\ [cpm])$$

R^2 of the correlation of exposure rate to gamma count rate was 0.99.

1.0 INTRODUCTION

Gamma count rates depend on a variety of conditions including types of instruments, configuration of instruments (for example, height and angle above ground surface [ags]), soil moisture, and instrument settings. If gamma measurements are not related to a common parameter (such as concentrations of radium-226 [Ra-226] in soil or exposure rates), comparisons of these count rates to data acquired under different conditions or by use of different equipment can be considered erroneous. To avoid this circumstance, two types of correlation studies were completed to establish site-specific and regionally applicable statistical relationships between (1) gamma count rates as measured by a Ludlum 44-10 (or equivalent) and Ra-226 concentrations in surface soil and (2) gamma count rates as measured by a Ludlum 44-10 (or equivalent) and exposure rates measured in a high-pressure ionization chamber (HPIC).

1.1 GAMMA-RADIUM CORRELATION STUDY

The objective of a continuous gamma radiation survey is to characterize the spatial distribution of gamma radiation emitted from surface soils at a site. By use of analytical results for radionuclides and application of correlation methods, those gamma data can then serve to predict radionuclide concentrations in surface soils. The goal of correlation studies is to determine an empirical relationship between gamma radiation and radionuclide concentrations in soil at a site. This relationship then can aid efforts to estimate soil radionuclide concentrations by use of a large amount of gamma radiation data acquired at the site. A strong correlation must exist between the two parameters to achieve accurate estimates of concentrations of gamma-emitting radionuclides in soil at the site.

The purpose of the gamma-radium correlation study is to translate the relatively high-density gamma count rate measurements to more meaningful predicted surface soil concentrations of Ra-226. Predicted surface soil concentrations of Ra-226 are more useful than predicted concentrations of other radionuclides for estimating volumes of technologically enhanced naturally occurring radioactive material (TENORM) that may require removal during future remediation activities.

1.2 GAMMA-EXPOSURE RATE CORRELATION STUDY

In an HPIC, incoming gamma and X-rays are detected by ionization they cause in a detector gas therein. The HPIC collects charges resulting from those ionizations by application of an electric field. Detections of incoming gamma and X-rays occur over a very wide energy range, and the HPIC cannot discriminate specific energies of incoming radiation or even discriminate between gamma rays and X-rays.

The purpose of the study to correlate gamma emission to exposure rate, and to predict energy-independent exposure rate is to translate the relatively high-density gamma count rate measurements to more meaningful energy-independent measures of gamma exposure rate. This translation allows an evaluation of exposure rates across the entire area surveyed for risk assessment purposes. Additionally, the translation also provides a point of comparison if other detectors or detector configurations are employed for gross gamma count rate measurements in the future.

2.0 METHODS

The correlation procedure began with identifications of appropriate correlation study areas as prescribed in Standard Operating Procedure (SOP) 001: Developing a Correlation in Appendix C of the Removal Site Evaluation (RSE) Work Plan (Tetra Tech, Inc. [Tetra Tech] 2018). Although no data quality objective (DQO) was established for homogeneity of the plots, a coefficienct of variation (CV) of less than 0.2 was maintained for all plots selected during the desktop study. Plots selected in the field were surveyed and evaluated qualitatively and quantitatively using data collection software capable of displaying count rate ranges in real time. The ideal correlation study area is an area no larger than a 10- by 10-meter plot within which gamma measurements are similar. Plots were chosen in areas relatively level and away from large objects or walls that could enhance shine. Correlation plots were chosen as a group to include a wide range of gross gamma counts to encompass the gamma ranges expected in the survey. Because of terrain or limited areas of homogenous counts at some gamma count ranges, the size of many correlation plots deviated from the prescribed 10 by 10 meters. Where possible, correlation plots were grouped into major geologies and Groups (as defined in the RSE Work Plan). Descriptions of major geologic units used as bases for grouping correlation plot data pairs are in Appendix A of the RSE Radiological and Chemical Background Investigation Report. Geologies or groups within which numbers of measurements were insufficient (generally less than 10) were grouped with similar geologies or adjacent groups when necessary. Group I, for example, included only four correlation plots. Because of proximities of Group I and Group J to the southern face of the Lukachukai mountains, Groups I and J were combined to establish a Group I & J correlation including 10 plots. Similarily, a regional correlation was developed for the Tse Tah region (Groups A and B).

At each plot, a Global Positioning System (GPS)-based gamma radiation survey occurred. The gamma radiation surveys conducted within the RSE survey boundaries were performed using a 2-meter transect spacing. Within the correlation plots, however, the gamma radiation survey transect spacing was reduced from 2 meters to no more than 1 meter to provide high-density gamma measurements within the correlation plot. The detector height was maintained at 1 meter ags. Scanning speed was maintained at less than 0.5 meters per second (m/s), and the plot was surveyed as homogenously as possible to minimize spatial bias therein. When possible, the same meter and detector pair was used for the correlations to maintain consistency in detector response among plots. If multiple detector and meter pairs were used for the correlation, to ensure responses within 20 percent of the expected mean, daily function checks were conducted to maintain consistency among the various detector and meter pairs.

Grid based, nine-point composite samples of surface soil (0 to 6 inches below ground surface [bgs]) were collected and homogenized into a single sample for field laboratory analysis. Sample locations in irregularily shaped correlation plots were distributed evenly across the area of the plot. Soil samples were analyzed by ALS Environmental in Ft Collins, Colorado, for Ra-226, thorium-232 (Th-232), and potassium-40 (K-40) via United States Environmental Protection Agency (USEPA) Method 901.1.

Investigation of influences of Th-232, K-40, and Ra-226 on gamma count rates proceeded by application of multiple linear regression (MLR). This technique explores how multiple independent variables relate to one dependant variable. In this case, the measured gamma count

rate is the dependent variable, whereas concentrations of gamma-emitting radionuclides are the independent variables. Statistical software (JMP, version 14.1.0) was used to perform this analysis. Evaluation of whether Th-232 and K-40 were statistically significant predictors of gamma count rate occurred by use of p-values of MLR results. A standard alpha p-value level of 0.05 was designated as the cutoff for the statistical test. If the p-value of the MLR was less than 0.05, the radionuclide was considered significant to the regression. If the p-value of the MLR exceeded 0.05, the radionuclide was considered insignificant and was excluded from the final regression.

Each reported regression was evaluated for statistical outliers. Steps taken for evaluation of outliers were as follows:

1. A visual inspection of the regressionto identify points lying well outside the general pattern exhibited by the regression.
2. After visual inspection for outliers, a T-statistic test and Dixon test (ASTM International [ASTM] 2008) were performed on suspected graphical outliers to determine if these data pairs were statistical outliers. The coefficient of determination (R^2) for the model was used as a basic measure of validity of the correlation, with a data quality objective of an R^2 of 0.80 or greater.
3. If a point was a statistical outlier based on both the T-statistics and Dixon test, the point was removed from the group, and the regression was rerun.

For the exposure-rate correlation, an HPIC (GE Reuter-Stokes RSDetection, RS-S131-200) was used to take energy-independent measurements of exposure rates in accordance with SOP 003: Making Exposure Rate Measurements Using a HPIC (in Appendix C of the RSE Work Plan) (Tetra Tech 2018). At each measurement location, gamma exposure rate measurements occurred at 1-minute integrated intervals over a duration of at least 10 minutes. The HPIC gamma exposure rate representing a grid is the average of the 1-minute integrated measurements, excluding the first minute of data acquisition during which the HPIC exhibits a startup pulse. The HPIC was centered within the correlation plot area at 1 meter ags. Additionally, a 1-minute static count occurred at the same location by use of a sodium iodide (NaI) detection system. Height of the NaI detector was maintained at 1 meter ags. A linear regression occurred on data pairs of exposure rate and gamma count rate. A single, project-wide correlation was determined.

3.0 RESULTS

This section conveys correlations achieved for the various geological regions and groups involved in the investigation.

3.1 JML GEOLOGY CORRELATION

Field personnel took GPS-based gamma count rate measurements and collected nine-point composite samples of surface soils in 27correlation plots within the Lower Morrison Formation (Jml) geology from May 9 to August 21, 2018. The plots were distributed across mine sites, target sites, and background sites to achieve a representative distribution of detected concentrations of gamma-emitting radionuclides in surface soils and gamma count rate measurements. These areas were selected according to criteria established in the RSE Work Plan (Tetra Tech 2018). Jml correlation plot locations and gamma scan data appear in Attachment C1. Table C-1 lists serial numbers of detectors and meters, and their dates of use.

The Tetra Tech IDs of sites containing Jml correlation plots are as follows:

- B27
- M3
- M4
- M5
- M6
- M7
- M8
- M15
- M16
- M18
- M20
- M21
- M30
- M32
- T18
- T23

Table C-1. Detector and Meter Serial Numbers and Dates of Use for Jml Geology Correlation Measurements

Ludlum Model 44-10[1]	Ludlum Model 2221 Ratemeter/Scaler[1]	Dates Used
PR303716	149940	5/9/2018
		5/10/2018
		6/4/2018
		6/5/2018
		6/18/2018
		6/19/2018
PR355781	271424	8/21/2018

Note:
[1] Serial numbers for radiation instrument used.

A total of 9,662 gamma measurements across 27 correlation plots, ranging from 6,566 to 179,425 counts per minute (cpm) were collected. Ra-226 soil concentrations within the correlation plots ranged from 0.42 to 49.3 picocuries per gram (pCi/g). Dixon Q and T-statistics

tests for outliers indicated one outlier, which was not included in the regression analysis. The final dataset used in development of the Jml correlation included 26 correlation plots

An MLR was used to evaluate the influence of Th-232 and K-40 on average gamma count rate at the correlation locations. The MLR model was first run using Ra-226, Th-232, and K-40 as predictors of gamma count rate. Results indicated that Th-232 and K-40 were not significant predictors of gamma count rate (p-values of 0.466 and 0.939, respectively), while Ra-226 was significant (p-value < 0.0001). The MLR model was subsequently run without K-40. In this second model run, the p-value for Ra-226 was significant ($p < 0.0001$), while that for Th-232 was not ($p = 0.350$), implying no need to account for Th-232 when predicting concentrations of Ra-226 from gamma survey data. Finally, K-40 and Ra-226 were modelled together. In this third model run, the p-value for Ra-226 was significant ($p < 0.0001$), while that for K-40 was not ($p = 0.570$), implying no need to account for K-40 when predicting concentrations of Ra-226 from gamma survey data. Therefore, results indicate Th-232 and K-40 concentrations in soil are not significant predictors of gamma count rate. Finally, the p-value for Ra-226 as a predictor of gamma count rate was significant ($p < 0.0001$), as described above, and the R^2 value (0.946) exceeded the applicable project DQO ($R^2 > 0.8$). MLR results are presented in Attachment C3.

Regression results appear on Figure C-1, and regression equations (1a and 1b) follow.

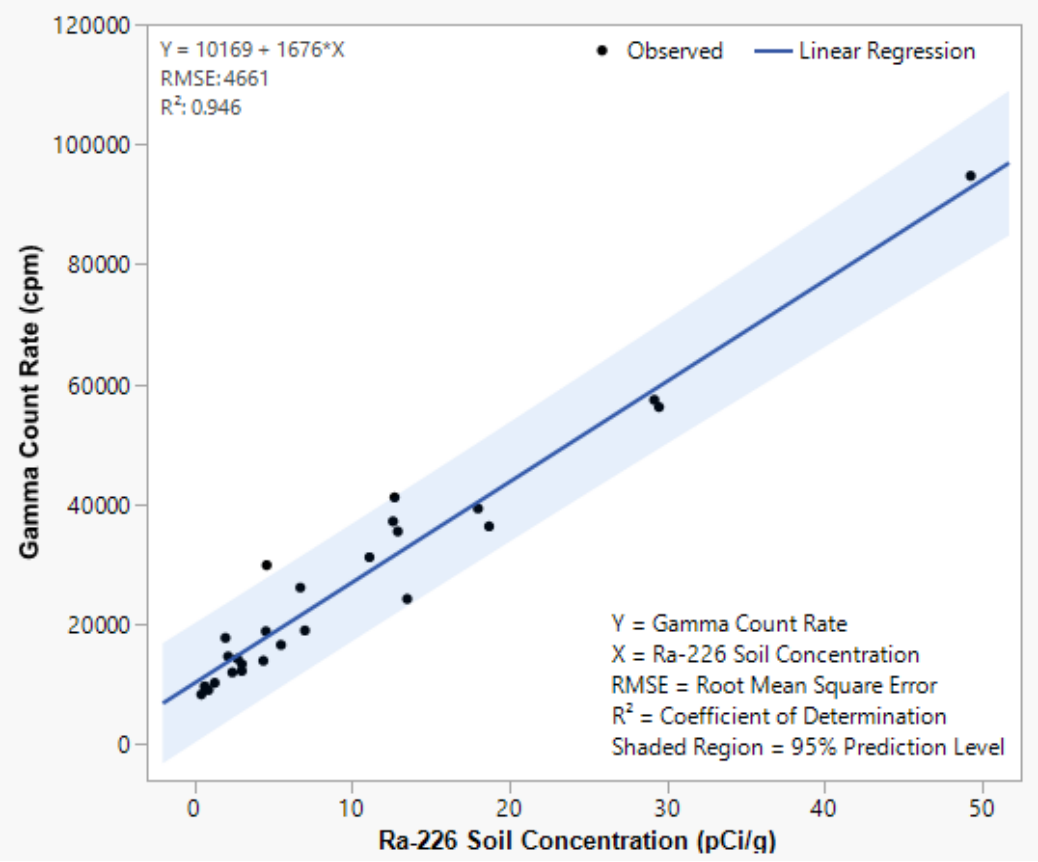


Figure C-1. Correlation of Gamma Count Rates and Concentrations of Radium-226 in Surface Soils (Blue Line) with 95% Prediction Level Bands for the Predicted Values (Shaded Region) Plotted for Jml Geology

Equation 1a: $$\gamma(cpm) = 10{,}169 + 1675.7\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right)$$

Equation 1b: $$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000596\left(\gamma(cpm)\right) - 6.0685$$

3.2 JSE & JSTE GEOLOGY CORRELATION

Field personnel took GPS-based gamma count rates measurements and collected nine-point composite samples of surface soils in 17 correlation plots within the Summerville Entrada Formation (Jse) geology region, and in four plots within the Undifferentiated Summerville, Todilto, and Entrada Formations (Jste) region from June 4 to September 26, 2018. The plots were distributed across mine sites and a background site to achieve a representative distribution of detected concentrations of gamma-emitting radionuclides in surface soils and gamma count rate measurements. These areas were selected according to criteria established in the RSE Work Plan (Tetra Tech 2018). Jse & Jste correlation plot locations and gamma scan data are shown in Attachment C1. Table C-2 lists serial numbers of detectors and meters, with their dates of use.

Tetra Tech IDs of sites containing Jse & Jste correlation plots are the following:

- B32
- M17
- M19
- M20
- M21
- M22
- M27
- M33
- M34
- M37

Table C-2. Detector and Meter Serial Numbers and Dates of Use for Jse and Jste Geology Correlation Measurements

Ludlum Model 44-10[1]	Ludlum Model 2221 Ratemeter/Scaler[1]	Dates Used
PR303716	149940	6/4/2018
		6/5/2018
		6/18/2018
		6/19/2018
		9/25/2018
		9/26/2018
PR355781	271424	8/20/2018

Note:
[1] Serial numbers for radiation instrument used.

A total of 9,076 gamma measurements occurred across the 21 correlation plots, ranging from 6,376 to 51,055 cpm. Detected Ra-226 soil concentrations within the correlation plots ranged from 0.59 to 23.4 pCi/g. Dixon Q and T-statistics tests for outliers indicated one outlier, which was not considered in the regression analysis.

An MLR was used to evaluate influences of Th-232 and K-40 on the average gamma count rate at the correlation locations. The MLR model was first run using Ra-226, Th-232, and K-40 as predictors of gamma count rate. Results indicated that Th-232 and K-40 were not significant predictors of the gamma count rate (p-values of 0.281 and 0.506, respectively), while Ra-226 was significant (p-value < 0.0001). The MLR model was subsequently run without K-40. In this second model run, the p-value for Ra-226 was significant ($p < 0.0001$), while that for Th-232 was not ($p = 0.368$), implying no need to account for Th-232 when predicting concentrations of Ra-226 from gamma survey data. Finally, K-40 and Ra-226 were modelled together. In this third model run, the p-value for Ra-226 was significant ($p < 0.0001$), while that for K-40 was not ($p = 0.840$), implying no need to account for K-40 when predicting concentrations of Ra-226 from gamma survey data. Therefore, results indicate Th-232 and K-40 concentrations in soil are not significant predictors of gamma count rate. Finally, although the p-value for Ra-226 as a predictor of gamma count rate was significant ($p < 0.0001$), as described above, R^2 was less than the applicable DQO. This notwithstanding, the p-value parameter indicated a predictive relationship between Ra-226 concentrations and gamma count rate. All MLR results are shown in Attachment C3.

Regression results are shown on Figure C-2, and regression equations (2a and 2b) follow.

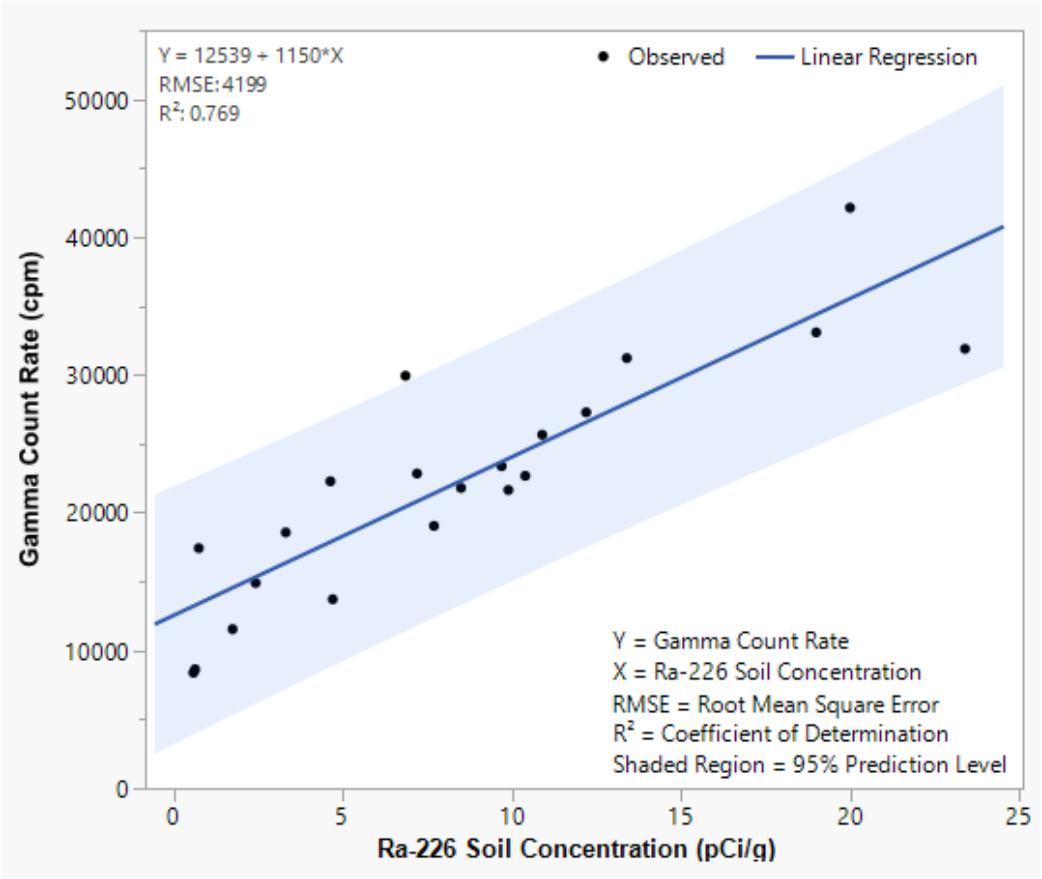


Figure C-2. Correlation of Gamma Count Rates and Concentrations of Radium-226 in Surface Soils (Blue Line) with 95% Prediction Level Bands for the Predicted Values (Shaded Region) Plotted for Jse and Jste Geology

Equation 2a: $$\gamma(cpm) = 12{,}539 + 1{,}150\left(^{226}Ra\left[\frac{pCi}{g}\right]\right)$$

Equation 2b: $$\left(^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000869\left(\gamma(cpm)\right) - 10.904$$

3.3 TSE TAH REGION CORRELATION

Field personnel measured GPS-based gamma count rates and collected nine-point composite samples of surface soils in nine correlation plots within the Group A and B regions (five in Group A and four in Group B) on August 19, 2018. The plots were distributed across mine sites, target sites, and background sites to achieve a representative distribution of concentrations of gamma-emitting radionuclides in surface soils and gamma count rate measurements. These areas were selected according to criteria established in the RSE Work Plan (Tetra Tech 2018). Group A and B correlation plot locations and gamma count rate measurements are shown in Attachment C1. Table C-3 lists serial numbers of detectors and meters, with their dates of use.

Tetra Tech IDs for sites containing Tse Tah region correlation plots are the following:

- B4
- T1
- T4
- T7
- M1
- M2

Table C-3. Detector and Meter Serial Numbers and Dates of Use for Tse Tah Region Correlation Measurements

Ludlum Model 44-10[1]	Ludlum Model 2221 Ratemeter/Scaler[1]	Dates Used
PR355781	271424	8/19/2018

Note:
[1] Serial numbers for radiation instrument used.

A total of 3,323 gamma measurements occurred across the nine correlation plots ranging from 6,186 to 52,741 cpm. Detected Ra-226 soil concentrations within the correlation plots ranged from 0.56 to 41 pCi/g. Dixon Q and T-statistics tests for outliers indicated one outlier, which was not considered in the regression analysis. An additional measurement was removed because of a nondetect qualifier reported by the laboratory.

An MLR was used to evaluate influences of Ra-226, Th-232 and K-40 on average gamma count rate at correlation locations. The MLR model was first run using Ra-226, Th-232, and K-40 as predictors of gamma count rate. Results indicated that Th-232 and K-40 were not significant predictors of gamma count rate (p-values of 0.161 and 0.188, respectively), while Ra-226 was significant (p-value = 0.002). The MLR model was subsequently run without K-40. In this second model run, the p-value for Ra-226 was significant (p = 0.0002), while that for Th-232 was not (p = 0.264), implying no need to account for Th-232 when predicting concentrations of Ra-226 from gamma survey data. Finally, K-40 and Ra-226 were modelled together. In this third model run, the p-value for Ra-226 was significant (p = 0.0018), while that for K-40 was not (p = 0.214),

implying no need to account for K-40 when predicting concentrations of Ra-226 from gamma survey data. The results indicate Th-232 and K-40 concentrations in soil are not significant predictors of gamma count rates. Finally, the p-value for Ra-226 as a predictor of gamma count rate was significant (p = 0.0001), as described above, and the R^2 value (0.966) exceeded the applicable project DQO ($R^2 > 0.8$). All MLR results are shown in Attachment C3.

Regression results are shown on Figure C-3, and regression equations (3a and 3b) follow.

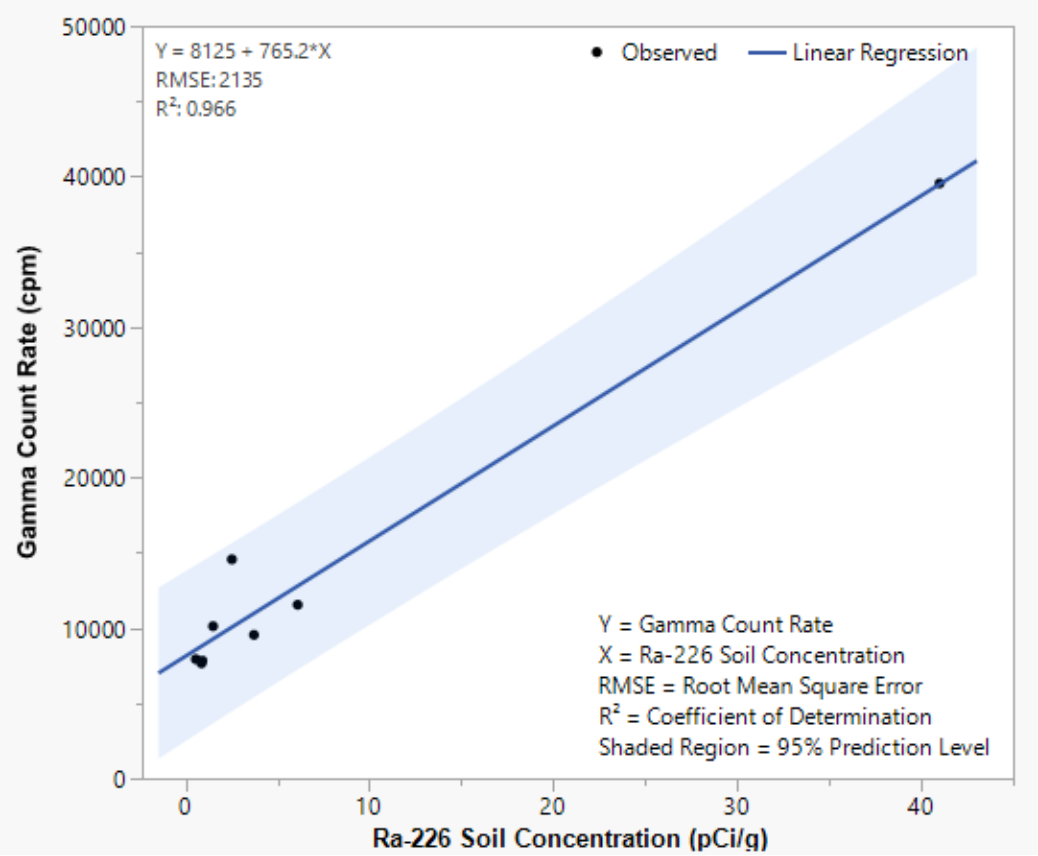


Figure C-3. Correlation of Gamma Count Rates and Concentrations of Radium-226 in Surface Soils (Blue Line) with 95% Prediction Level Bands for the Predicted Values (Shaded Region) Plotted for the Tse Tah Region

Equation 3a: $$\gamma(cpm) = 8{,}125 + 765.2\left(^{226}Ra\left[\frac{pCi}{g}\right]\right)$$

Equation 3b: $$\left(^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.001307\big(\gamma(cpm)\big) - 10.618$$

Visual observation of the Tse Tah region regression indicates a high measurement and a cluster of low measurements that emulates a 2-point correlation. This bias was confirmed by removal of the maximum measurement and a rerun of the regression, as shown on Figure C-4. The regression indicates a very low R^2 of 0.219 and wide prediction intervals. The poor regression is likely because of a shortage of mid-to-high level radiologically impacted areas in the Tse Tah region, resulting in a cluster of measurements around background levels. Because of the bias

associated with the Tse Tah region correlation, caution is advised in use of the regression. Regression equations (4a and 4b) follow Figure C-4. Results indicated a similar slope between the regressions, with and without exclusion of the maximum measurement.

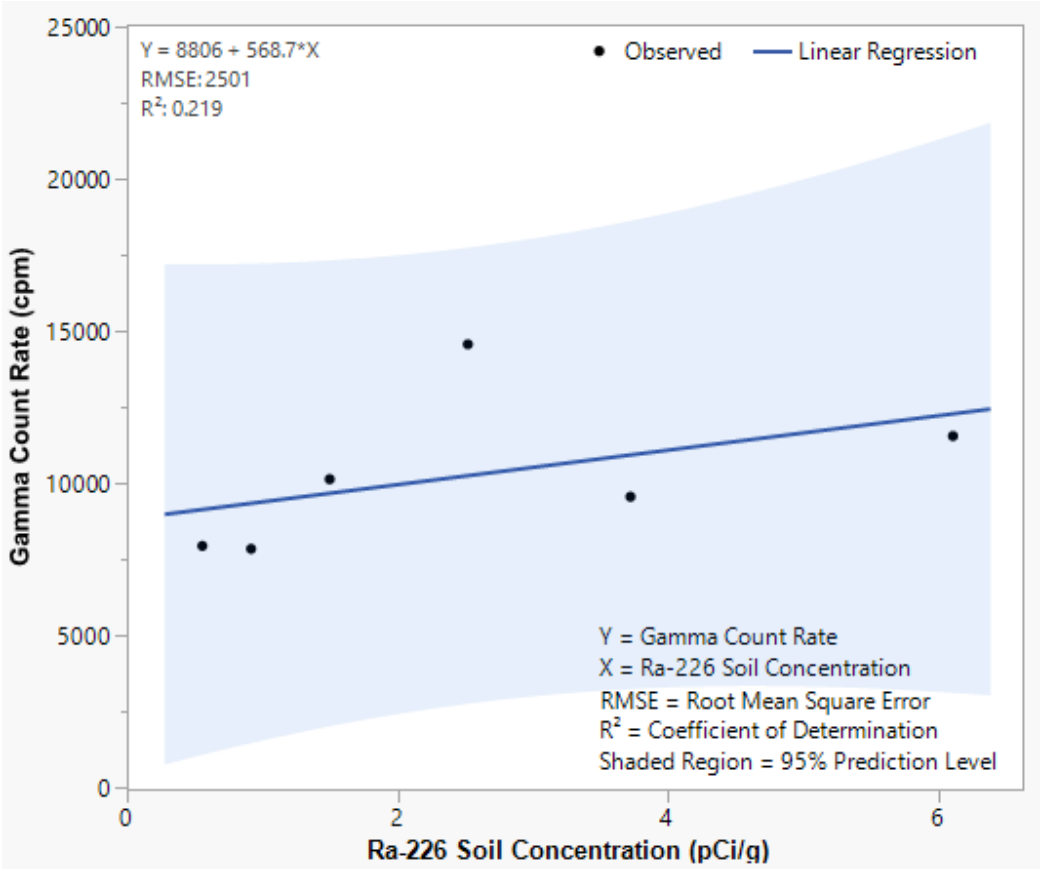


Figure C-4. Correlation of Gamma Count Rates And Concentrations of Radium-226 in Surface Soils (Blue Line) with 95% Prediction Level Bands for the Predicted Values (Shaded Region) Plotted for the Tse Tah Region with the Maximum Measurement Excluded

Equation 4a: $$\gamma(cpm) = 8{,}806 + 568.7\left(^{226}Ra\left[\frac{pCi}{g}\right]\right)$$

Equation 4b: $$\left(^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.001758\big(\gamma(cpm)\big) - 15.48$$

3.4 GROUP D CORRELATION

Field personnel measured GPS-based gamma count rates and collected nine-point composite samples of surface soils in 12 correlation plots within the Group D region on May 9 and 10, 2018. The plots were distributed across many different mine sites and target sites to achieve a representative distribution of detected Ra-226 concentrations and gamma measurements. These areas were selected according to criteria established in the RSE Work Plan (Tetra Tech 2018). Group D correlation plot locations and gamma scan data are shown in Attachment C1. Table C-4 lists serial numbers of detectors and meters, with their dates of use.

Tetra Tech IDs for sites containing Group D correlation plots are the following:

- M3
- M4
- M5
- M6
- M7
- M8
- T17

Table C-4. Detector and Meter Serial Numbers and Dates of Use for Group D Correlation Measurements

Ludlum Model 44-10[1]	Ludlum Model 2221 Ratemeter/Scaler[1]	Dates Used
PR303716	149940	5/9/2018
		5/10/2018

Note:
[1] Serial numbers for radiation instrument used.

A total of 1,537 gamma measurements occurred across the 12 correlation plots, ranging from 7,363 to 65,583 cpm. Detected Ra-226 soil concentrations in the correlation plots ranged from 0.38 to 12.9 pCi/g. Dixon Q and T-statistics tests for outliers indicated one outlier, which was not considered in the regression analysis.

An MLR was used to evaluate influences of Th-232 and K-40 on the average gamma count rate at correlation locations. The MLR model was first run using Ra-226, Th-232, and K-40 as predictors of gamma count rate. Results indicated that Th-232 and K-40 were not significant predictors of gamma count rate (p-values of 0.121 and 0.279, respectively), while influence of Ra-226 was significant (p-value < 0.0001). The MLR model was subsequently run without K-40. In this second model run, the p-value for Ra-226 was significant ($p < 0.0001$), while that for Th-232 was not ($p = 0.219$), implying no need to account for Th-232 when predicting concentrations of Ra-226 from gamma survey data. Finally, K-40 and Ra-226 were modelled together. In this third model run, the p-value for Ra-226 was significant ($p < 0.0001$), while that for K-40 was not ($p = 0.765$), implying no need to account for K-40 when predicting concentrations of Ra-226 from gamma survey data. The results described above indicate Th-232 and K-40 concentrations in soil are not significant predictors of gamma count rate. The p-value for Ra-226 as a predictor of gamma count rate was significant ($p < 0.0001$), as described above, and the R^2 value (0.957) exceeded the applicable project DQO ($R^2 > 0.8$). All MLR results are shown in Attachment C3.

Regression results are shown on Figure C-5, and regression equations (5a and 5b) follow.

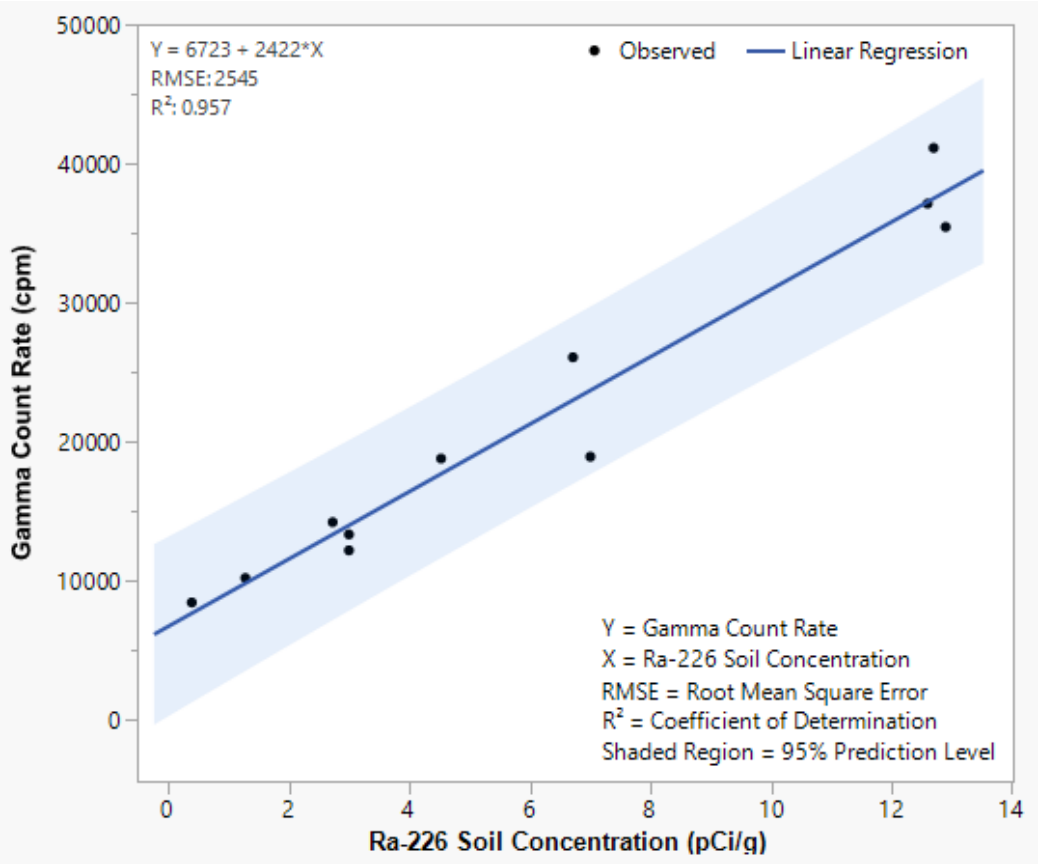


Figure C-5. Correlation of Gamma Count Rates and Concentrations of Radium-226 in Surface Soils (Blue Line) with 95% Prediction Level Bands for the Predicted Values (Shaded Region) Plotted for the Group D Region

Equation 5a: $$\gamma(cpm) = 6{,}723 + 2{,}422\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right)$$

Equation 5b: $$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000413\left(\gamma(cpm)\right) - 2.776$$

3.5 GROUP F CORRELATION

Field personnel measured GPS-based gamma count rates and collected nine-point composite samples of surface soils in 11 correlation plots within the Group F region on June 4 and 5, 2018. The plots were distributed across many different mine sites and a target site to achieve a representative distribution of detected Ra-226 concentrations and gamma measurements. These areas were selected according to criteria established in the RSE Work Plan (Tetra Tech 2018). Group F correlation plot locations and gamma scan data are shown in Attachment C1. Table C-5 lists serial numbers of detectors and meters, with their dates of use.

Tetra Tech IDs for sites containing Group F correlation plots are the following:

- M15
- M16
- M17
- M18
- M19
- T23

Table C-5. Detector and Meter Serial Numbers and Dates of Use for Group F Correlation Measurements

Ludlum Model 44-10[1]	Ludlum Model 2221 Ratemeter/Scaler[1]	Dates Used
PR303716	149940	6/4/2018
		6/5/2018

Note:
[1] Serial numbers for radiation instrument used.

A total of 5,490 gamma measurements occurred across the 11 correlation plots, ranging from 7,317 to 179,425 cpm. Detected Ra-226 soil concentrations within the correlation plots ranged from 0.75 to 49.3 pCi/g. No correlation plots within this group were determined to be outliers.

An MLR was used to evaluate influences of Ra-226, Th-232, and K-40 on average gamma count rate at the correlation locations. The MLR model was first run using Ra-226, Th-232, and K-40 as predictors of gamma count rate. Results indicated that Th-232 and K-40 were not significant predictors of the gamma count rate (p-values of 0.309 and 0.889, respectively), while Ra-226 was significant (p-value < 0.0001). The MLR model was subsequently run without K-40. In this second model run, the p-value for Ra-226 was significant ($p < 0.0001$), while that for Th-232 was not ($p = 0.938$), implying no need to account for Th-232 when predicting concentrations of Ra-226 from gamma survey data. Finally, K-40 and Ra-226 were modelled together. In this third model run, the p-value for Ra-226 was significant ($p < 0.0001$), while that for K-40 was not ($p = 0.278$), implying no need to account for K-40 when predicting concentrations of Ra-226 from gamma survey data. The results described above indicate Th-232 and K-40 concentrations in soil are not significant predictors of gamma count rate. The p-value for Ra-226 as a predictor of gamma count rate was significant ($p < 0.0001$), as described above, and the R^2 value (0.977) exceeded the applicable project DQO ($R^2 > 0.8$). All MLR results are shown in Attachment C3.

Regression results are shown on Figure C-6, and regression equations (6a and 6b) follow.

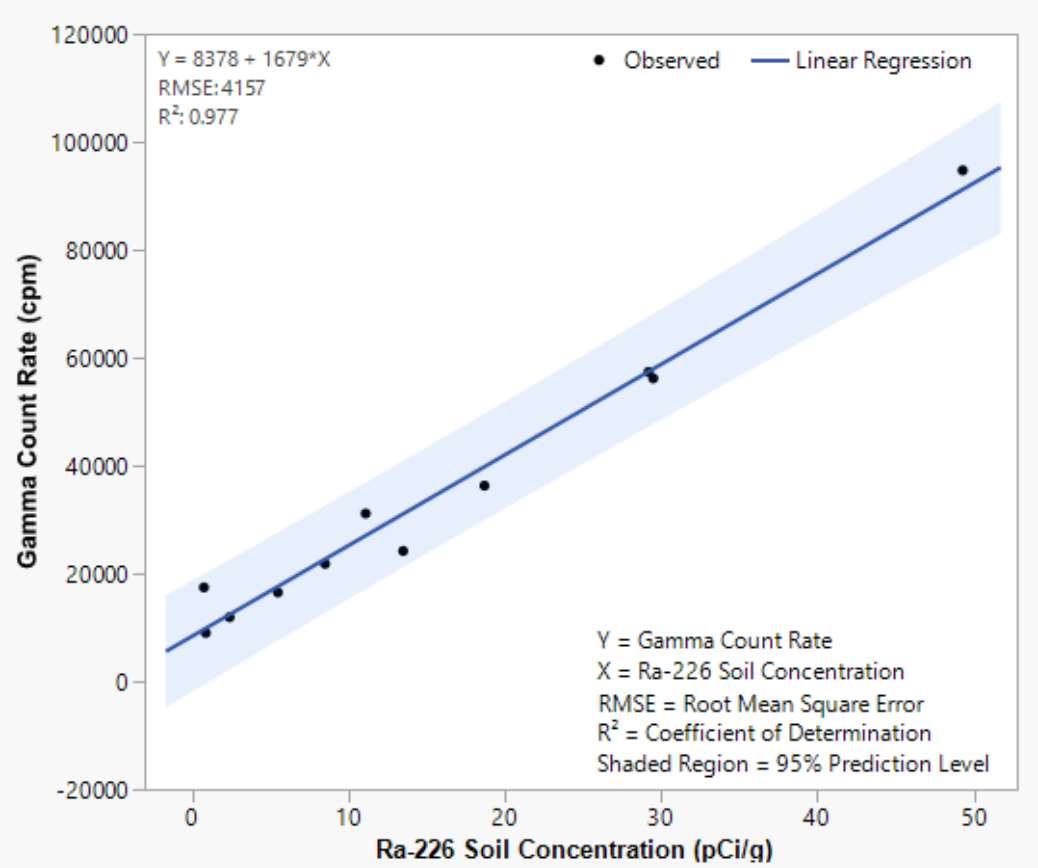


Figure C-6. Correlation of Gamma Count Rates and Concentrations of Radium-226 in Surface Soils (Blue Line) with 95% Prediction Level Bands for the Predicted Values (Shaded Region) Plotted for the Group F Region

Equation 6a: $$\gamma(cpm) = 8{,}378 + 1679\left(^{226}Ra\left[\frac{pCi}{g}\right]\right)$$

Equation 6b: $$\left(^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000596\left(\gamma(cpm)\right) - 4.99$$

3.6 GROUP G CORRELATION

Field personnel measured GPS-based gamma count rates and collected nine-point composite samples of surface soils in 10 correlation plots within the Group G region on June 18 and 19, 2018. The plots were distributed across many different mine sites and a background site to achieve a representative distribution of detected Ra-226 concentrations and gamma measurements. These areas were selected according to criteria established in the RSE Work Plan (Tetra Tech 2018). Group G correlation plot locations and gamma scan data are shown in Attachment C1. Table C-6 lists serial numbers of detectors and meters, with their dates of use.

Tetra Tech IDs for sites containing Group G correlation plots are the following:

- M20
- M21
- M22
- B27

Table C-6. Detector and Meter Serial Numbers and Dates of Use for Group G Correlation Measurements

Ludlum Model 44-10[1]	Ludlum Model 2221 Ratemeter/Scaler[1]	Dates Used
PR303716	149940	6/18/2018
		6/19/2018

Note:
[1] Serial numbers for radiation instrument used.

A total of 5,513 gamma measurements occurred across the 10 correlation plots, ranging from 6,566 to 51,055 cpm. Detected Ra-226 soil concentrations within the correlation plots ranged from 0.42 to 19.0 pCi/g. Dixon Q and T-statistics tests for outliers indicated one outlier, which was not considered in the regression analysis.

An MLR was used to evaluate influences of Th-232 and K-40 on average gamma count rate at correlation locations. The MLR model was first run using Ra-226, Th-232, and K-40 as predictors of gamma count rate. Results indicated that Th-232 and K-40 were not significant predictors of the gamma count rate (p-values of 0.509 and 0.748, respectively) while Ra-226 was significant (p-value = 0.00015). The MLR model was subsequently run without K-40. In this second model run, the p-value for Ra-226 was significant (p = 0.00002), while that for Th-232 was not (p = 0.523), implying no need to account for Th-232 when predicting concentrations of Ra-226 from gamma survey data. Finally, K-40 and Ra-226 were modelled together. In this third model run, the p-value for Ra-226 was significant (p = 0.00003), while that for K-40 was not (p = 0.957), implying no need to account for K-40 when predicting concentrations of Ra-226 from gamma survey data. The results described above indicate Th-232 and K-40 concentrations in soil are not significant predictors of gamma count rate. The p-value for Ra-226 as a predictor of gamma count rate was significant (p = 0.00001), as described above, and the R^2 value (0.956) exceeded the applicable project DQO ($R^2 > 0.8$). All MLR results appear in Attachment C3.

Regression results are shown on Figure C-7, and regression equations (7a and 7b) follow.

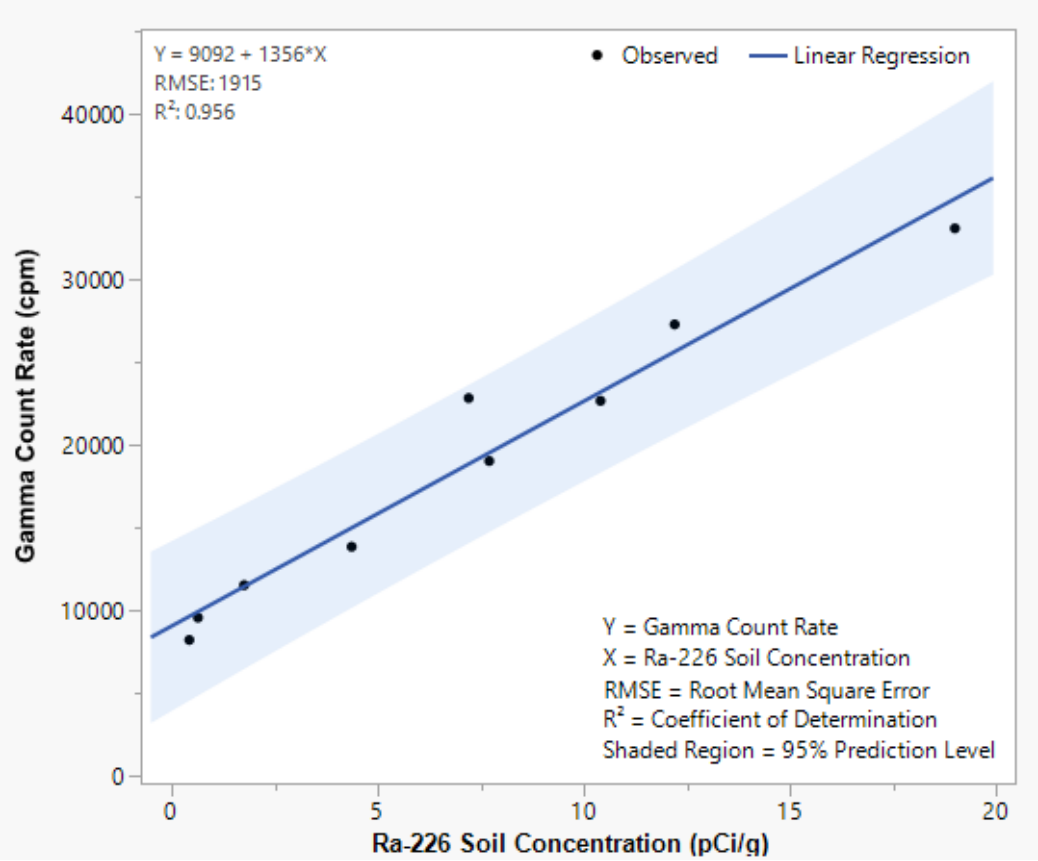


Figure C-7. Correlation of Gamma Count Rates and Concentrations of Radium-226 in Surface Soils (Blue Line) with 95% Prediction Level Bands for the Predicted Values (Shaded Region) Plotted for the Group G Region

Equation 7a: $$\gamma(cpm) = 9{,}092 + 1{,}356.3\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right)$$

Equation 7b: $$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000737\left(\gamma(cpm)\right) - 6.704$$

3.7 GROUP H CORRELATION

Field personnel measured GPS-based gamma count rates and collected nine-point composite samples of surface soils in six correlation plots within the Group H region on August 21 and September 25, 2018. The plots were distributed across different mine sites to achieve a representative distribution of Ra-226 concentrations and gamma measurements. These areas were selected according to criteria established in the RSE Work Plan (Tetra Tech 2018). Group H correlation plot locations and gamma scan data are shown in Attachment C1. Table C-7 lists serial numbers of detectors and meters, with their dates of use.

Tetra Tech IDs for sites containing Group H correlation plots are the following:

- M27
- M30
- M32

Table C-7. Detector and Meter Serial Numbers and Dates of Use for Group H Correlation Measurements

Ludlum Model 44-10[1]	Ludlum Model 2221 Ratemeter/Scaler[1]	Dates Used
PR355781	271424	8/21/2018
PR303716	149940	9/25/2018

Note:
[1] Serial numbers for radiation instrument used.

A total of 2,679 gamma measurements across the six correlation plots ranged from 12,375 to 47,499 cpm. Detected Ra-226 concentrations ranged from 1.95 to 18.0 pCi/g. No correlation plots within this group were determined to be outliers.

An MLR was used to evaluate influences of Ra-226, Th-232, and K-40 on average gamma count rate at the correlation locations. The MLR model was first run using Ra-226, Th-232, and K-40 as predictors of gamma count rate. Results indicated that Th-232 and K-40 were not significant predictors of the gamma count rate (p-values of 0.518 and 0.897, respectively) while the Ra-226 was also not significant in this model (p-value = 0.09). The MLR model was subsequently run without K-40. In this second model run, the p-value for Ra-226 was significant ($p = 0.047$), while that for Th-232 was not ($p = 0.854$), implying no need to account for Th-232 when predicting concentrations of Ra-226 from gamma survey data. Finally, K-40 and Ra-226 were modelled together. In this the third model run, the p-value for Ra-226 was significant ($p = 0.0269$), while that for K-40 was not ($p = 0.409$), implying no need to account for K-40 when predicting concentrations of Ra-226 from gamma survey data. The results described above indicate Th-232 and K-40 concentrations in soil are not significant predictors of gamma count rate. The p-value for Ra-226 as a predictor of gamma count rate was significant ($p = 0.0155$), as described above, and the R^2 value (0.804) was less than the applicable project DQO ($R^2 > 0.8$). All MLR results appear in Attachment C3.

Regression results are shown on Figure C-8, and regression equations (8a and 8b) follow.

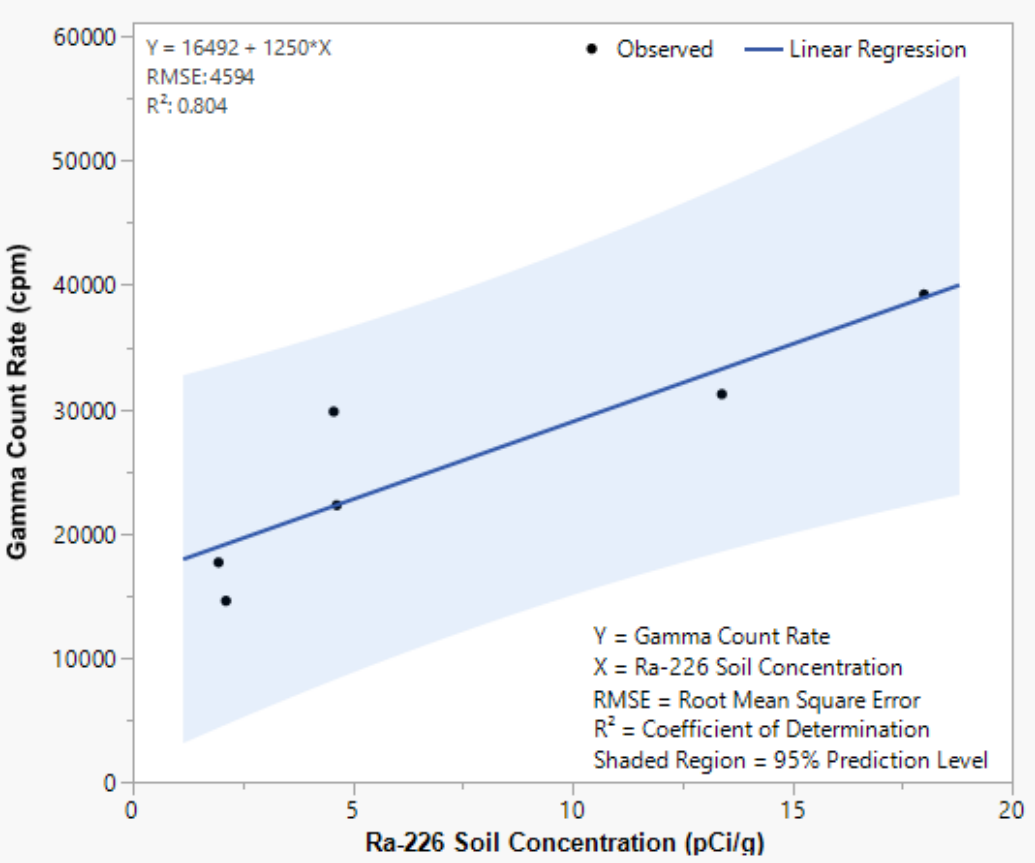


Figure C-8. Correlation of Gamma Count Rates and Concentrations of Radium-226 in Surface Soils (Blue Line) with 95% Prediction Level Bands for the Predicted Values (Shaded Region) Plotted for the Group H Region

Equation 8a: $$\gamma(cpm) = 16{,}492 + 1249.8\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right)$$

Equation 8b: $$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.00080\left(\gamma(cpm)\right) - 13.196$$

3.8 GROUP I & J CORRELATION

Field personnel measured GPS-based gamma count rates and collected nine-point composite samples of surface soils in 10 correlation plots within the Group I & J region (four in Group I and six in Group J) on August 20 and September 26, 2018. Sample plot locations were distributed across many different mine sites and a background site to achieve a representative distribution of detected Ra-226 concentrations and gamma measurements. These areas were selected according to criteria established in the RSE Work Plan (Tetra Tech 2018). Group I & J correlation plot locations and gamma scan data are shown in Attachment C1. Table C-8 lists serial numbers of detectors and meters, with their dates of use.

Tetra Tech IDs for sites containing Group I & J correlation plots are the following:

- M33
- M34
- M37
- B32

Table C-8. Detector and Meter Serial Numbers and Dates of Use for Group I & J Correlation Measurements

Ludlum Model 44-10[1]	Ludlum Model 2221 Ratemeter/Scaler[1]	Dates Used
PR355781	271424	8/20/2018
PR303716	149940	9/26/2018

Note:
[1] Serial numbers for radiation instrument used.

A total of 1,918 gamma measurements occurred across the 10 correlation plots, ranging from 6,376 to 46,632 cpm. Detected Ra-226 concentrations ranged from 0.59 to 23.4 pCi/g. No correlation plots within this group were determined to be outliers.

An MLR was used to evaluate influences of Ra-226, Th-232, and K-40 on average gamma count rate at the correlation locations. The MLR model was first run using Ra-226, Th-232, and K-40 as predictors of gamma count rate. Results indicated that Th-232 and K-40 were not significant predictors of the gamma count rate (p-values of 0.631 and 0.650, respectively), while Ra-226 was significant (p-value = 0.0047). The MLR model was subsequently run without K-40. In this second model run, the p-value for Ra-226 was significant (p = 0.0023), while that for Th-232 was not (p = 0.723), implying no need to account for Th-232 when predicting concentrations of Ra-226 from gamma survey data. Finally, K-40 and Ra-226 were modelled together. In this third model run, the p-value for Ra-226 was significant (p = 0.0009), while that for K-40 was not (p = 0.853), implying no need to account for K-40 when predicting concentrations of Ra-226 from gamma survey data. The results described above indicate Th-232 and K-40 concentrations in soil are not significant predictors of gamma count rate. The p-value for Ra-226 as a predictor of gamma count rate was significant (p = 0.00014), as described above, and the R^2 value (0.852) exceeded the applicable project DQO ($R^2 > 0.8$). All MLR results appear in Attachment C3.

Regression results are shown on Figure C-9, and regression equations (9a and 9b) follow.

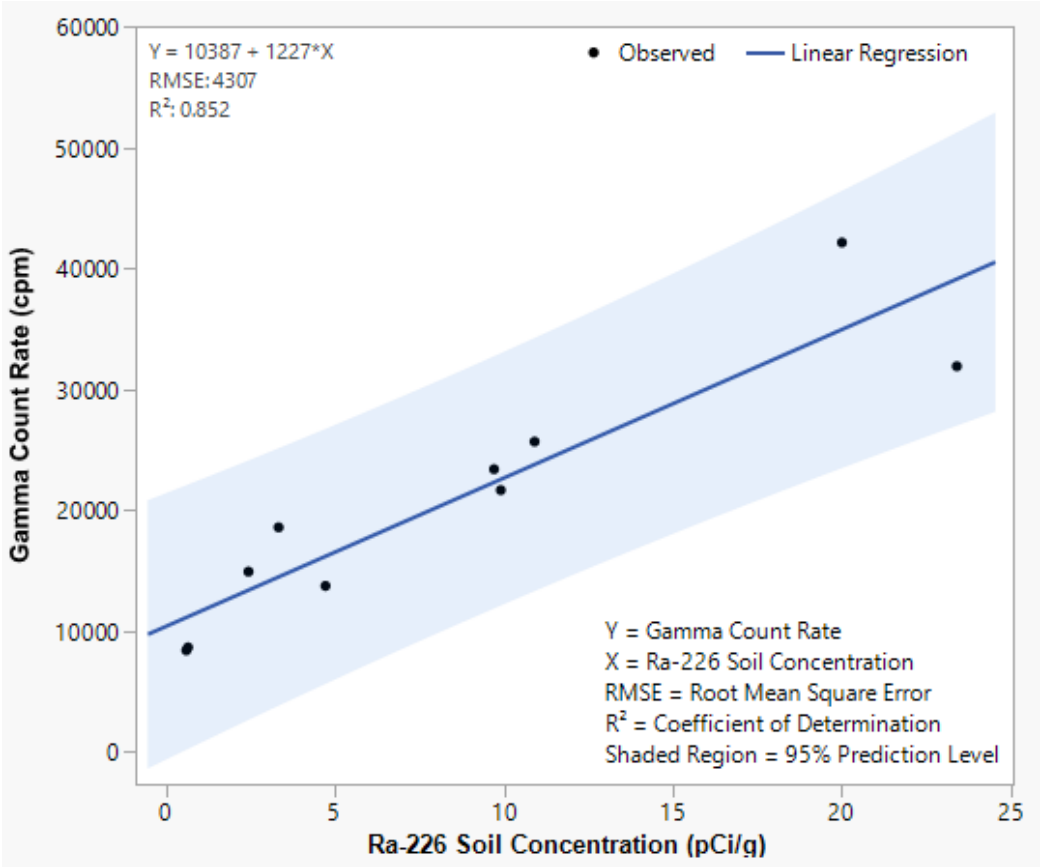


Figure C-9. Correlation of Gamma Count Rates and Concentrations of Radium-226 in Surface Soils (Blue Line) with 95% Prediction Level Bands for the Predicted Values (Shaded Region) Plotted for the Group I & J Region

Equation 9a: $$\gamma(cpm) = 10{,}387 + 1{,}227.3\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right)$$

Equation 9b: $$\left({}^{226}Ra\left[\frac{pCi}{g}\right]\right) = 0.000815\left(\gamma(cpm)\right) - 8.463$$

3.9 EXPOSURE RATE CORRELATION

Field personnel measured co-located static gamma count rates and exposure rates at 33 locations project-wide in June and August 2018. Sample plot locations were distributed across different mine sites, target sites, and background sites project-wide to achieve a representative distribution of measured exposure rates and gamma count rates. Twenty-nine of the 33 locations were within soil correlation plots. Four measurements were taken at locations without a corresponding soil correlation measurement location. Exposure rate correlation plot locations and gamma scan data are shown in Attachment C1. Table C-9 lists serial numbers of detectors and meters, with their dates of use.

Table C-9. Detector and Meter Serial Numbers and Dates of Use for Exposure Rate Correlation Measurements

Ludlum Model 44-10[1]	Ludlum Model 2221 Ratemeter/Scaler[1]	Dates Used
PR303716	149940	6/4/2018
		6/5/2018
		6/18/2018
		6/19/2018
PR355781	271424	8/19/2018

Note:
[1] Serial numbers for radiation instrument used.

The regression resulted in an R^2 of 0.99 which exceeded the applicable project DQO ($R^2 > 0.8$). Regression results are shown on Figure C-10, and regression Equation 10 follows.

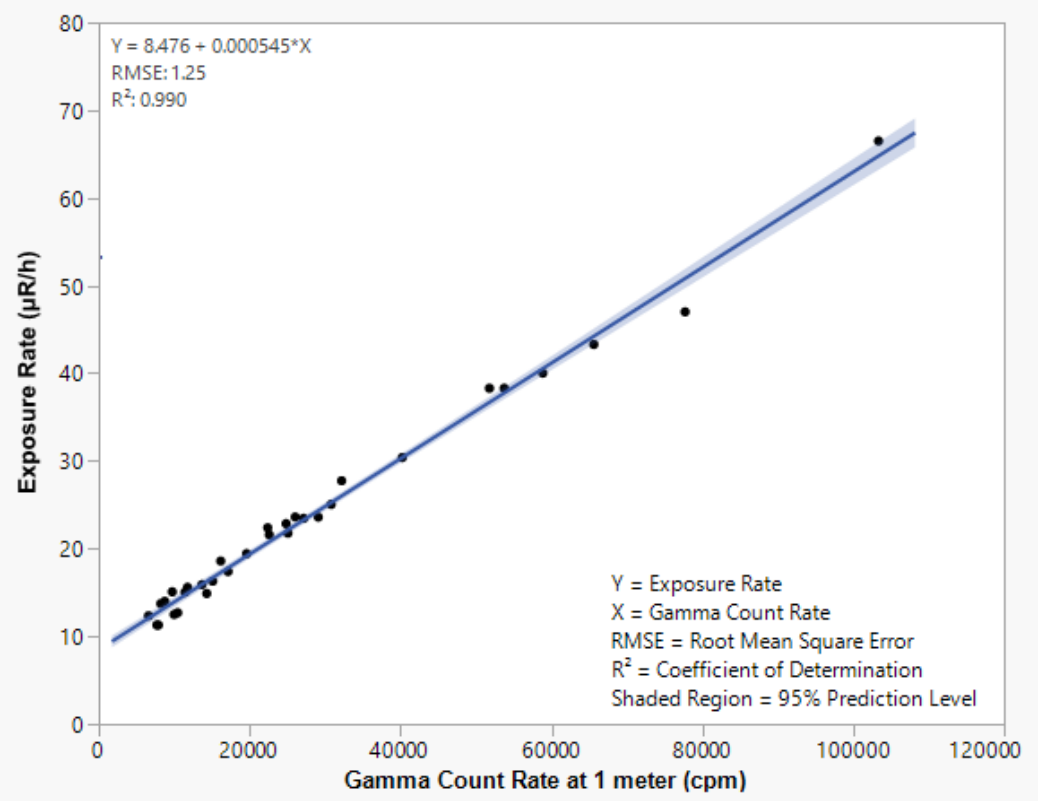


Figure C-10. Exposure Rate Gamma Count Rate Correlation

Equation 10: $$\gamma\left(\frac{\mu R}{hour}\right) = 8.476 + 0.000545 * (\gamma[cpm])$$

4.0 REFERENCES

ASTM International (ASTM). 2008. "Standard Practice for Dealing with Outlying Observations." Designation: E178 -08. November.

Tetra Tech, Inc. (Tetra Tech). 2018. "Northern Agency Tronox Mines Removal Site Evaluation Work Plan." Response, Assessment, and Evaluation Services. Contract No. EP-S9-17-02. Task Order 0001. May 14.

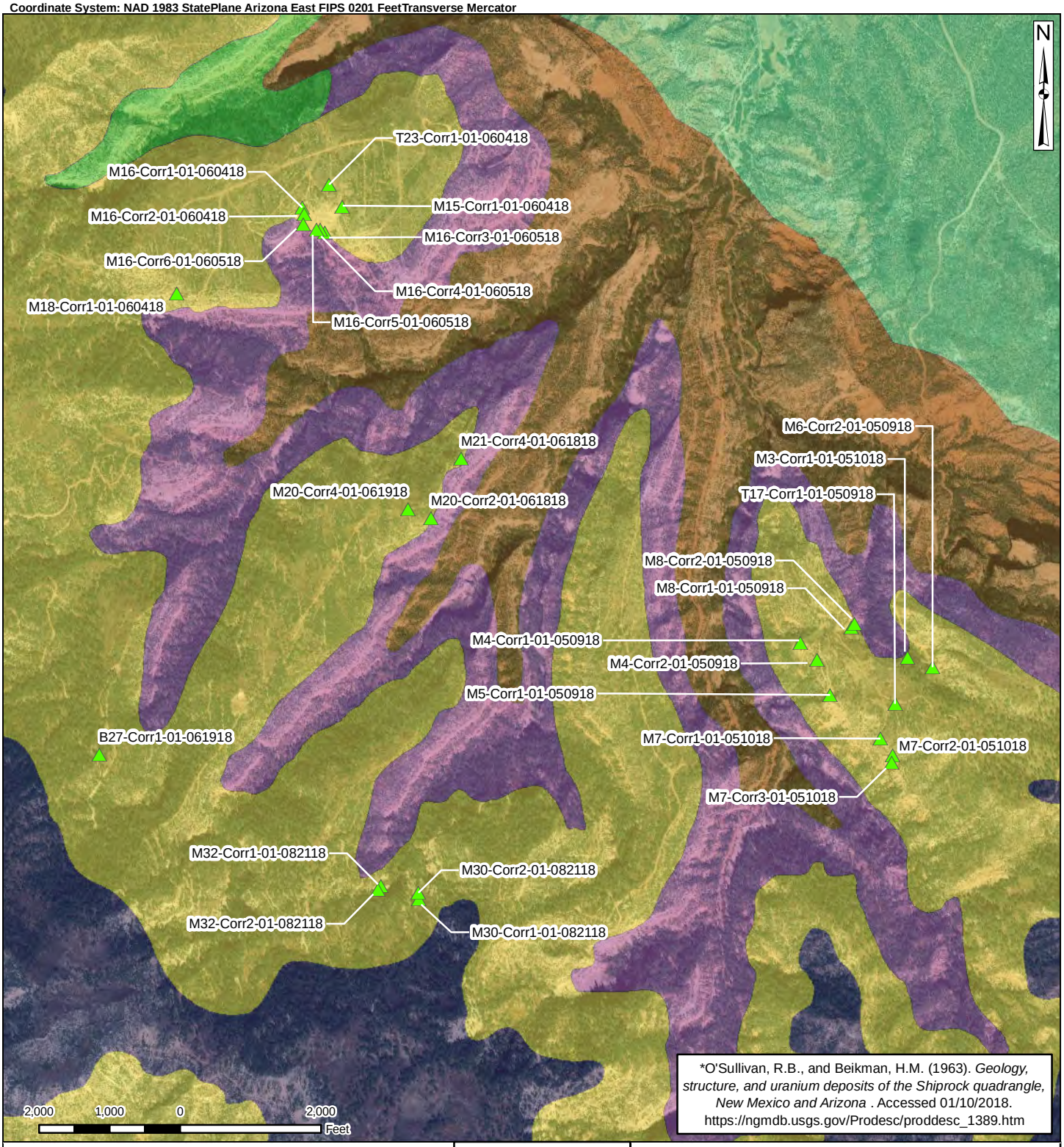
ATTACHMENT C1

CORRELATION MAPS AND SCAN DATA

ATTACHMENT C1-1

JML GEOLOGY CORRELATION MAPS AND SCAN DATA

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Correlation Sampling Location

Geologic Units*

- Carmel Formation - Jc
- Chinle Formation - TRC
- Chuska sandstone - Tc Morrison Formation
- (Lower) - Jml
- Summerville, Entrada Formation (Undifferentiated) - Jse
- Wingate Sandstone - TRW

Prepared for: U.S. EPA Region 9

Prepared By:

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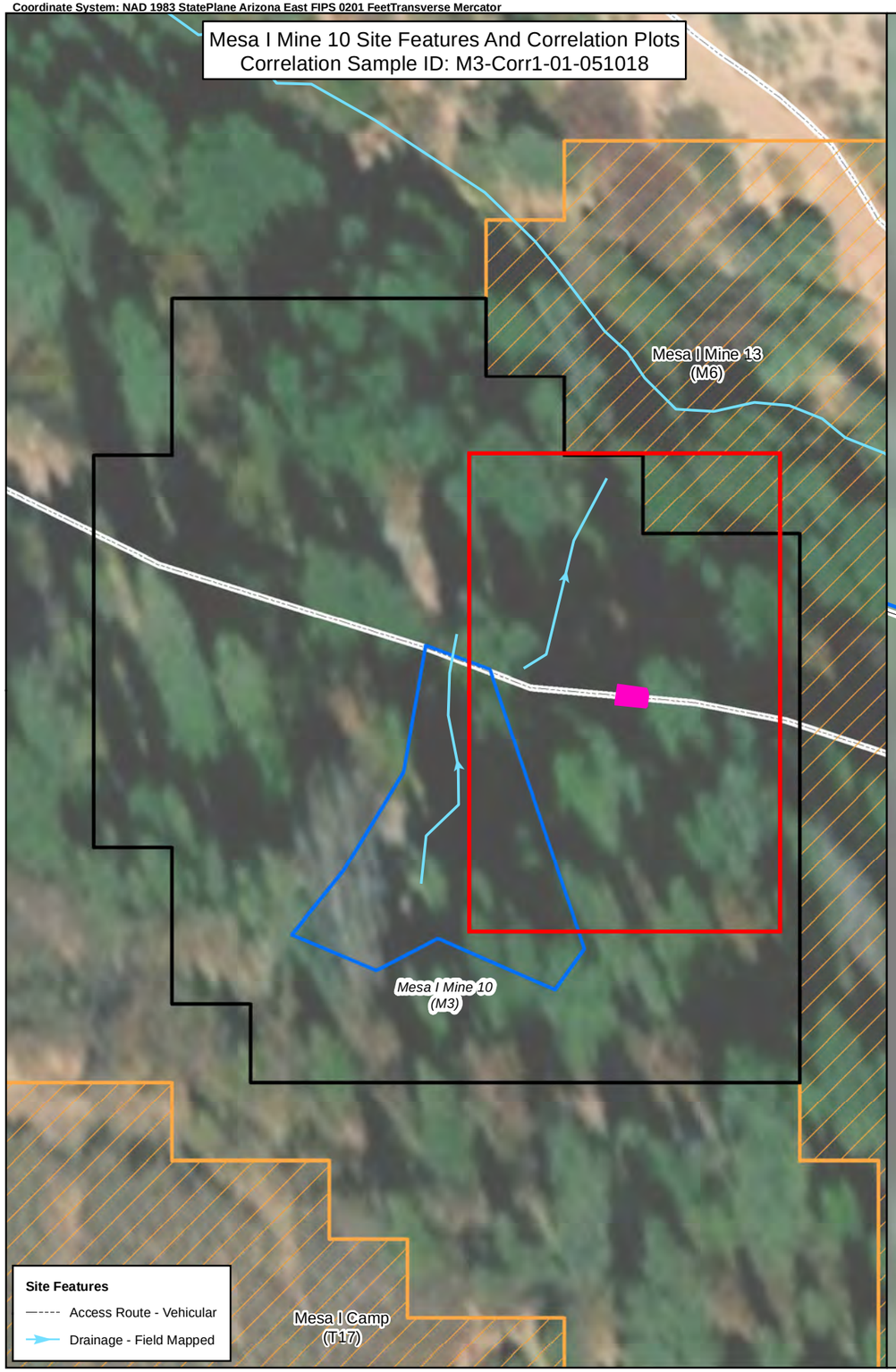
MORRISON LOWER FORMATION (JML) CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-1-1
Location: COVE CHAPTER NAVAJO NATION	Date: 6/9/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 10 Site Features And Correlation Plots
Correlation Sample ID: M3-Corr1-01-051018



Mesa I Mine 10 Correlation Gamma Radiation Survey
Correlation Sample ID: M3-Corr1-01-051018

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area
- Access Route - Vehicular

1 in = 56.67 ft

1:680

N W E S

0 30 60 120 Feet

MESA I MINE 10
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

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Oakland, CA 94612

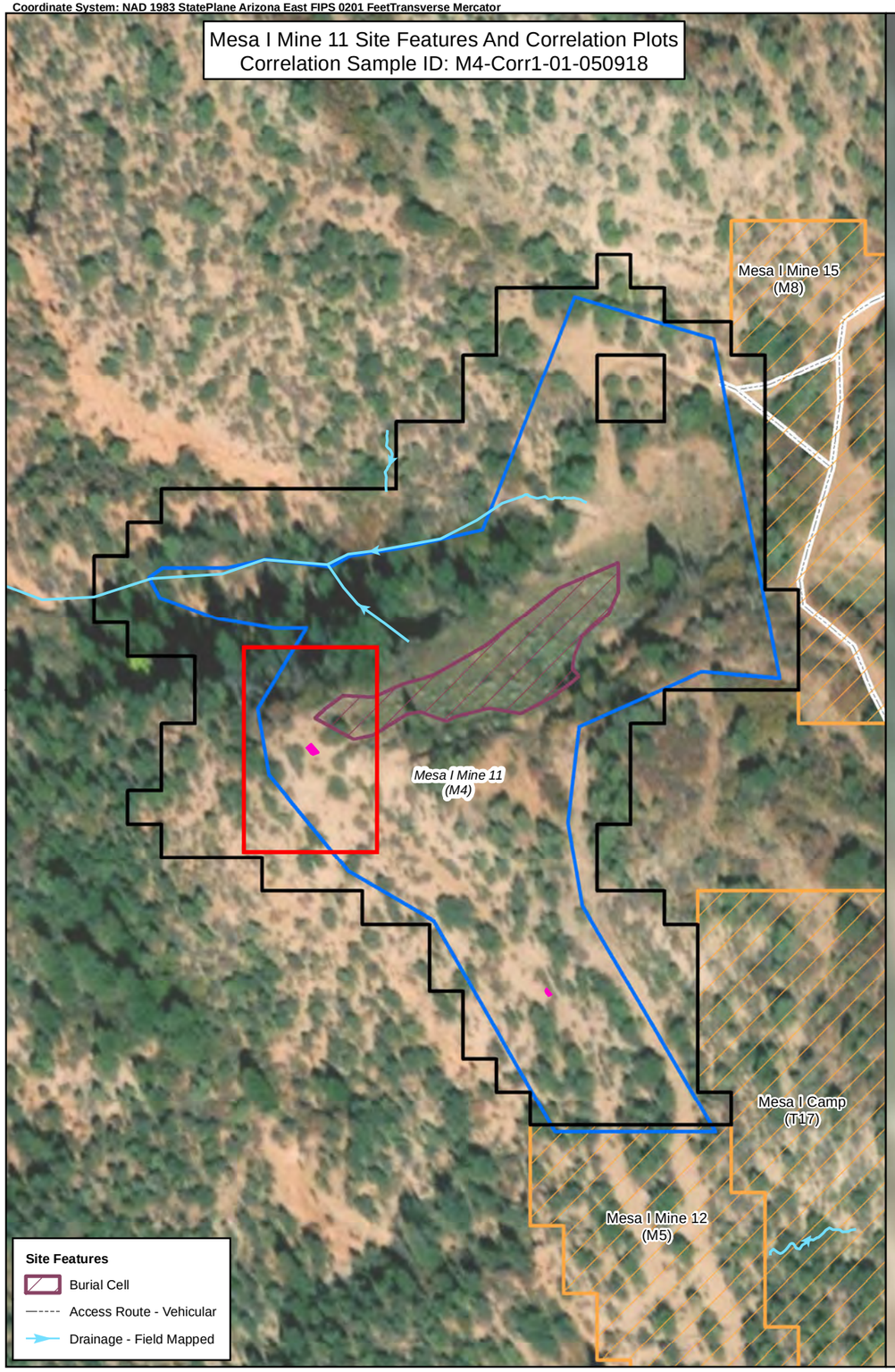
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/12/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-2

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 11 Site Features And Correlation Plots
Correlation Sample ID: M4-Corr1-01-050918



Mesa I Mine 11 Correlation Gamma Radiation Survey
Correlation Sample ID: M4-Corr1-01-050918

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 132.5 ft

1:1,590

N
W E
S

0 65 130 260 Feet

MESA I MINE 11
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Morisson lower formation (Jml) geologic unit.

Figure No.: C1-1-3

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 11 Site Features And Correlation Plots
Correlation Sample ID: M4-Corr2-01-050918

Mesa I Mine 15
(M8)

Mesa I Mine 11
(M4)

Mesa I Camp
(T17)

Mesa I Mine 12
(M5)

Site Features
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Mine 11 Correlation Gamma Radiation Survey
Correlation Sample ID: M4-Corr2-01-050918

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 132.5 ft

1:1,590

N W E S

0 65 130 260 Feet

MESA I MINE 11
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP
INSET 2 OF 2

Prepared For:

Prepared By:

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1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-4

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 12 Site Features And Correlation Plots
Correlation Sample ID: M5-Corr1-01-050918

Mesa I Mine 11
(M4)

BSA-10
(B10)

Mesa I Camp
(T17)

Middle 3

M1-04
(T16)

Mesa I Mine 12
(M5)

Middle 3A

Mesa I Mine 14
(M7)

Middle 3A

Middle 3E

M1-05
(T35)

Site Features

- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Mine 12 Correlation Gamma Radiation Survey
Correlation Sample ID: M5-Corr1-01-050918

0 10 20 40 Feet

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 240 ft

1:2,880

N W E S

0 110 220 440 Feet

MESA I MINE 12
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/12/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-5

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 13 Site Features And Correlation Plots
Correlation Sample ID: M6-Corr2-01-050918

Mesa I Mine 10
(M3)

Mesa I Mine 13
(M6)

Mesa I Camp
(T17)

M1-03
(T15)

Site Features
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Mine 13 Correlation Gamma Radiation Survey
Correlation Sample ID: M6-Corr2-01-050918

Middle SF

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 157.5 ft

1:1,890

N W E S

0 80 160 320 Feet

MESA I MINE 13
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/12/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-6

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 14 Site Features And Correlation Plots
Correlation Sample ID: M7-Corr1-01-051018

(T15)

M1-03
(T15)

Mesa I Mine 12
(M5)

Mesa I Mine 14
(M7)

M1-06
(T36)

Site Features

Drainage - Field Mapped

Mesa I Mine 14 Correlation Gamma Radiation Survey
Correlation Sample ID: M7-Corr1-01-051018

0 10 20 40 Feet

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 132.5 ft

1:1,590

N
W E
S

0 62.5 125 250 Feet

MESA I MINE 14
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/12/2019

Notes:

*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-7

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 14 Site Features And Correlation Plots

(T15)

M1-03
(T15)

Mesa I Mine 12
(M5)

Mesa I Mine 14
(M7)

M1-06
(T36)

Site Features

Drainage - Field Mapped

Mesa I Mine 14 Correlation Gamma Radiation Survey

M7-Corr2-01-051018

M7-Corr3-01-051018

0 10 20 40 Feet

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425

Extent of Correlation Plot
AUM Site Boundary
Survey Area Boundary
Other Survey Area

1 in = 132.5 ft

1:1,590

N
W E
S

0 62.5 125 250 Feet

MESA I MINE 14
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/12/2019

Notes:

*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-8

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 15 Site Features And Correlation Plots

Mesa I Mine 11
(M4)

BSA-10
(B10)

Mesa I Camp
(T17)

Site Features
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Mine 15 Correlation Gamma Radiation Survey

M8-Corr2-01-050918

M8-Corr1-01-050918

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

MESA I MINE 15 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/12/2019

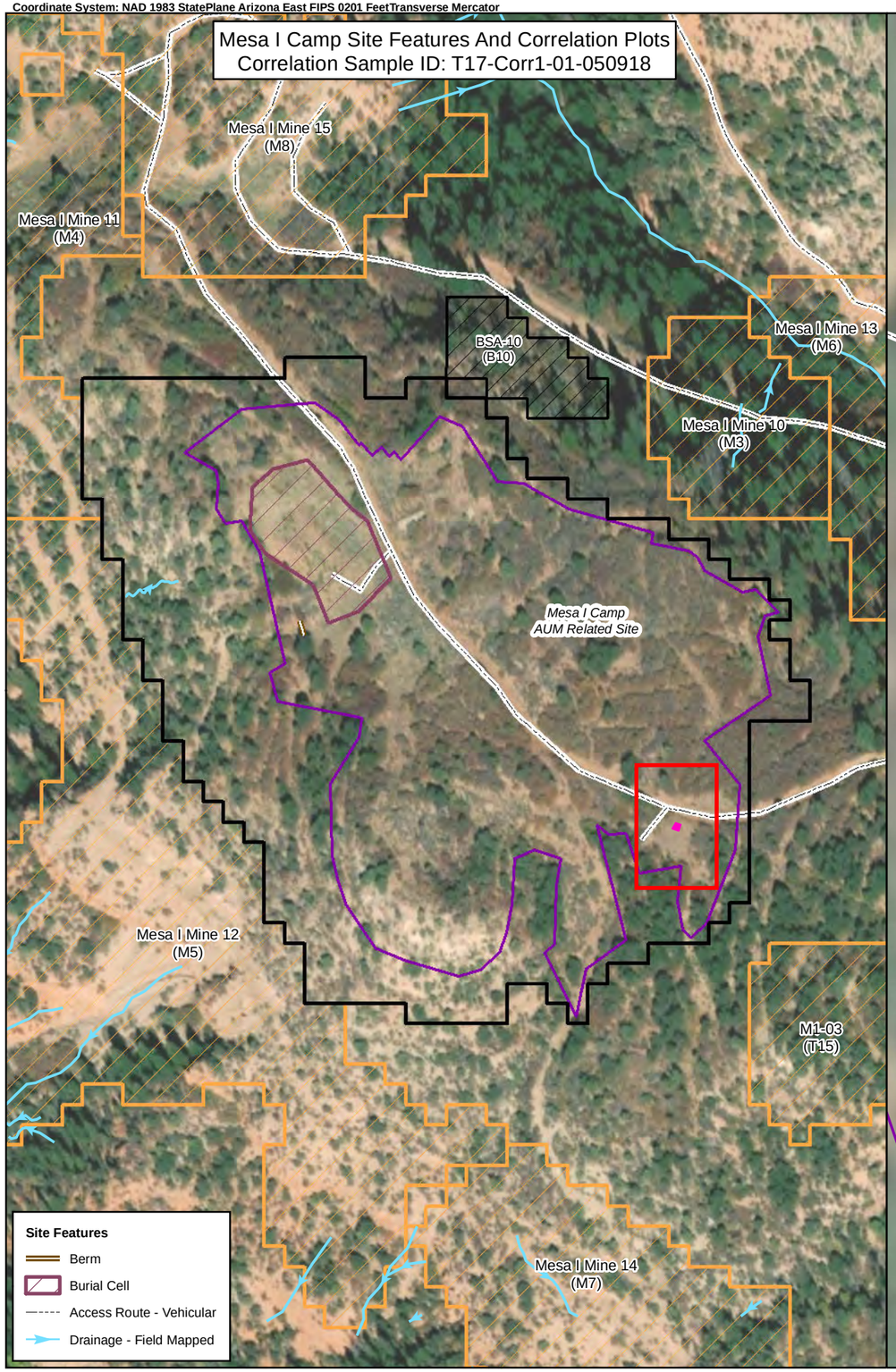
Notes:

*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-9

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Camp Site Features And Correlation Plots
Correlation Sample ID: T17-Corr1-01-050918



Site Features
- Berm
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Camp Correlation Gamma Radiation Survey
Correlation Sample ID: T17-Corr1-01-050918

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Related Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 220 ft

1:2,640

N W E S

0 110 220 440 Feet

MESA I CAMP CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-10

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Adit Site Features And Correlation Plots

M5-06 (T22)

NA-0344B (T23)

Mesa V Incline (M15)

Mesa V Adit Mine (M16)

Mesa V Mine (M17)

Middle 1A

Middle 1A

Middle 1A

Middle 1A

Site Features

- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa V Adit Correlation Gamma Radiation Survey

M16-Corr1-01-060418

M16-Corr2-01-060418

0 10 20 40 Feet

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 125.83 ft

1:1,510

N W E S

0 60 120 240 Feet

MESA V ADIT CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 1 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-11

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Adit Site Features And Correlation Plots
Correlation Sample ID: M16-Corr6-01-060518

M5-06
(T22)

NA-0344B
(T23)

Mesa V Incline
(M15)

Mesa V Adit Mine
(M16)

Mesa V Mine
(M17)

Middle 1A

Middle 1A

Middle 1A

Middle 1A

Site Features
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa V Adit Correlation Gamma Radiation Survey
Correlation Sample ID: M16-Corr6-01-060518

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 125.83 ft

1:1,510

N W E S

0 60 120 240 Feet

MESA V ADIT
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-12

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Adit Site Features And Correlation Plots

M5-06
(T22)

NA-0344B
(T23)

Mesa V Incline
(M15)

Mesa V Adit Mine
(M16)

Mesa V Mine
(M17)

Middle 1A

Middle 1A

Middle 1A

Middle 1A

Site Features
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa V Adit Correlation Gamma Radiation Survey

M16-Corr5-01-060518

M16-Corr4-01-060518

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 125.83 ft

1:1,510

N W E S

0 60 120 240 Feet

MESA V ADIT
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 3 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-13

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Adit Site Features And Correlation Plots
Correlation Sample ID: M16-Corr3-01-060518

M5-06
(T22)

NA-0344B
(T23)

Mesa V Incline
(M15)

Mesa V Adit Mine
(M16)

Mesa V Mine
(M17)

Middle 1A

Middle 1A

Middle 1A

Middle 1A

Site Features
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa V Adit Correlation Gamma Radiation Survey
Correlation Sample ID: M16-Corr3-01-060518

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 125.83 ft

1:1,510

N W E S

0 60 120 240 Feet

MESA V ADIT
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 4 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

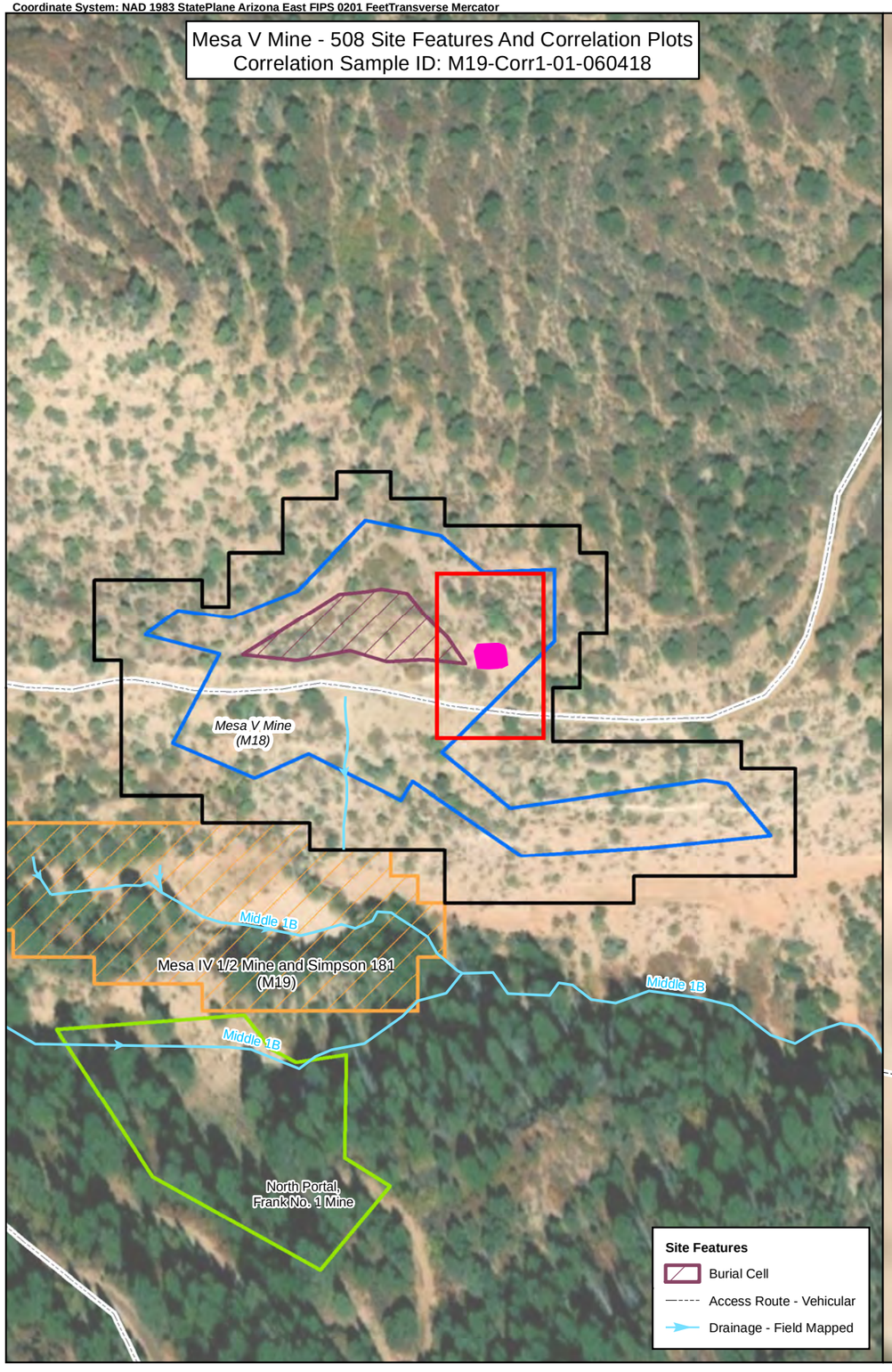
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

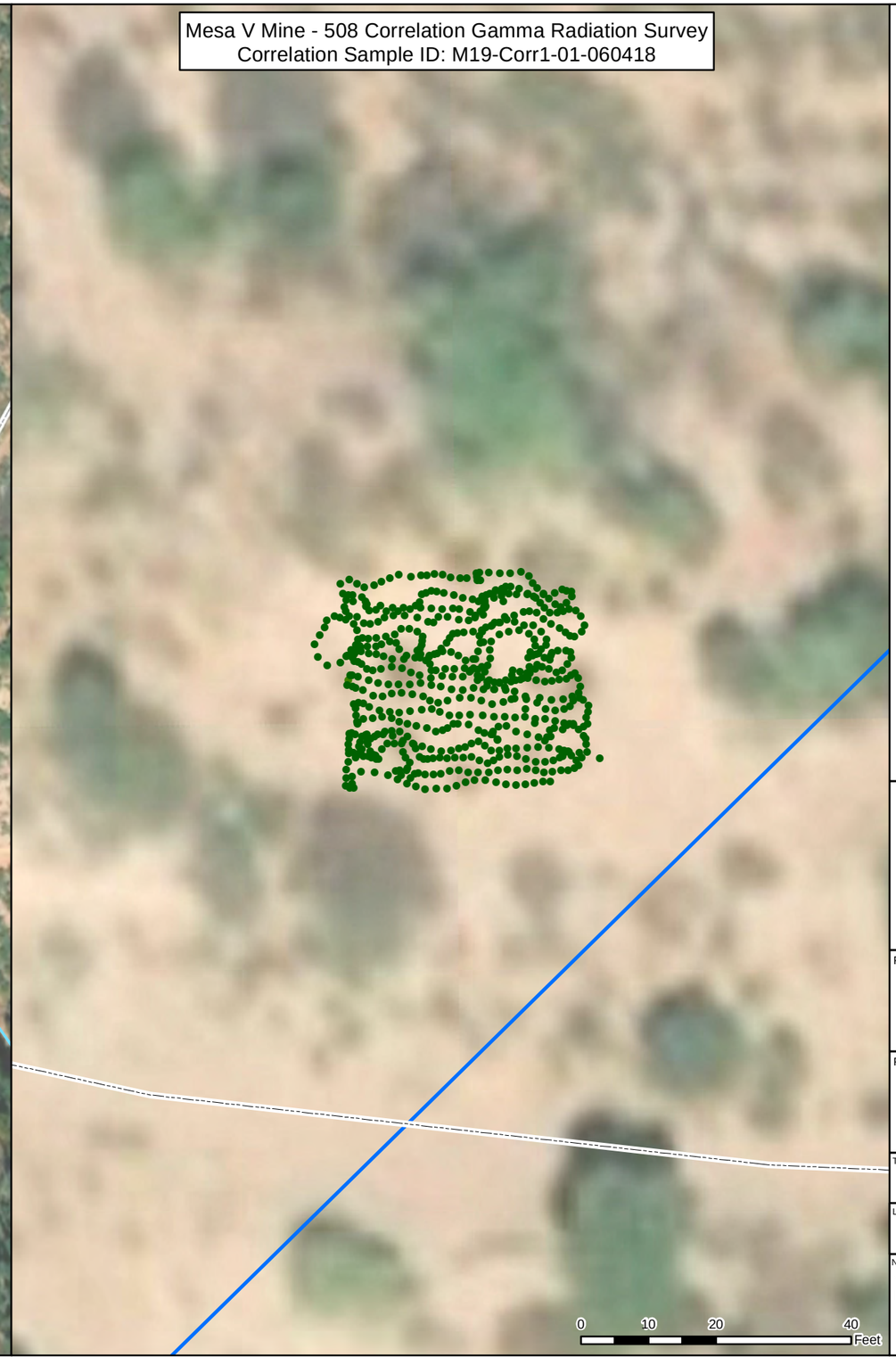
Figure No.: C1-1-14

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Mine - 508 Site Features And Correlation Plots
Correlation Sample ID: M19-Corr1-01-060418



Mesa V Mine - 508 Correlation Gamma Radiation Survey
Correlation Sample ID: M19-Corr1-01-060418



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area
- Non-Tronox AUM Site

1 in = 164.17 ft

1:1,970

N
W E
S

0 80 160 320 Feet

MESA V MINE - 508
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

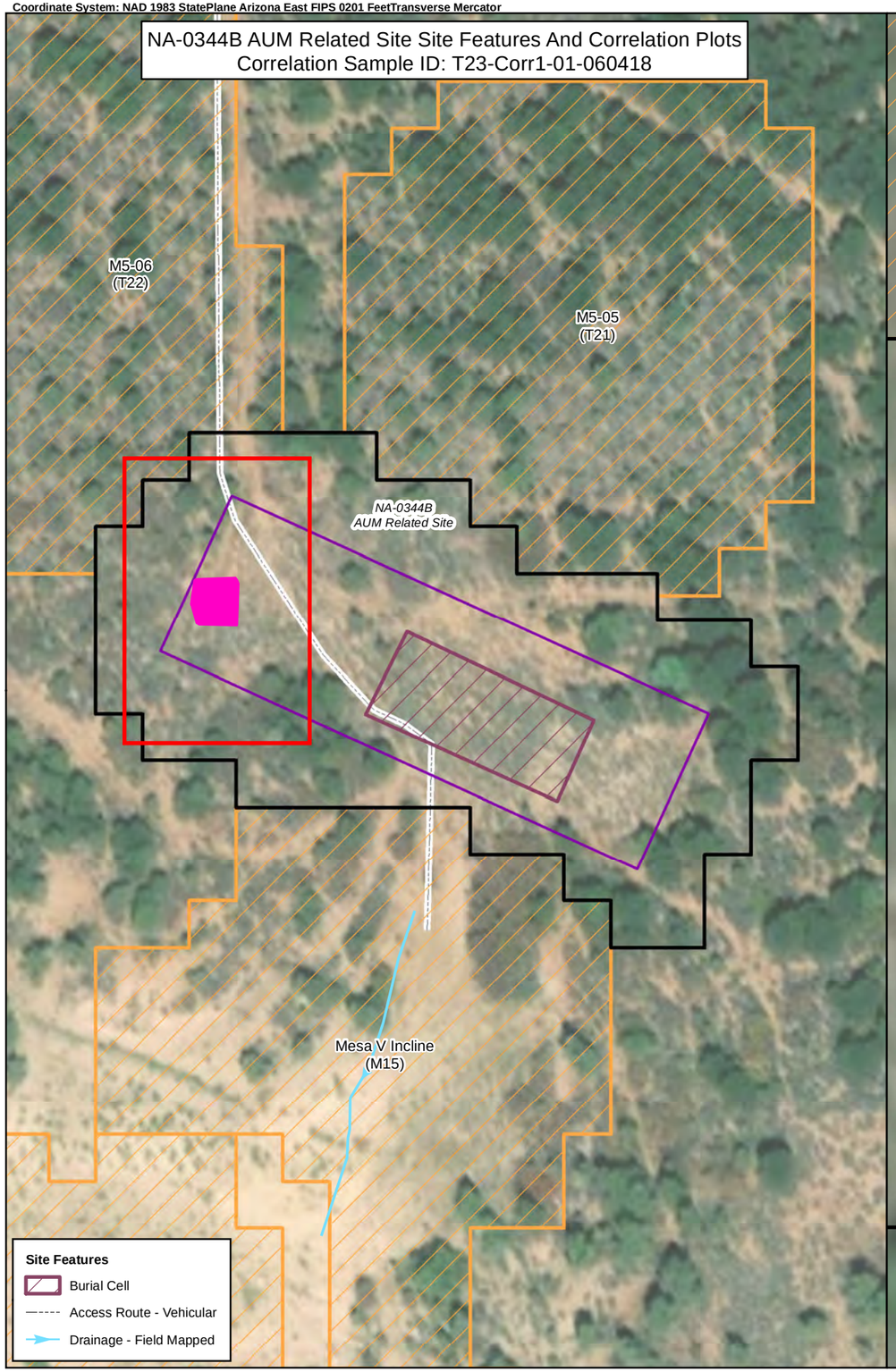
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-15

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

NA-0344B AUM Related Site Site Features And Correlation Plots
Correlation Sample ID: T23-Corr1-01-060418



Site Features
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

NA-0344B AUM Related Site Correlation Gamma Radiation Survey
Correlation Sample ID: T23-Corr1-01-060418

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Related Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 95 ft

1:1,140

N W E S

0 45 90 180 Feet

NA-0344B AUM-RELATED SITE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

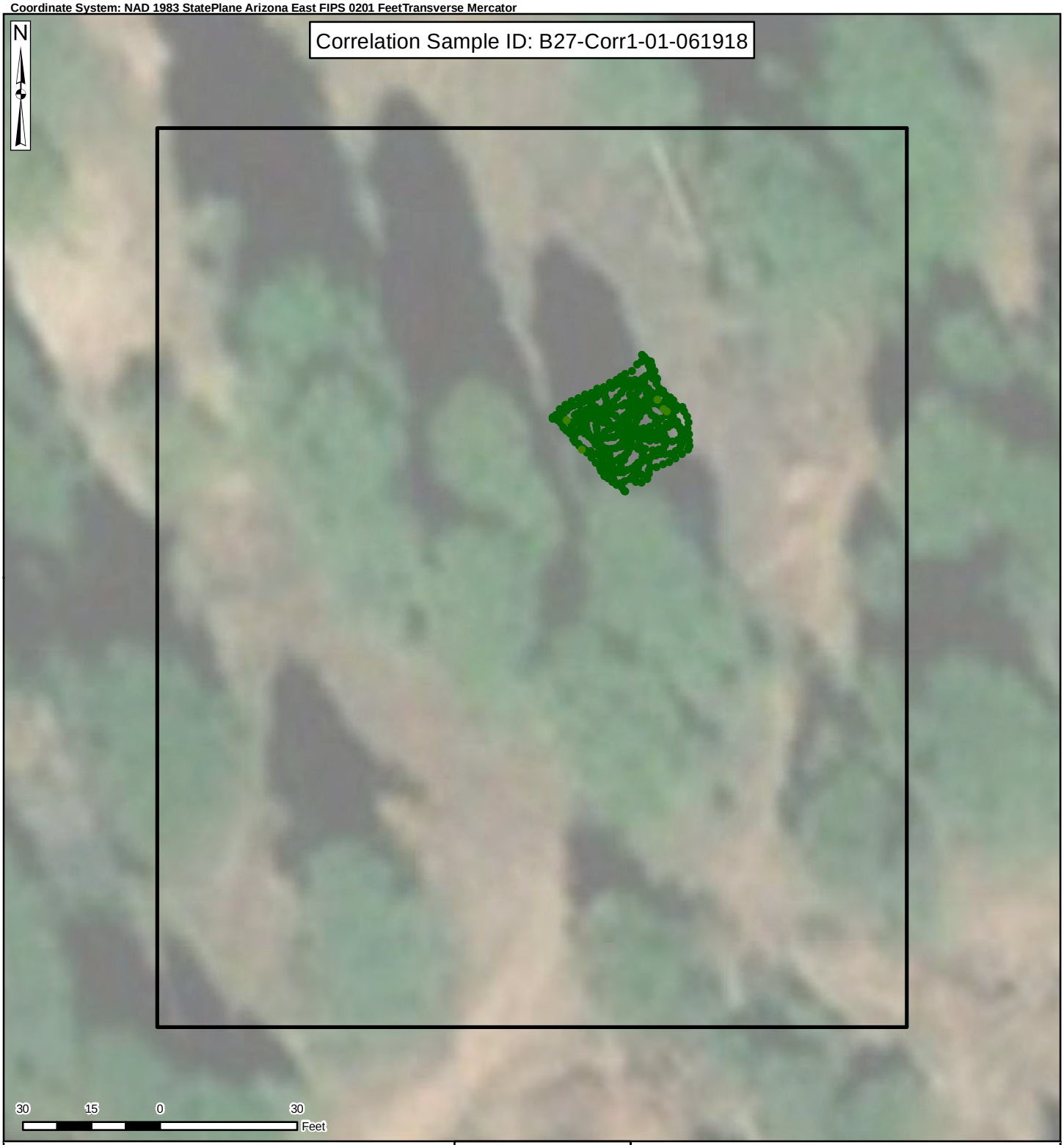
TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-16

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425

Background Location

*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Prepared for: U.S. EPA Region 9

Prepared By:

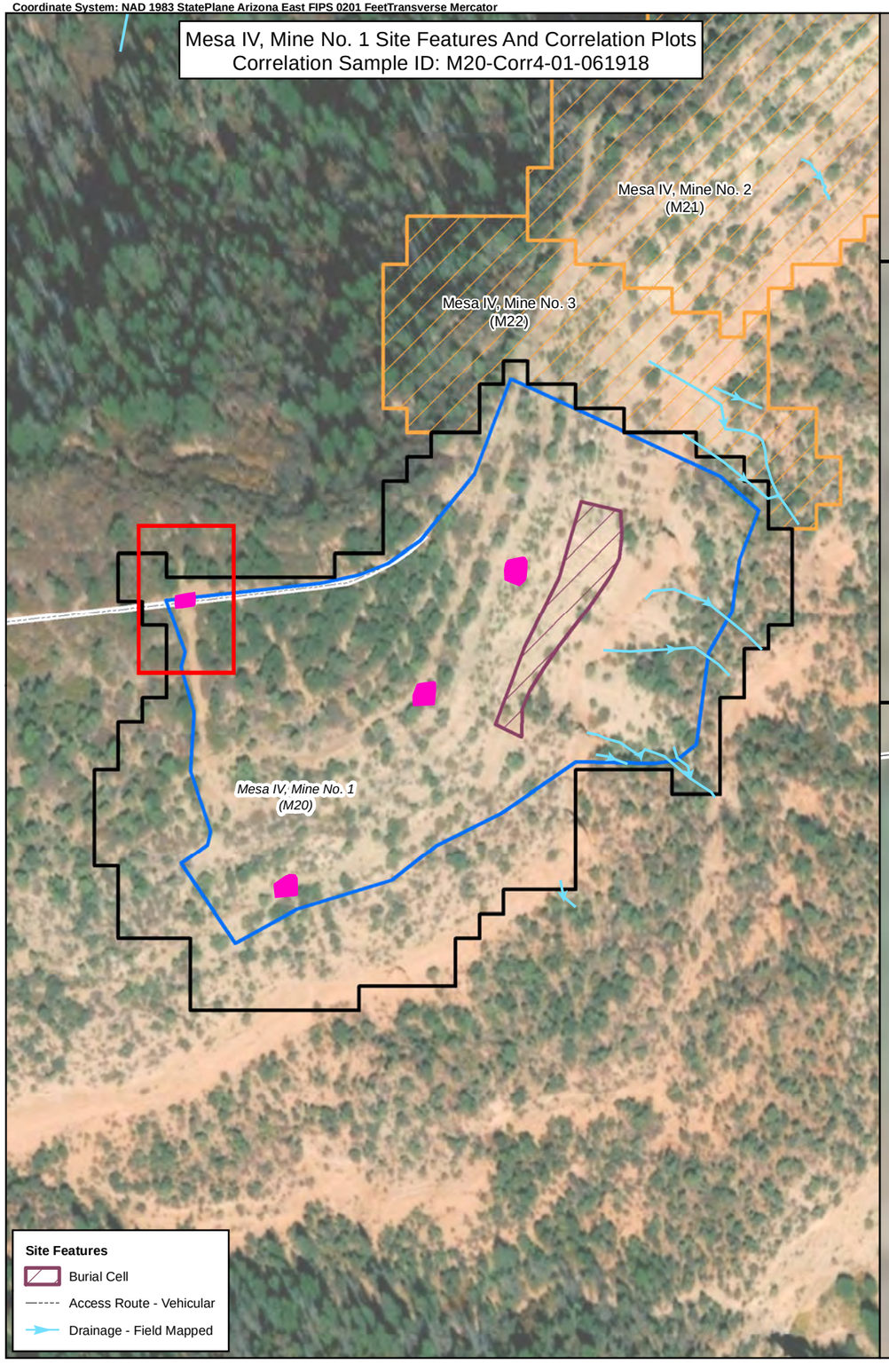
TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

BSA-27 BACKGROUND SITE CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-1-17
Location: COVE CHAPTER NAVAJO NATION	Date: 5/24/2019	

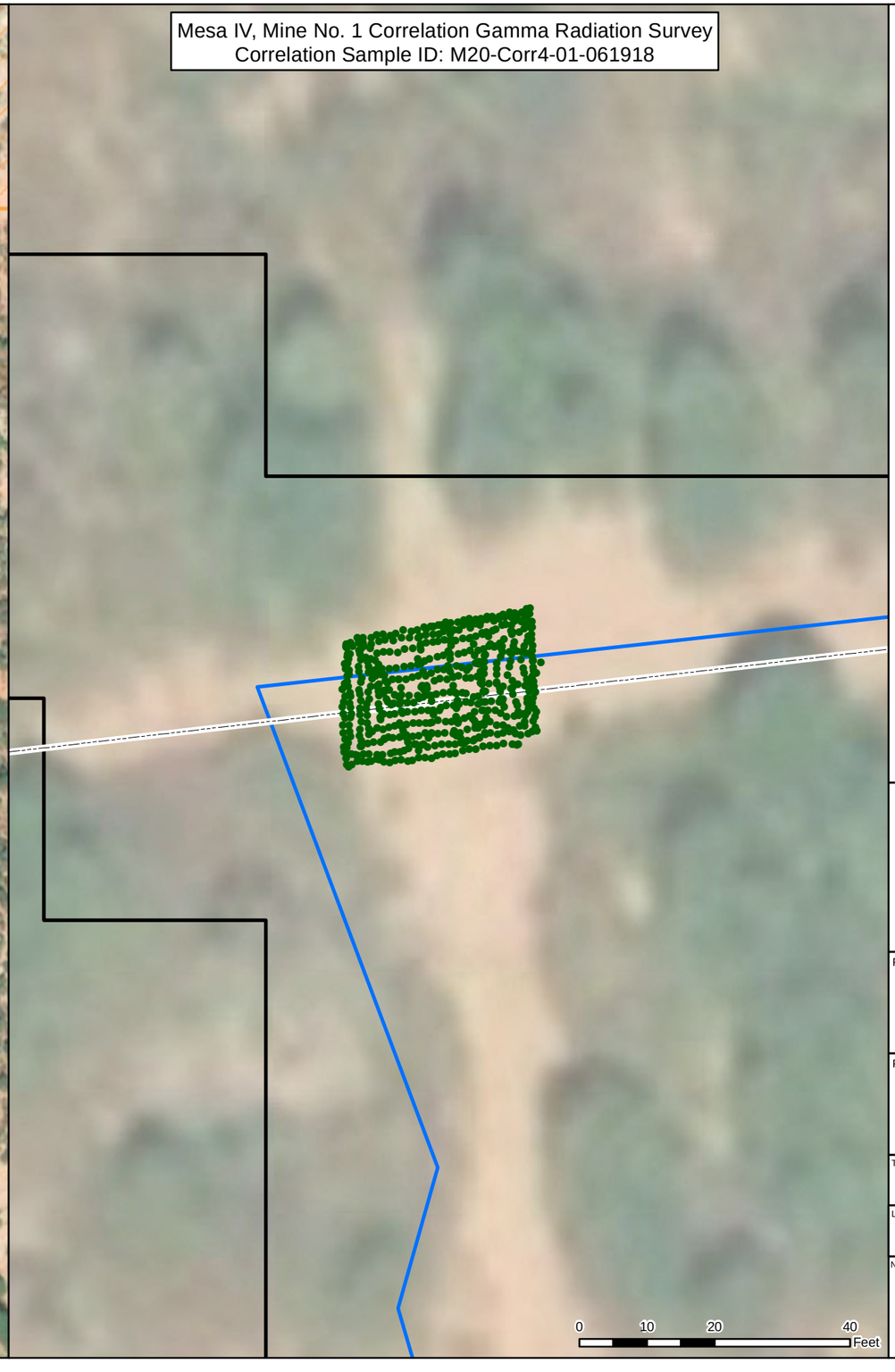
Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 1 Site Features And Correlation Plots
Correlation Sample ID: M20-Corr4-01-061918



Site Features
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa IV, Mine No. 1 Correlation Gamma Radiation Survey
Correlation Sample ID: M20-Corr4-01-061918



Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 183.33 ft

1:2,200

N
W E
S

0 90 180 360 Feet

MESA IV, MINE NO. 1
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

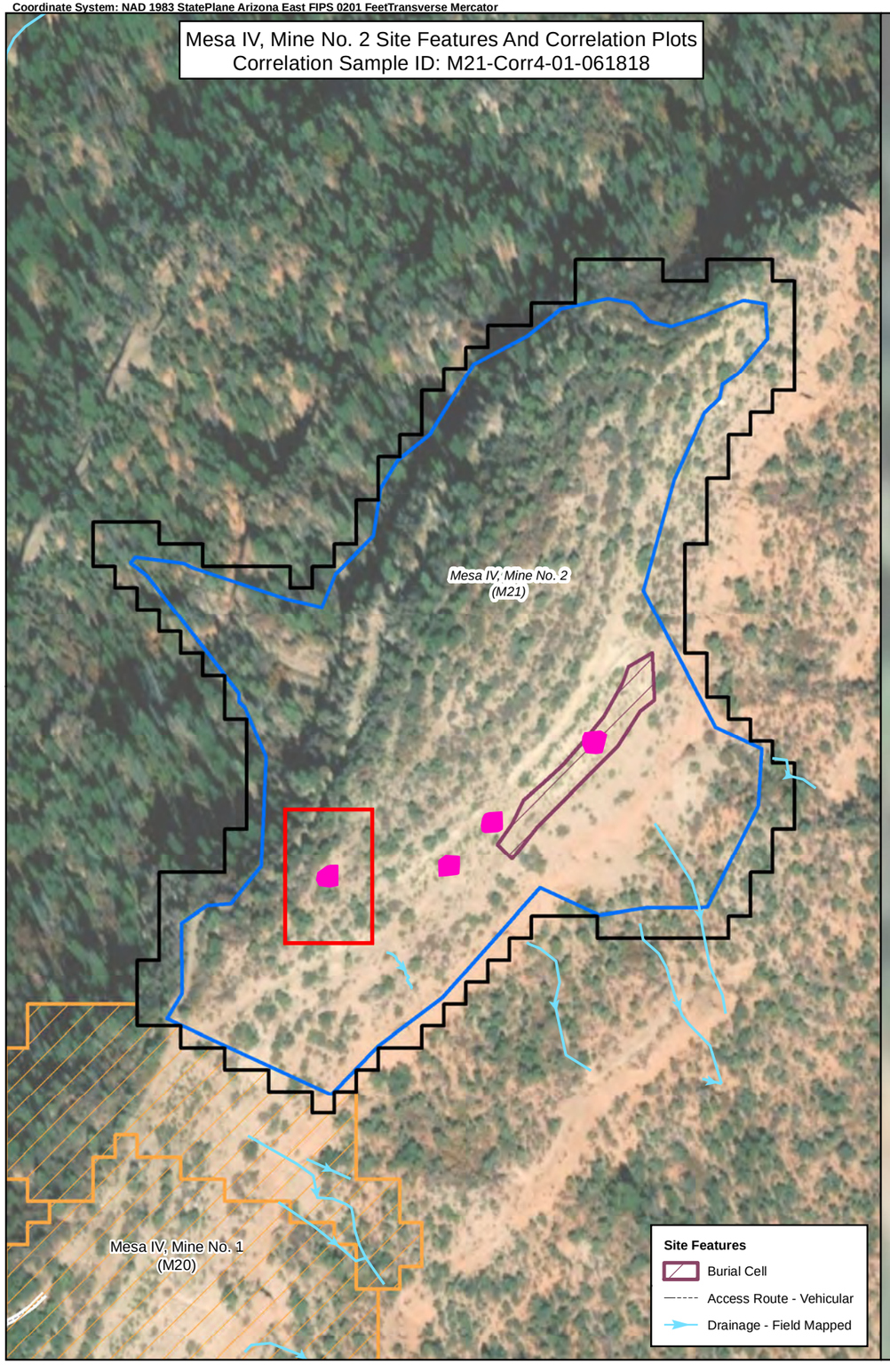
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-18

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 2 Site Features And Correlation Plots
Correlation Sample ID: M21-Corr4-01-061818



Mesa IV, Mine No. 2 Correlation Gamma Radiation Survey
Correlation Sample ID: M21-Corr4-01-061818

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 201.67 ft

1:2,420

N W E S

0 100 200 400 Feet

MESA IV, MINE NO. 2 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

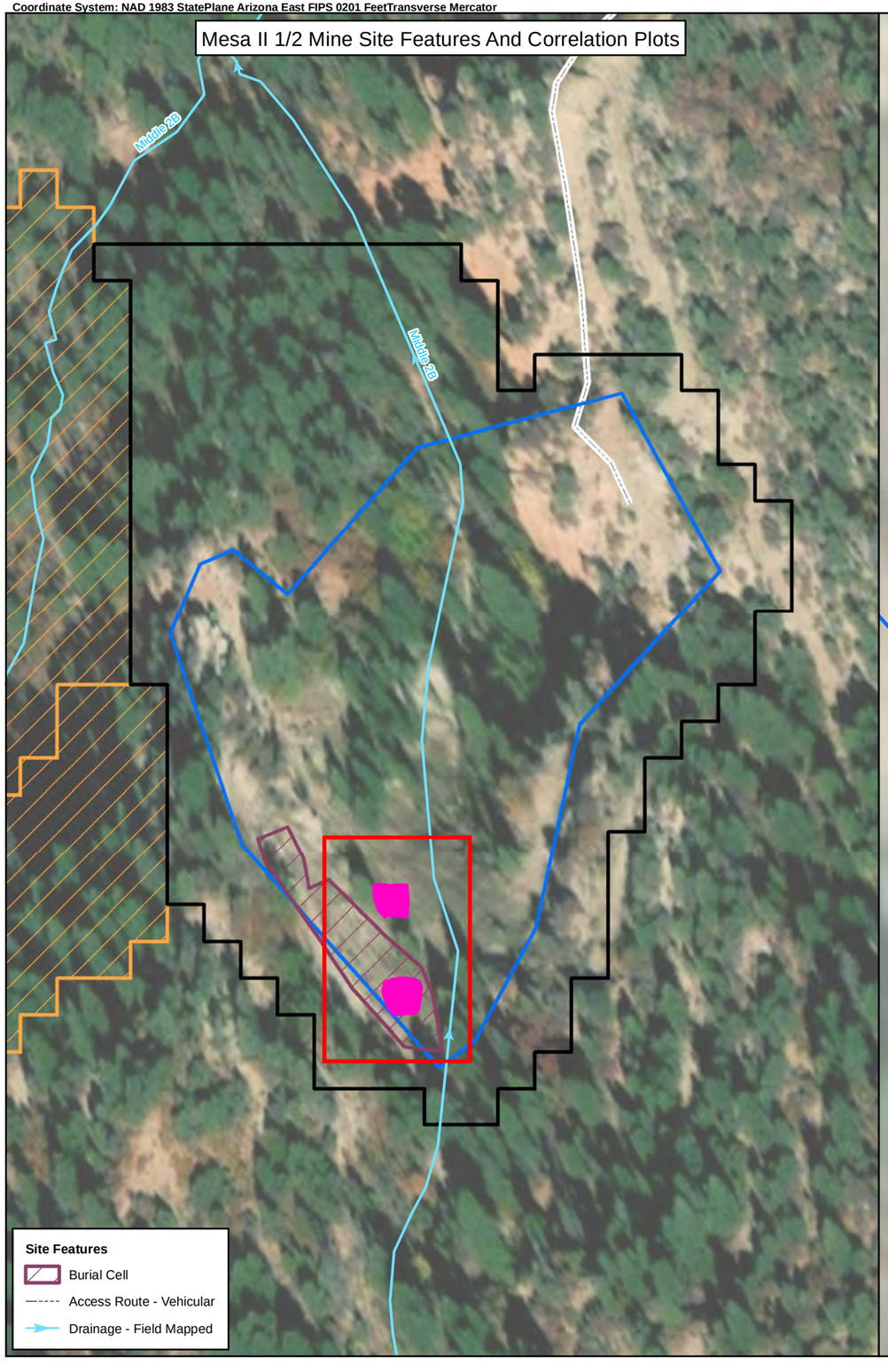
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-19

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa II 1/2 Mine Site Features And Correlation Plots



Site Features
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa II 1/2 Mine Correlation Gamma Radiation Survey

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 120 ft

1:1,440

0 55 110 220 Feet

N W E S

MESA II 1/2 MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-20

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa III Mine Site Features And Correlation Plots

Mesa II 1/2 Mine (M30)

Middle 2B

Mesa III Mine (M32)

Mesa II 1/2, Mine 4 (M31)

Site Features

Drainage - Field Mapped

Mesa III Mine Correlation Gamma Radiation Survey

M32-Corr1-01-082118

M32-Corr2-01-082118

Middle 2B

0 10 20 40 Feet

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 107.5 ft

1:1,290

N W E S

0 50 100 200 Feet

MESA III MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/13/2019

Notes:

*Correlation plot lies within the Lower Morrison Formation (Jml) geologic unit.

Figure No.: C1-1-21

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Incline Site Features And Correlation Plots
Correlation Sample ID: M15-Corr1-01-060418

NA-0344B
(T23)

Mesa V Incline Mine
(M15)

Mesa V Adit
(M16)

Site Features
- Closed Portal
- Berm
- Highwall - Reclaimed
- Waste Pile - Reclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa V Incline Correlation Gamma Radiation Survey
Correlation Sample ID: M15-Corr1-01-060418

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 80 ft

1:960

N W E S

0 40 80 160 Feet

MESA V INCLINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

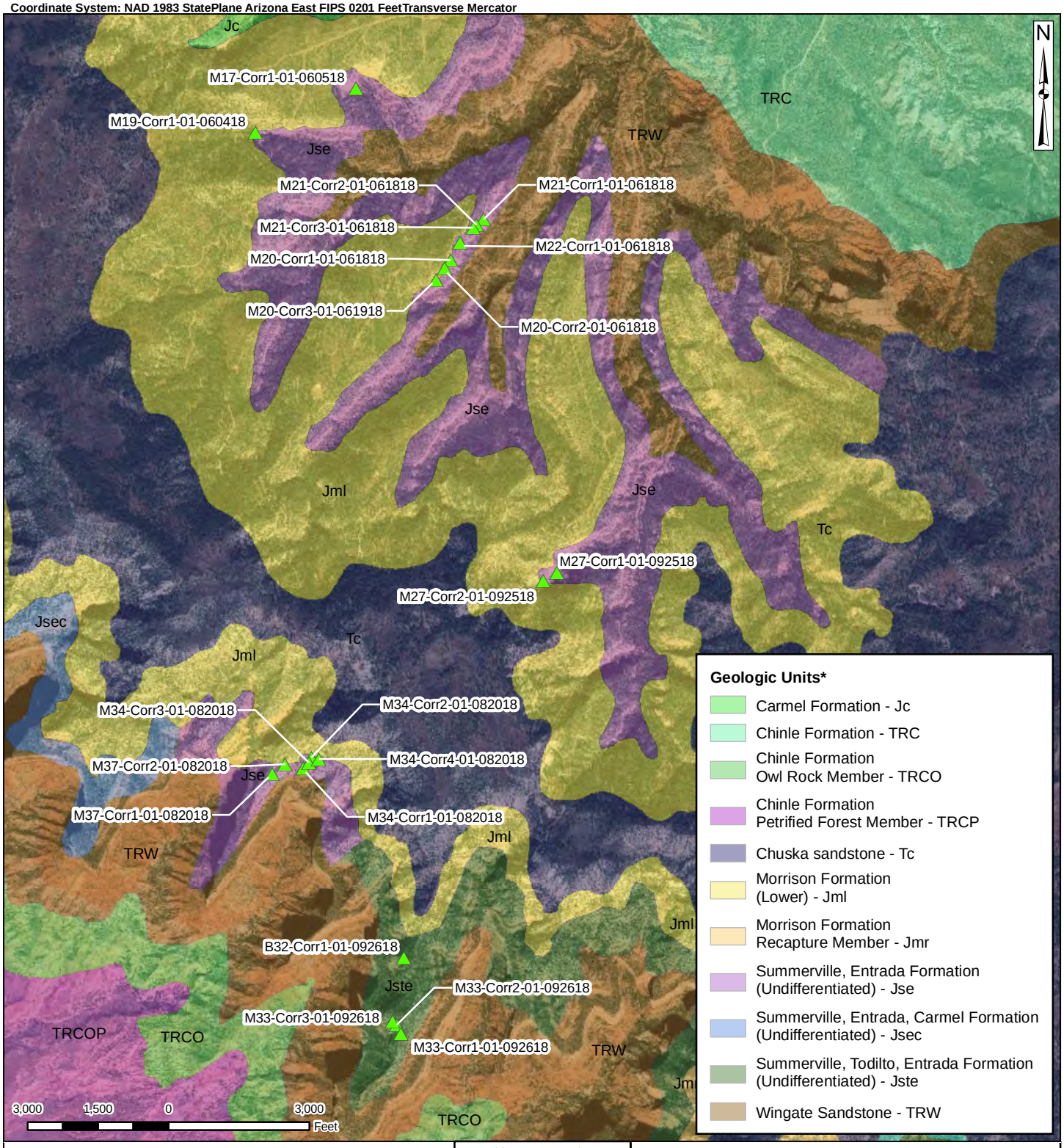
Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation.

Figure No.: C1-1-22

ATTACHMENT C1-2

JSE & JSTE GEOLOGY CORRELATION MAPS AND SCAN DATA

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Correlation Sampling Location

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for: U.S. EPA Region 9

Prepared By:

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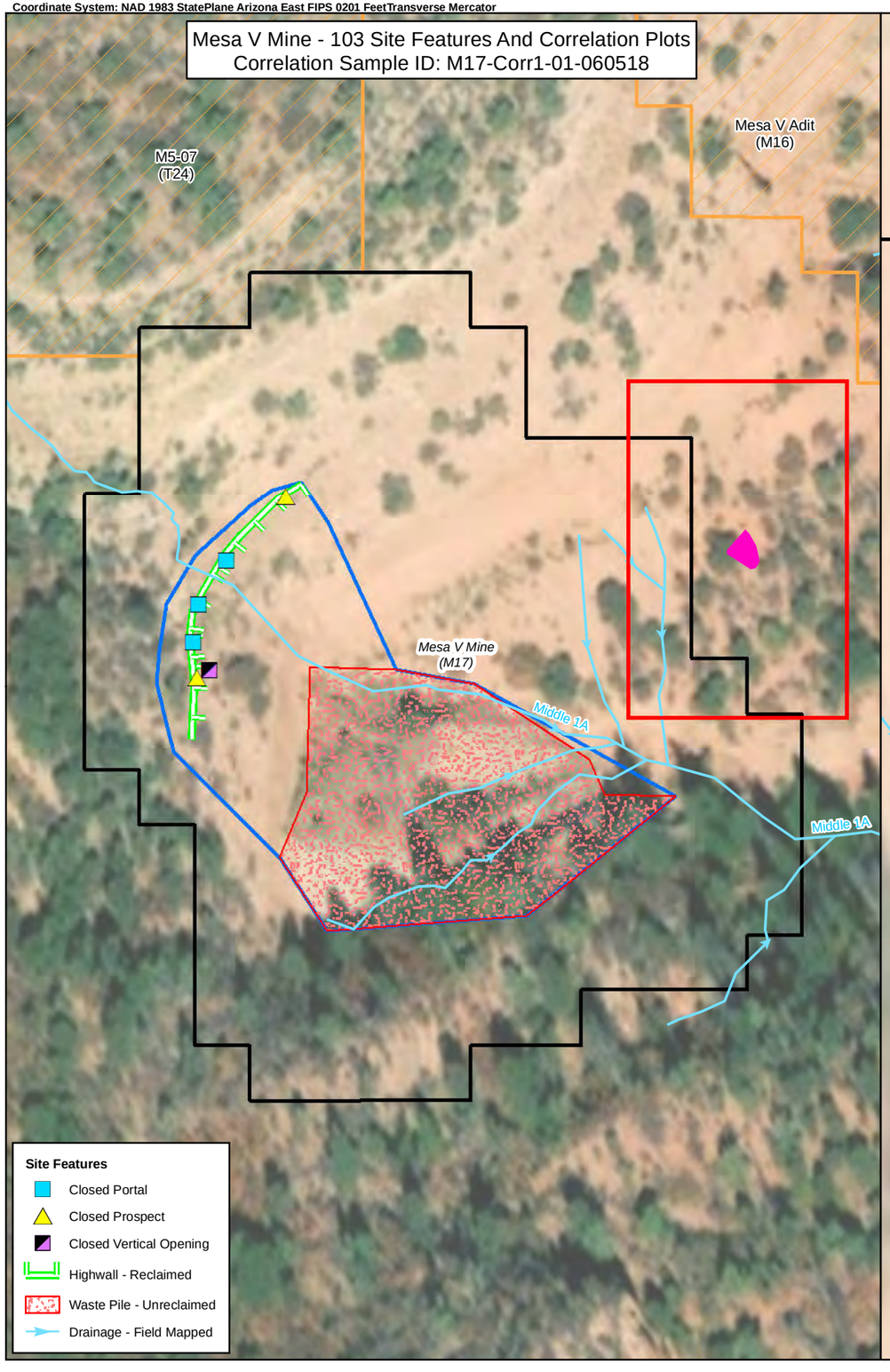
SUMMERVILLE, ENTRADA (JSE) AND SUMMERVILLE, TODILTO, ENTRADA (JSTE) CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-2-1
Location: COVE CHAPTER NAVAJO NATION	Date: 6/20/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Mine - 103 Site Features And Correlation Plots
Correlation Sample ID: M17-Corr1-01-060518



Site Features
- Closed Portal
- Closed Prospect
- Closed Vertical Opening
- Highwall - Reclaimed
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Mesa V Mine - 103 Correlation Gamma Radiation Survey
Correlation Sample ID: M17-Corr1-01-060518

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- Survey Area Boundary
- Other Survey Area

1 in = 80 ft

1:960

N W E S

0 40 80 160 Feet

MESA V MINE - 103
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

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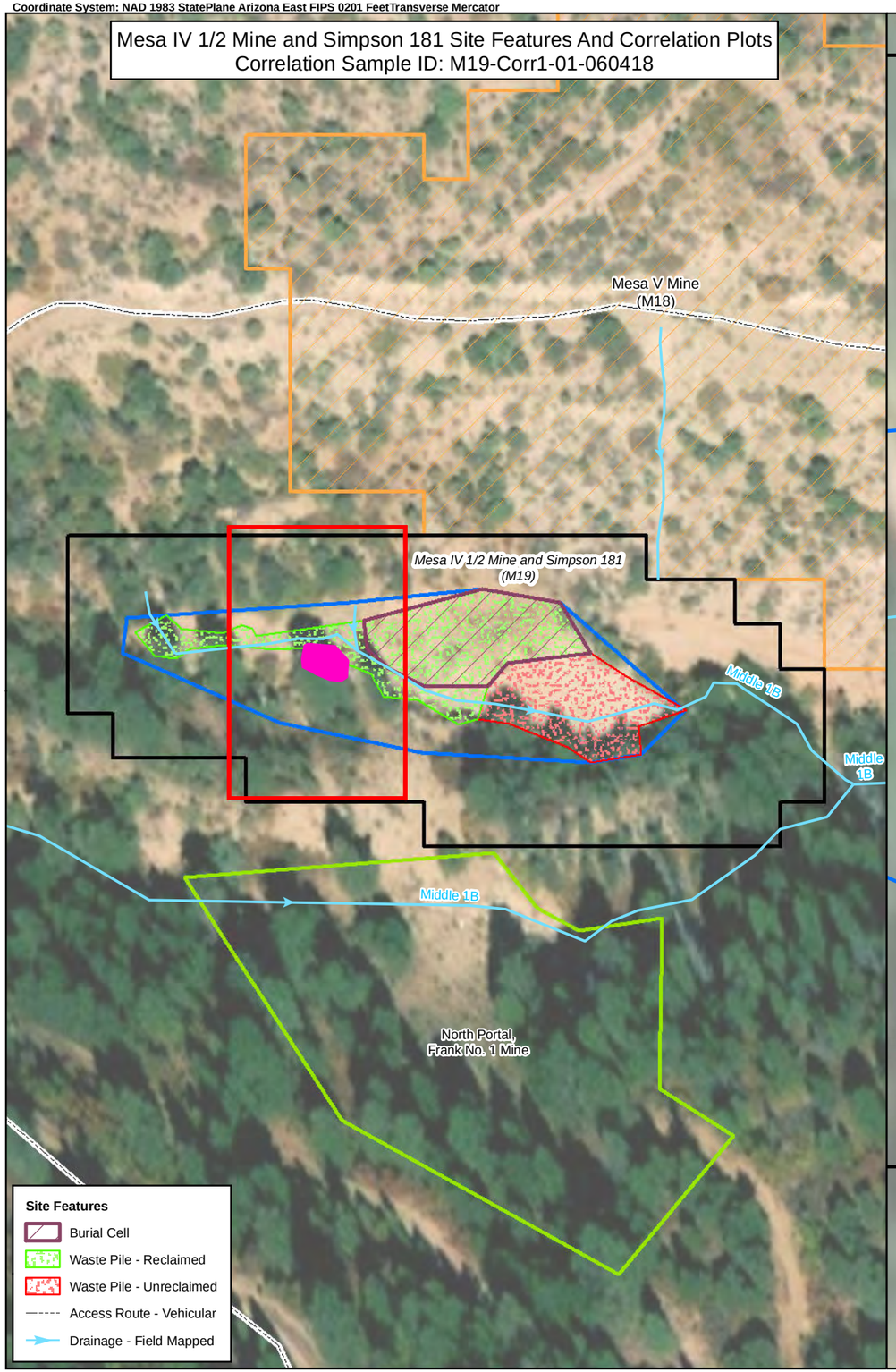
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-2

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV 1/2 Mine and Simpson 181 Site Features And Correlation Plots
Correlation Sample ID: M19-Corr1-01-060418



Mesa IV 1/2 Mine and Simpson 181 Correlation Gamma Radiation Survey
Correlation Sample ID: M19-Corr1-01-060418

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area
- Non-Tronox AUM Site

1 in = 100 ft

1:1,200

N W E S

0 50 100 200 Feet

MESA IV 1/2 MINE AND SIMPSON 181 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

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Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-3

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 1 Site Features And Correlation Plots Correlation Sample ID: M20-Corr1-01-061918

Middle 16

Mesa IV, Mine No. 2 (M21)

Mesa IV, Mine No. 3 (M22)

Mesa IV, Mine No. 1 (M20)

Site Features

- Closed Portal
- Closed Prospect
- Highwall - Reclaimed
- Highwall - Unreclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa IV, Mine No. 1 Correlation Gamma Radiation Survey Correlation Sample ID: M20-Corr1-01-061918

0 10 20 40 Feet

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 180 ft

1:2,160

N W E S

0 90 180 360 Feet

MESA IV, MINE NO. 1 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 1 OF 3

Prepared For:

Prepared By:

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Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-4

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Middle 16

Mesa IV, Mine No. 1 Site Features And Correlation Plots
Correlation Sample ID: M20-Corr2-01-061818

Mesa IV, Mine No. 2
(M21)

Mesa IV, Mine No. 3
(M22)

Mesa IV, Mine No. 1
(M20)

Site Features
- Closed Portal
- Closed Prospect
- Highwall - Reclaimed
- Highwall - Unreclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa IV, Mine No. 1 Correlation Gamma Radiation Survey
Correlation Sample ID: M20-Corr2-01-061818

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 180 ft

1:2,160

N W E S

0 90 180 360 Feet

MESA IV, MINE NO. 1 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 2 OF 3

Prepared For:

Prepared By:

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Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the geologic units Summerville, Entrada undifferentiated formation (Jse) 52% and the Morisson lower formation (Jml) 48%.

Figure No.: C1-2-5

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 1 Site Features And Correlation Plots
Correlation Sample ID: M20-Corr3-01-061918

Mesa IV, Mine No. 1 Correlation Gamma Radiation Survey
Correlation Sample ID: M20-Corr3-01-061918

Mesa IV, Mine No. 2 (M21)

Mesa IV, Mine No. 3 (M22)

Mesa IV, Mine No. 1 (M20)

Middle 16

Site Features
- Closed Portal
- Closed Prospect
- Highwall - Reclaimed
- Highwall - Unreclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 180 ft

1:2,160

N W E S

0 90 180 360 Feet

0 10 20 40 Feet

MESA IV, MINE NO. 1 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 3 OF 3

Prepared For:

Prepared By:

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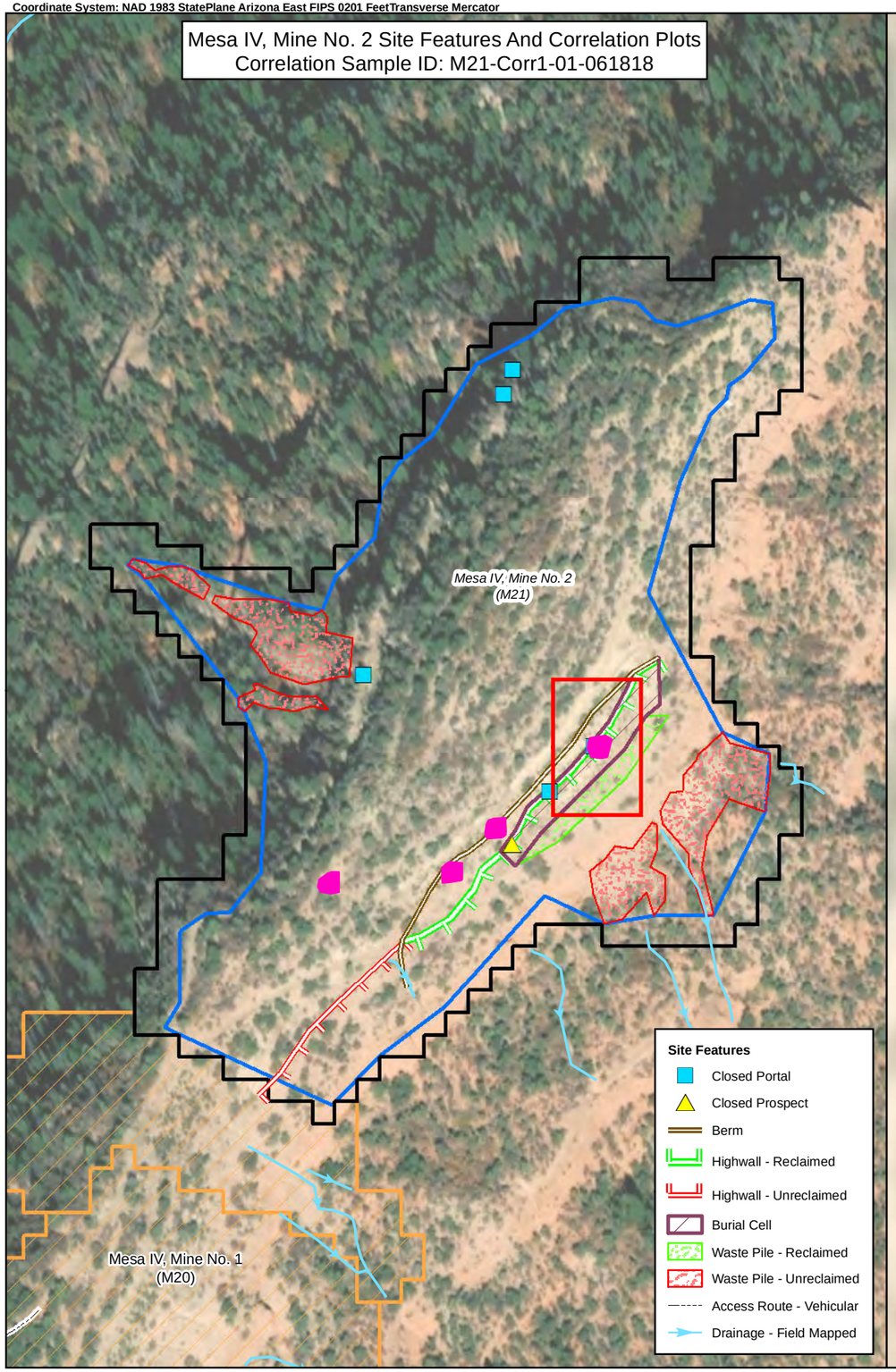
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	Date: 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic units.

Figure No.: C1-2-6

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 2 Site Features And Correlation Plots
Correlation Sample ID: M21-Corr1-01-061818



Mesa IV, Mine No. 2 Correlation Gamma Radiation Survey
Correlation Sample ID: M21-Corr1-01-061818

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 200 ft

1:2,400

N
W E
S

0 100 200 400 Feet

MESA IV, MINE NO. 2
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 2

Prepared For:

Prepared By:

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Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic units.

Figure No.: C1-2-7

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 2 Site Features And Correlation Plots

Mesa IV, Mine No. 2
(M21)

Mesa IV, Mine No. 1
(M20)

Site Features
- Closed Portal
- Closed Prospect
- Berm
- Highwall - Reclaimed
- Highwall - Unreclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa IV, Mine No. 2 Correlation Gamma Radiation Survey

M21-Corr2-01-061818

M21-Corr3-01-061818

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 200 ft

1:2,400

N W E S

0 100 200 400 Feet

MESA IV, MINE NO. 2 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 2 OF 2

Prepared For:

Prepared By:

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Oakland, CA 94612

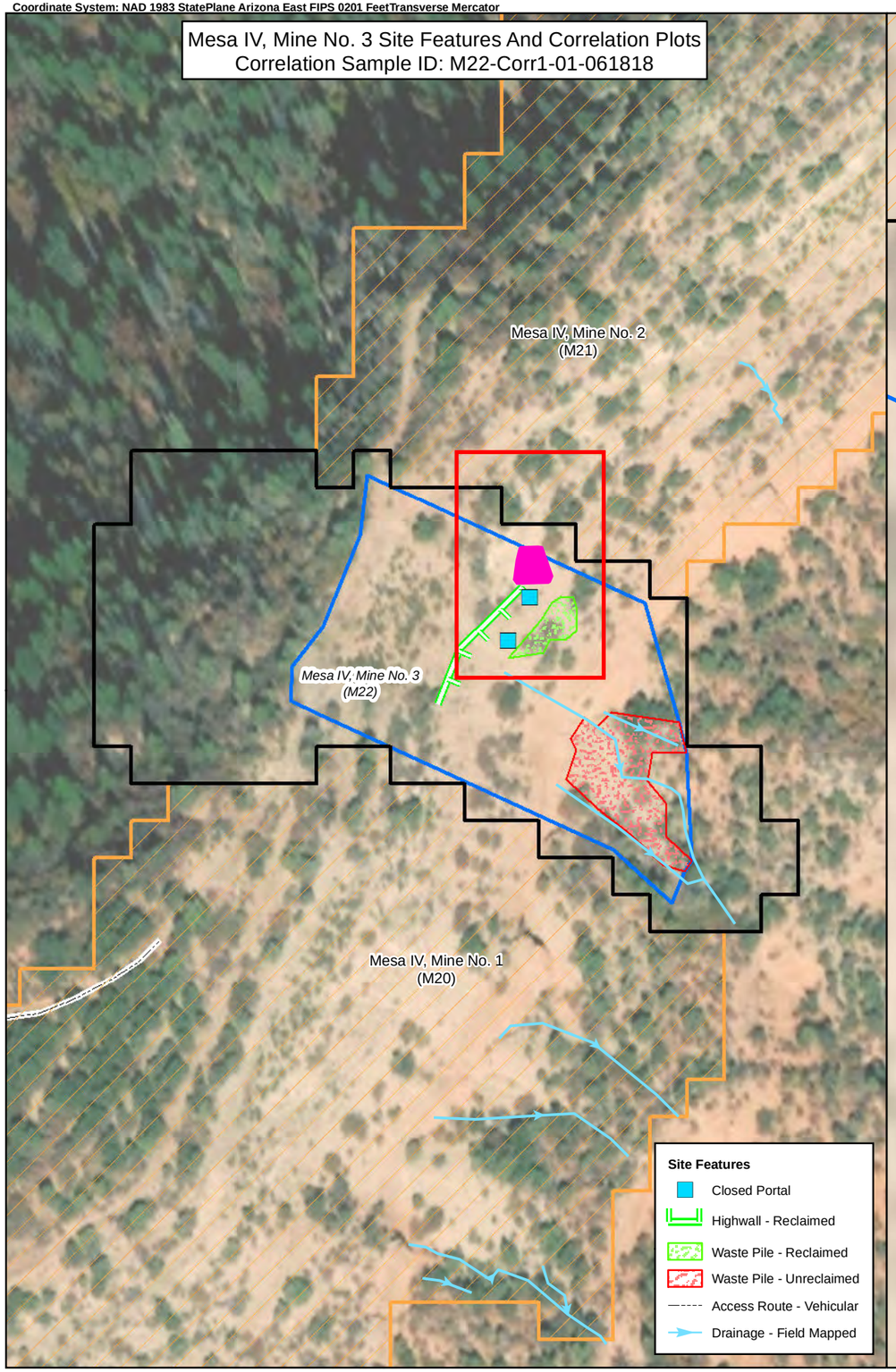
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

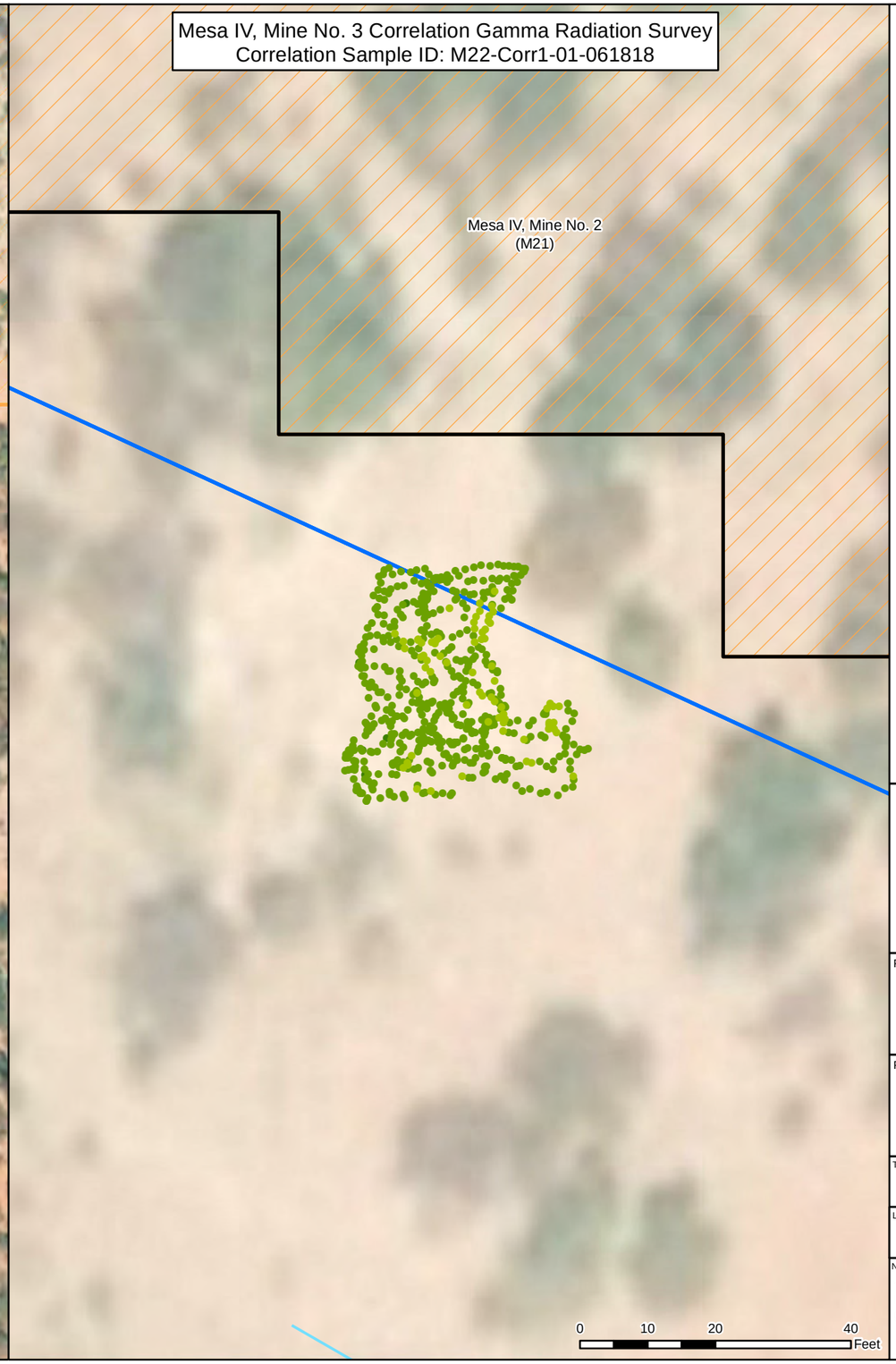
Figure No.: C1-2-8

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 3 Site Features And Correlation Plots
Correlation Sample ID: M22-Corr1-01-061818



Mesa IV, Mine No. 3 Correlation Gamma Radiation Survey
Correlation Sample ID: M22-Corr1-01-061818



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

MESA IV, MINE NO. 3
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

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Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-9

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Site Features And Correlation Plots
Correlation Sample ID: M27-Corr1-01-092518

BSA-29
(B29)

Middle 3B

Site Features
- Closed Portal
- Burial Cell
- Waste Pile - Reclaimed
- Mining Infrastructure
- Access Route - Vehicular
- Drainage - Field Mapped

Correlation Gamma Radiation Survey
Correlation Sample ID: M27-Corr1-01-092518

Middle 3B

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Other Survey Area

1 in = 200 ft

1:2,400

N W E S

0 100 200 400 Feet

MESA II, MINE NO. 1 & 2, P-21
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 2

Prepared For:

Prepared By:

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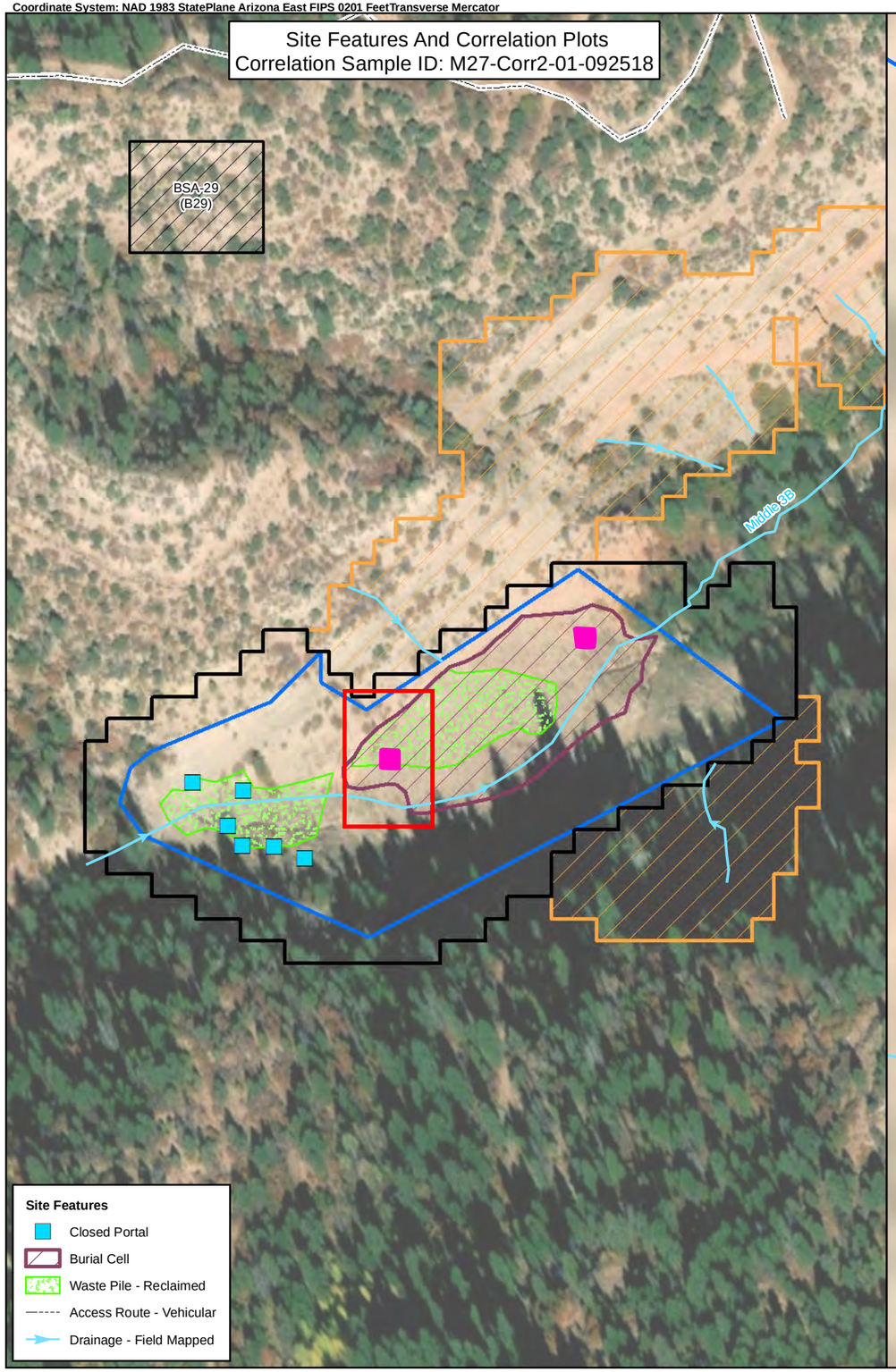
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-10

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Site Features And Correlation Plots
Correlation Sample ID: M27-Corr2-01-092518



Site Features
- Closed Portal
- Burial Cell
- Waste Pile - Reclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Correlation Gamma Radiation Survey
Correlation Sample ID: M27-Corr2-01-092518

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Other Survey Area

1 in = 200 ft

1:2,400

N
W E
S

0 100 200 400 Feet

MESA II, MINE NO. 1 & 2, P-21 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 2 OF 2

Prepared For:

Prepared By:

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Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-11

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425

Background Location

Access Route - Foot

*Correlation plot lies within the Summerville, Todilto, Entrada undifferentiated formation (Jste) geologic unit.

Prepared for: U.S. EPA Region 9

Prepared By:

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BSA-32 BACKGROUND SITE CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-2-12
Location: COVE CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Knife Edge Mesa Mine Site Features And Correlation Plots
Correlation Sample ID: M33-Corr3-01-092618

Knife Edge Mesa Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M33-Corr3-01-092618

Site Features
- Open Portal
- Waste Pile - Unreclaimed

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 90 ft

1:1,080

0 45 90 180 Feet

N W E S

0 10 20 40 Feet

KNIFE EDGE MESA MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 1 OF 3

Prepared For:

Prepared By:

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Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Todilto, Entrada undifferentiated formation (Jste) geologic unit.

Figure No.: C1-2-13

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Knife Edge Mesa Mine Site Features And Correlation Plots
Correlation Sample ID: M33-Corr2-01-092618

Knife Edge Mesa Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M33-Corr2-01-092618

Site Features
- Open Portal
- Waste Pile - Unreclaimed

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 90 ft

1:1,080

N W E S

0 45 90 180 Feet

0 10 20 40 Feet

KNIFE EDGE MESA MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 2 OF 3

Prepared For:

Prepared By:

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Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Todilto, Entrada undifferentiated formation (Jste) geologic unit.

Figure No.: C1-2-14

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Knife Edge Mesa Mine Site Features And Correlation Plots
Correlation Sample ID: M33-Corr1-01-092618

Knife Edge Mesa Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M33-Corr1-01-092618

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

Site Features

- Open Portal
- Waste Pile - Unreclaimed

1 in = 90 ft

1:1,080

N W E S

0 45 90 180 Feet

0 10 20 40 Feet

KNIFE EDGE MESA MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 3 OF 3

Prepared For:

Prepared By:

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Oakland, CA 94612

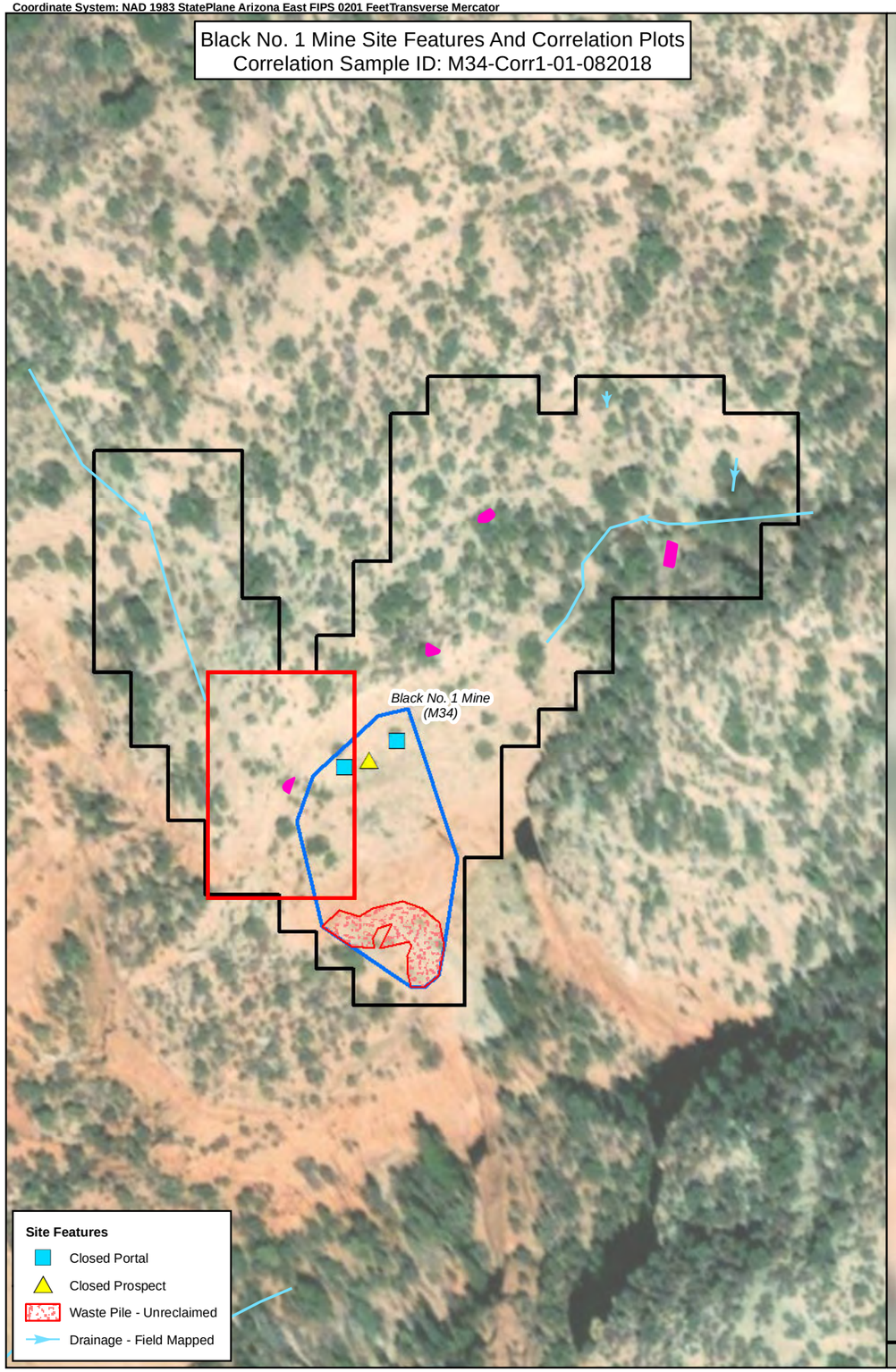
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Todilto, Entrada undifferentiated formation (Jste) geologic unit.

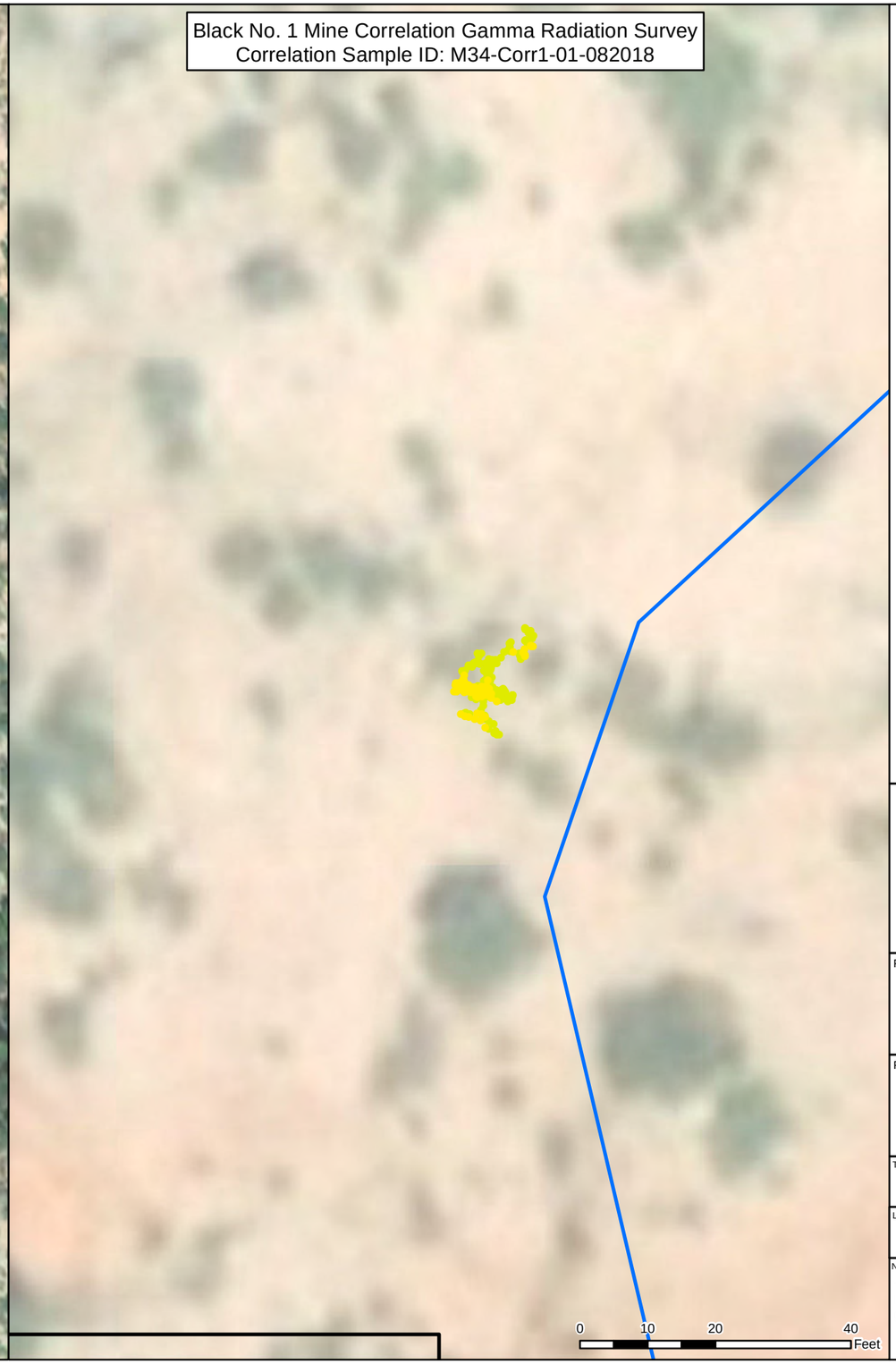
Figure No.: C1-2-15

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Black No. 1 Mine Site Features And Correlation Plots
Correlation Sample ID: M34-Corr1-01-082018



Black No. 1 Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M34-Corr1-01-082018



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

BLACK NO. 1 MINE
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-16

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Black No. 1 Mine Site Features And Correlation Plots

Black No. 1 Mine
(M34)

Site Features
- Closed Portal
- Closed Prospect
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Black No. 1 Mine Correlation Gamma Radiation Survey

M34-Corr2-01-082018

M34-Corr3-01-082018

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

BLACK NO. 1 MINE
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plots lie within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-17

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Black No. 1 Mine Site Features And Correlation Plots
Correlation Sample ID: M34-Corr4-01-082018

Black No. 1 Mine
(M34)

Site Features
- Closed Portal
- Closed Prospect
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Black No. 1 Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M34-Corr4-01-082018

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

BLACK NO. 1 MINE
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 3 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

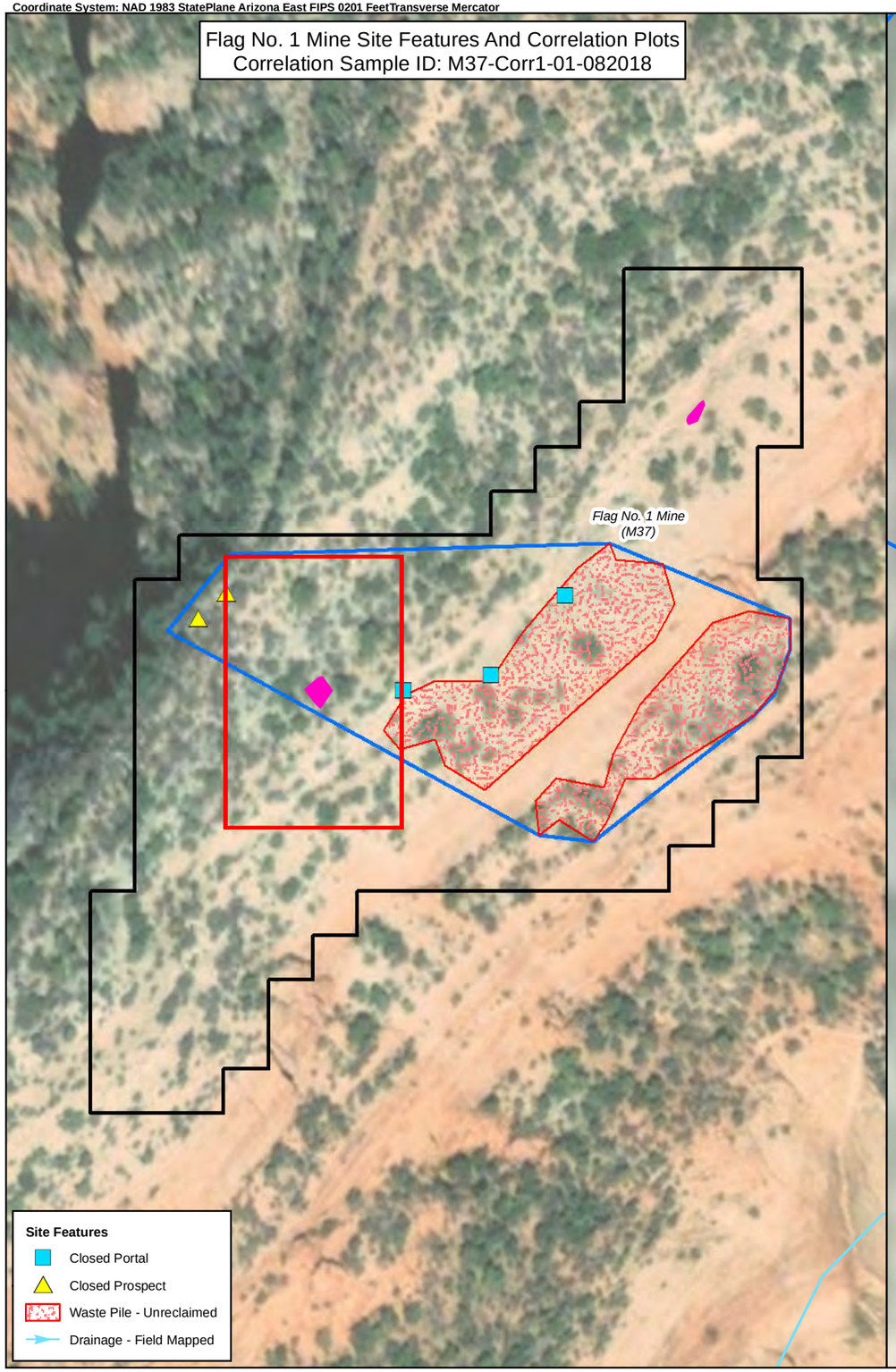
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-18

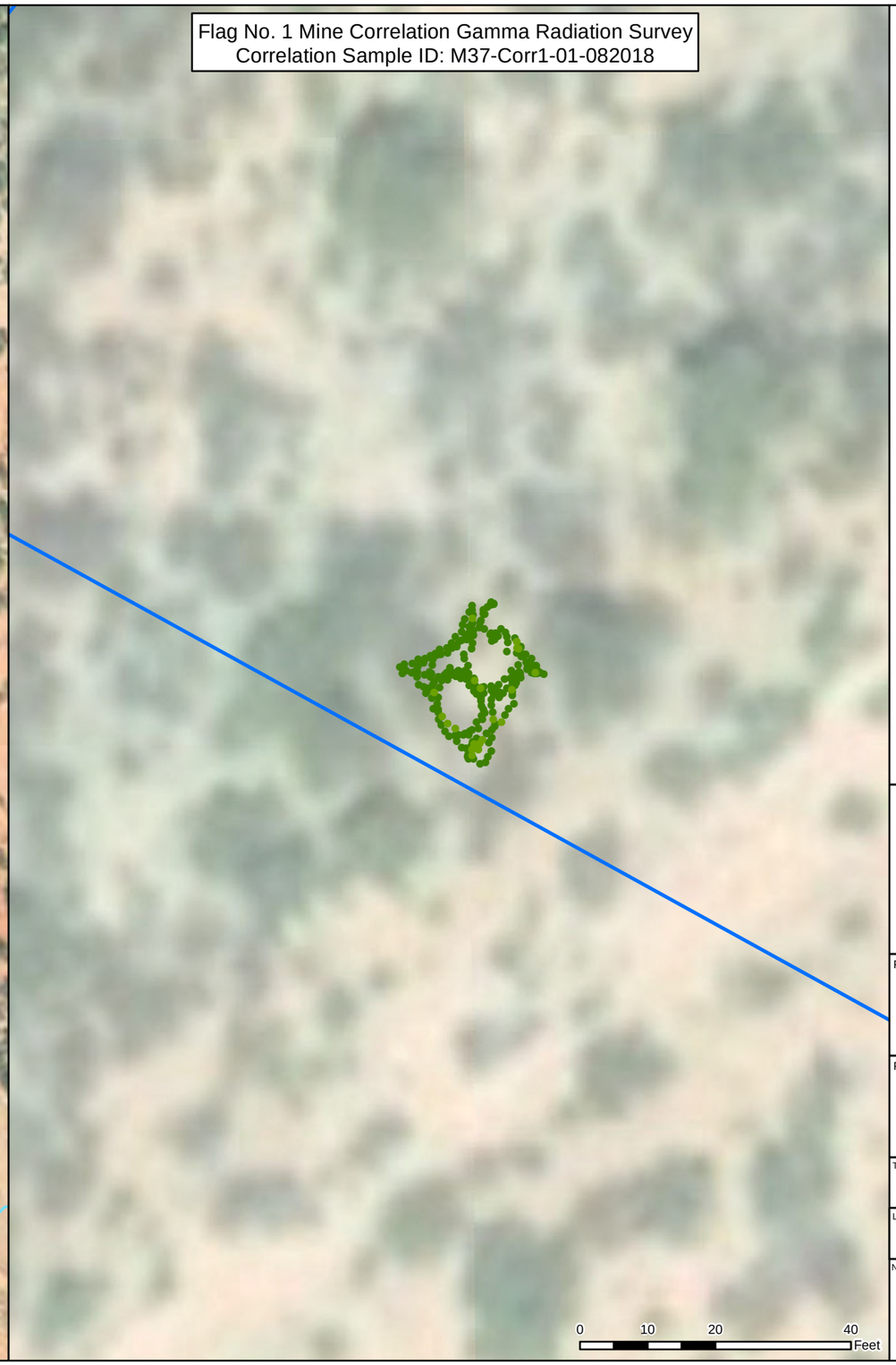
Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Flag No. 1 Mine Site Features And Correlation Plots
Correlation Sample ID: M37-Corr1-01-082018



Site Features
- Closed Portal
- Closed Prospect
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Flag No. 1 Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M37-Corr1-01-082018



Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 100 ft

1:1,200

N
W E
S

0 50 100 200 Feet

FLAG NO. 1 MINE
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

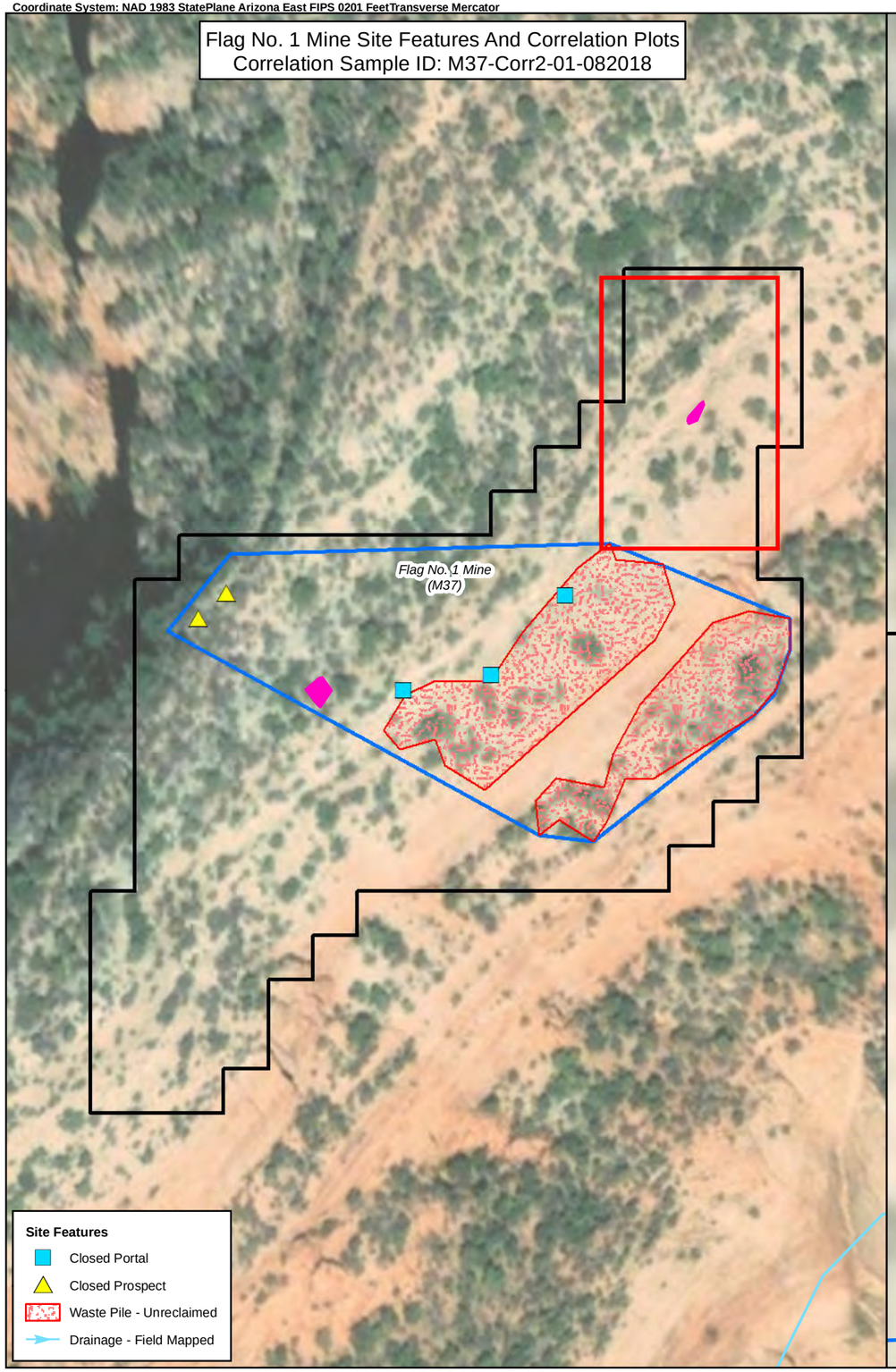
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 6/9/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-19

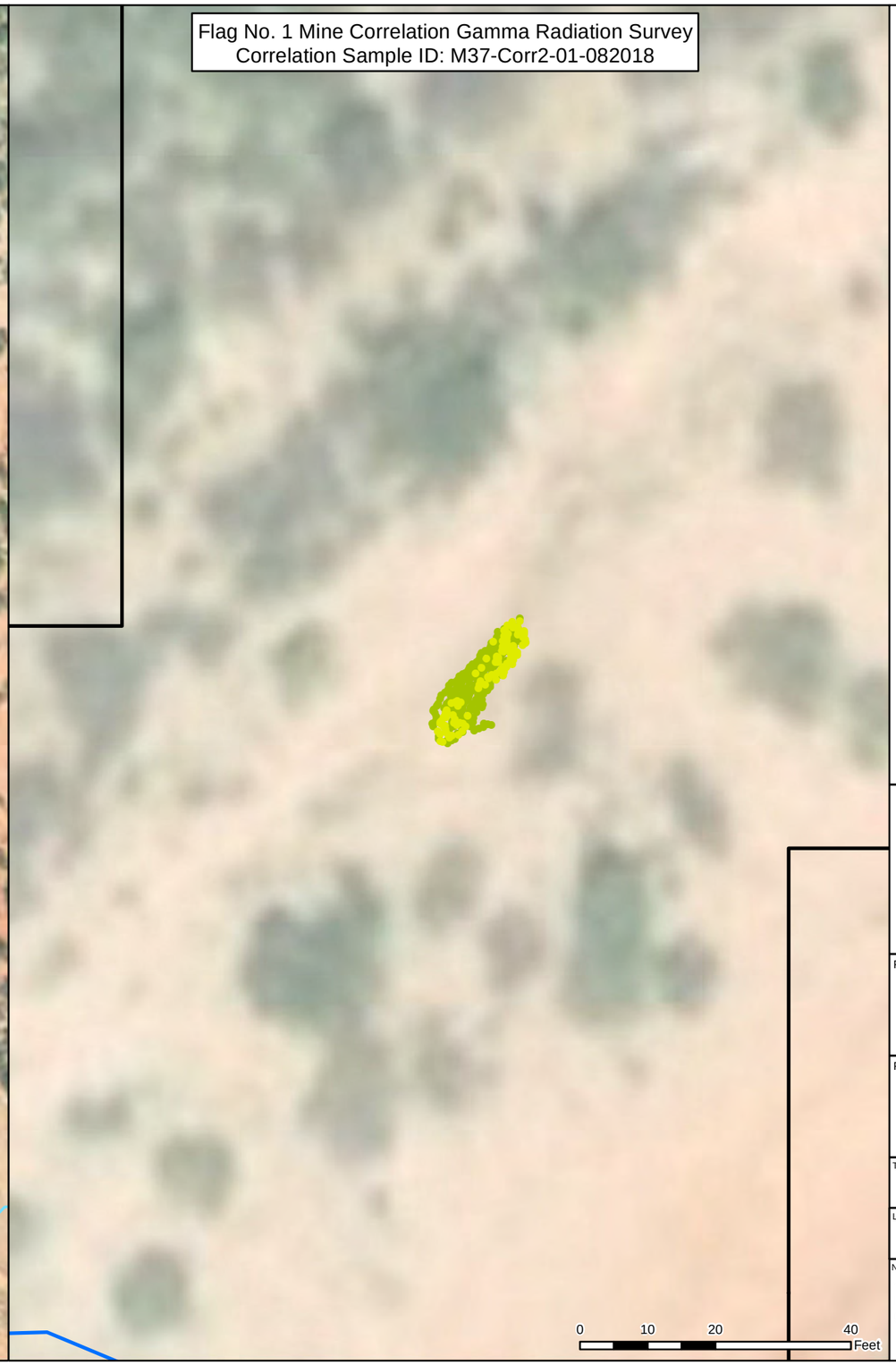
Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Flag No. 1 Mine Site Features And Correlation Plots
Correlation Sample ID: M37-Corr2-01-082018



Site Features
- Closed Portal
- Closed Prospect
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Flag No. 1 Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M37-Corr2-01-082018



Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 100 ft

1:1,200

N
W E
S

0 50 100 200 Feet

FLAG NO. 1 MINE
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 6/9/2019

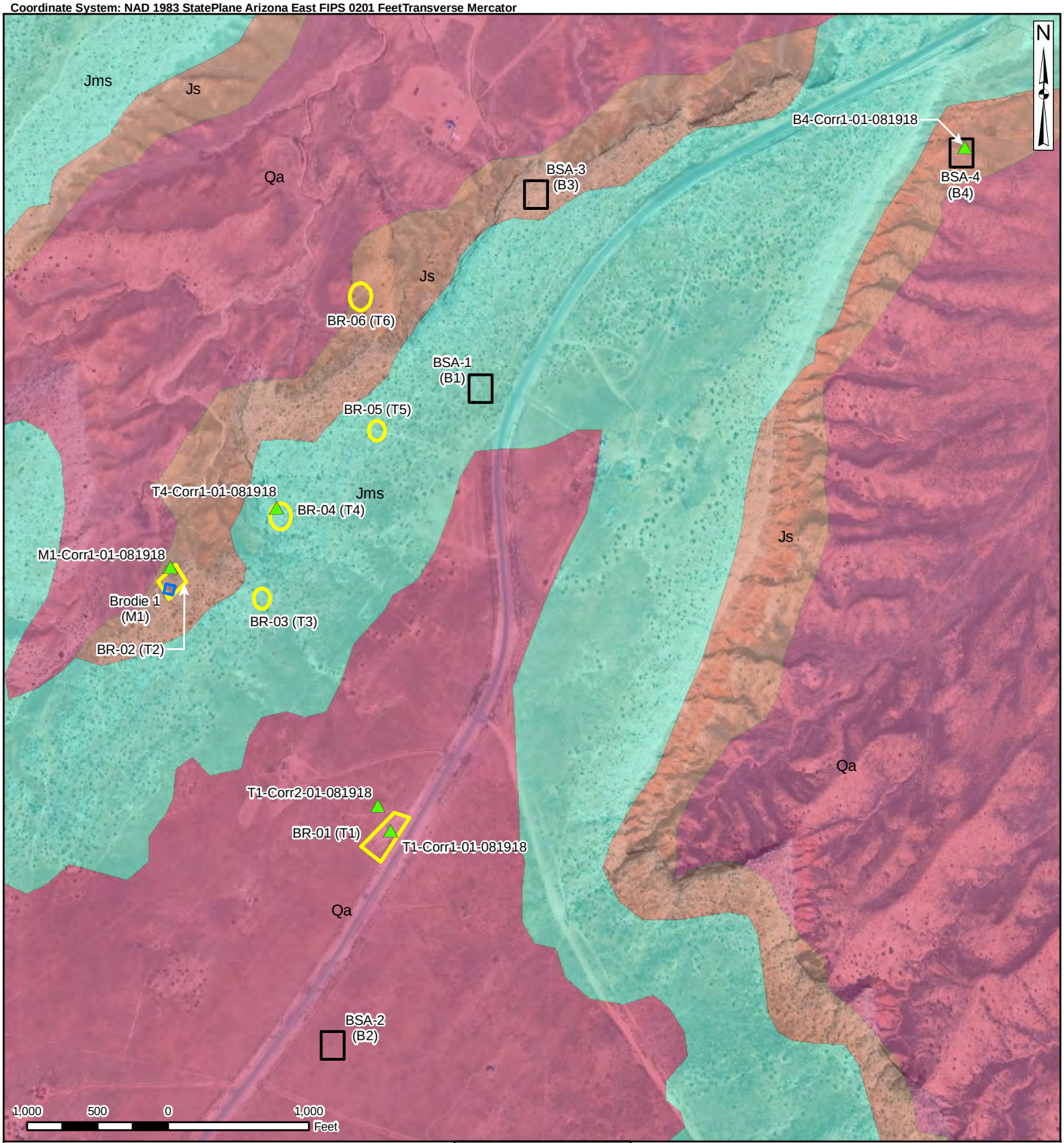
Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-2-20

ATTACHMENT C1-3

TSE TAH REGION CORRELATION MAPS AND SCAN DATA

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Geologic Units*

- Alluvium - Qa
- Morrison Formation Salt Wash Member - Jms
- Summerville Formation - Js

- Correlation Sampling Location
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Background Location

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for: USEPA Region 9

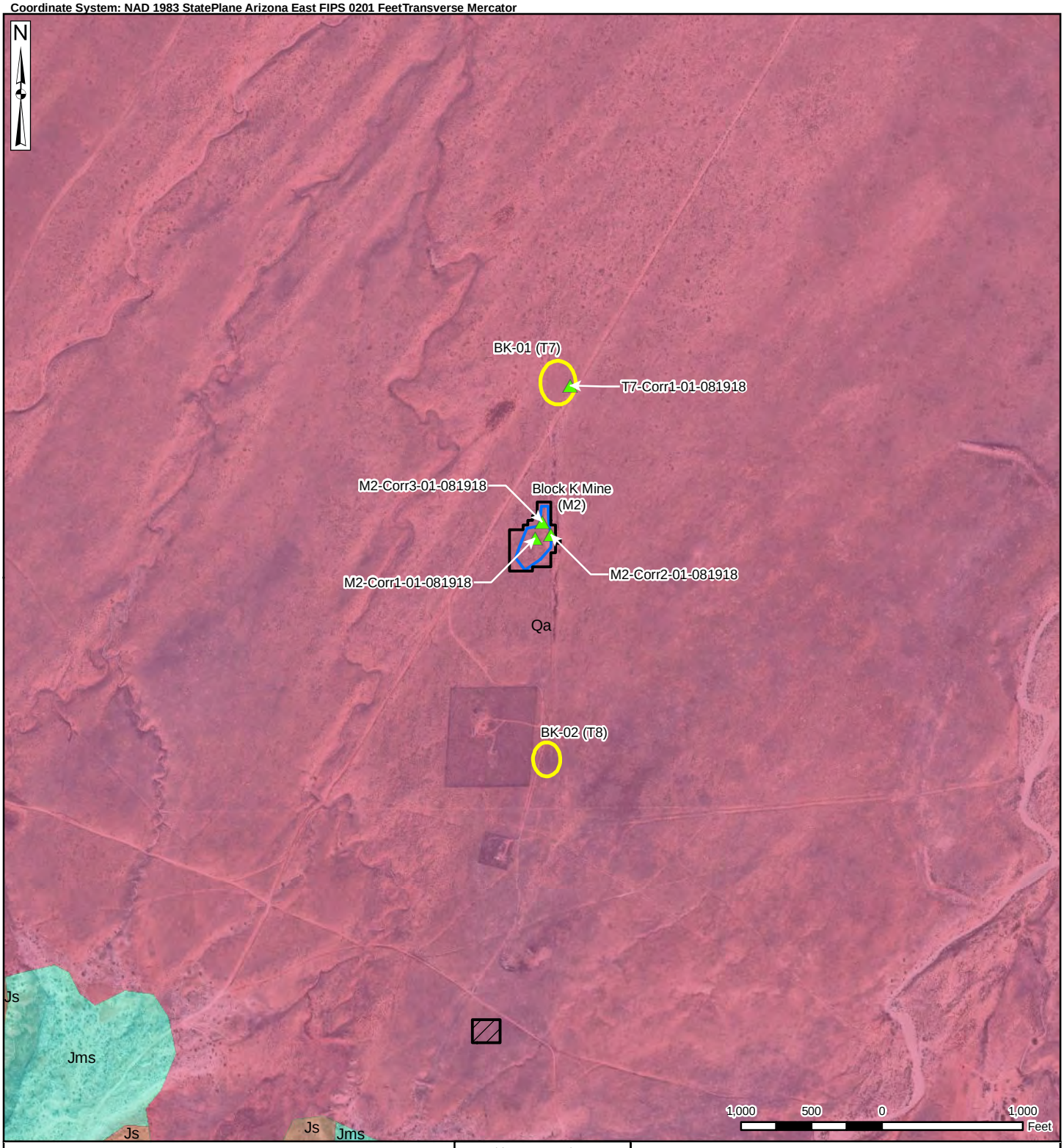
Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

TSE TAH REGION GROUP A CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-3-1
Location: SWEETWATER CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Geologic Units*

- Alluvium - Qa
- Morrison Formation Salt Wash Member - Jms
- Summerville Formation - Js

- Correlation Sampling Location
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Related Survey Area
- Background Location

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for: USEPA Region 9

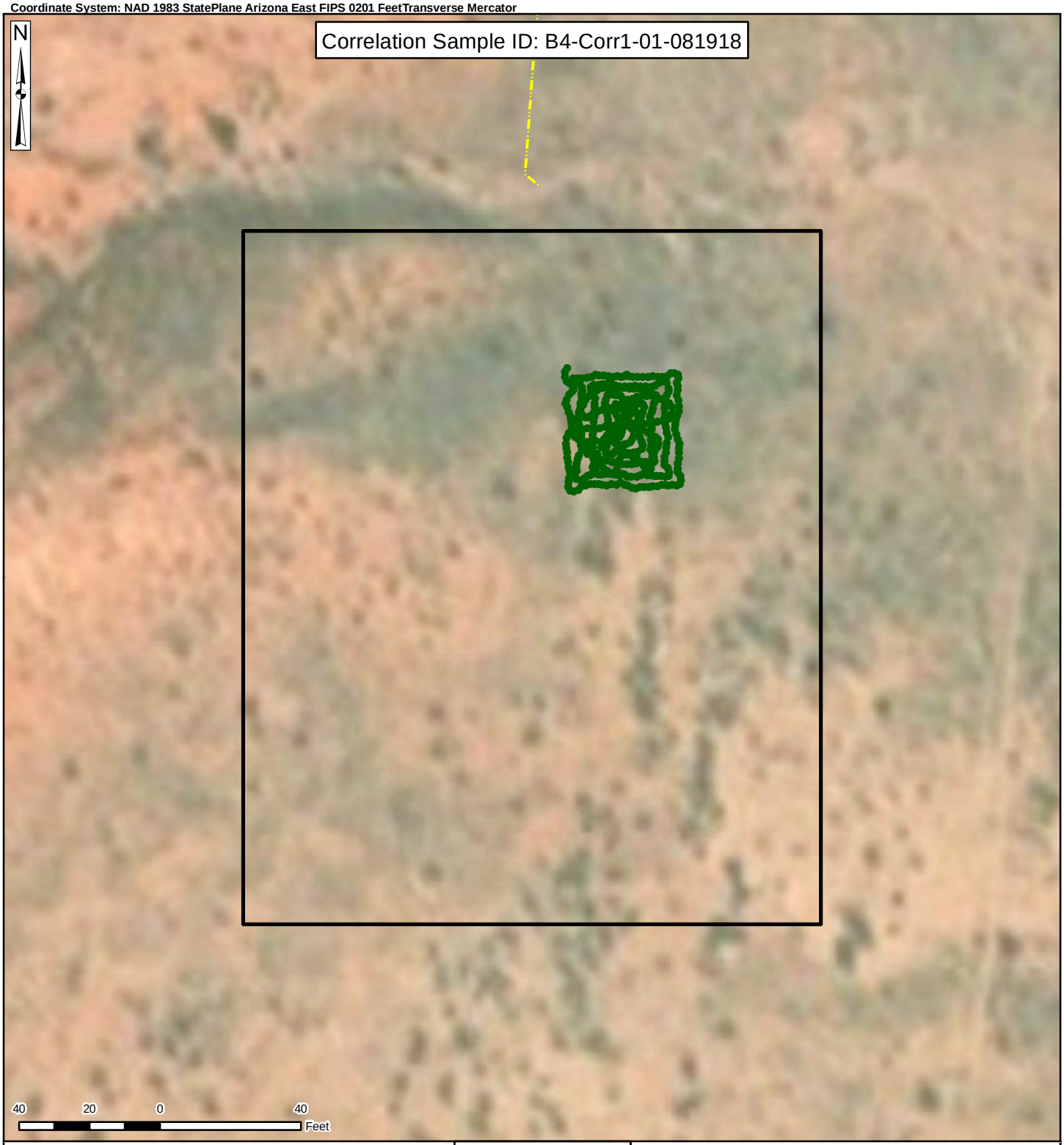
Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

TSE TAH REGION GROUP B CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-3-2
Location: TEEC NOS POS CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425

Background Location

Access Route - Foot

*Correlation plot lies within Summerville (Js) geologic unit and used in development of the Tse Tah region correlation.

Prepared for: U.S. EPA Region 9

Prepared By:

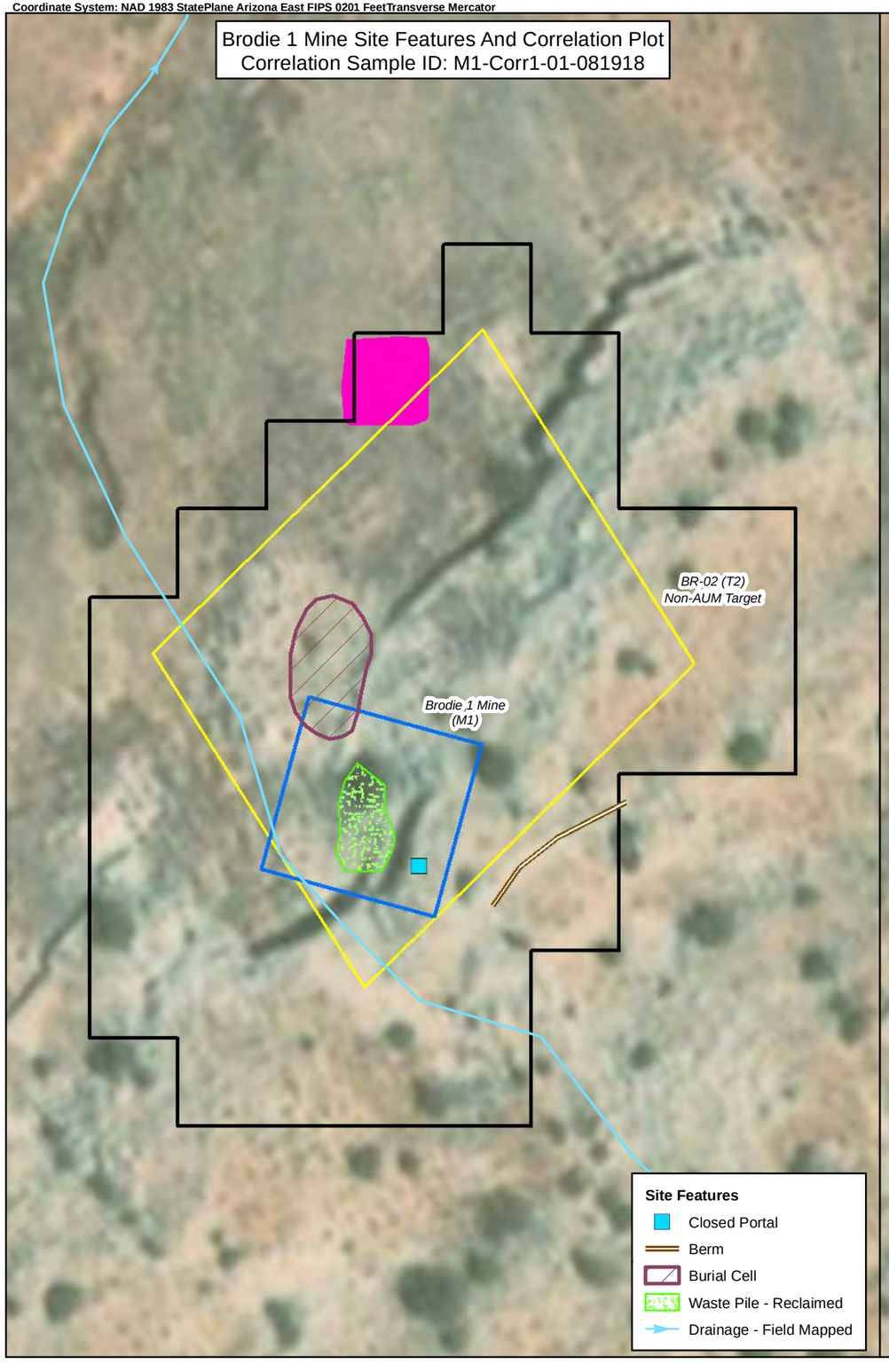
TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

BSA-4 BACKGROUND SITE CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP

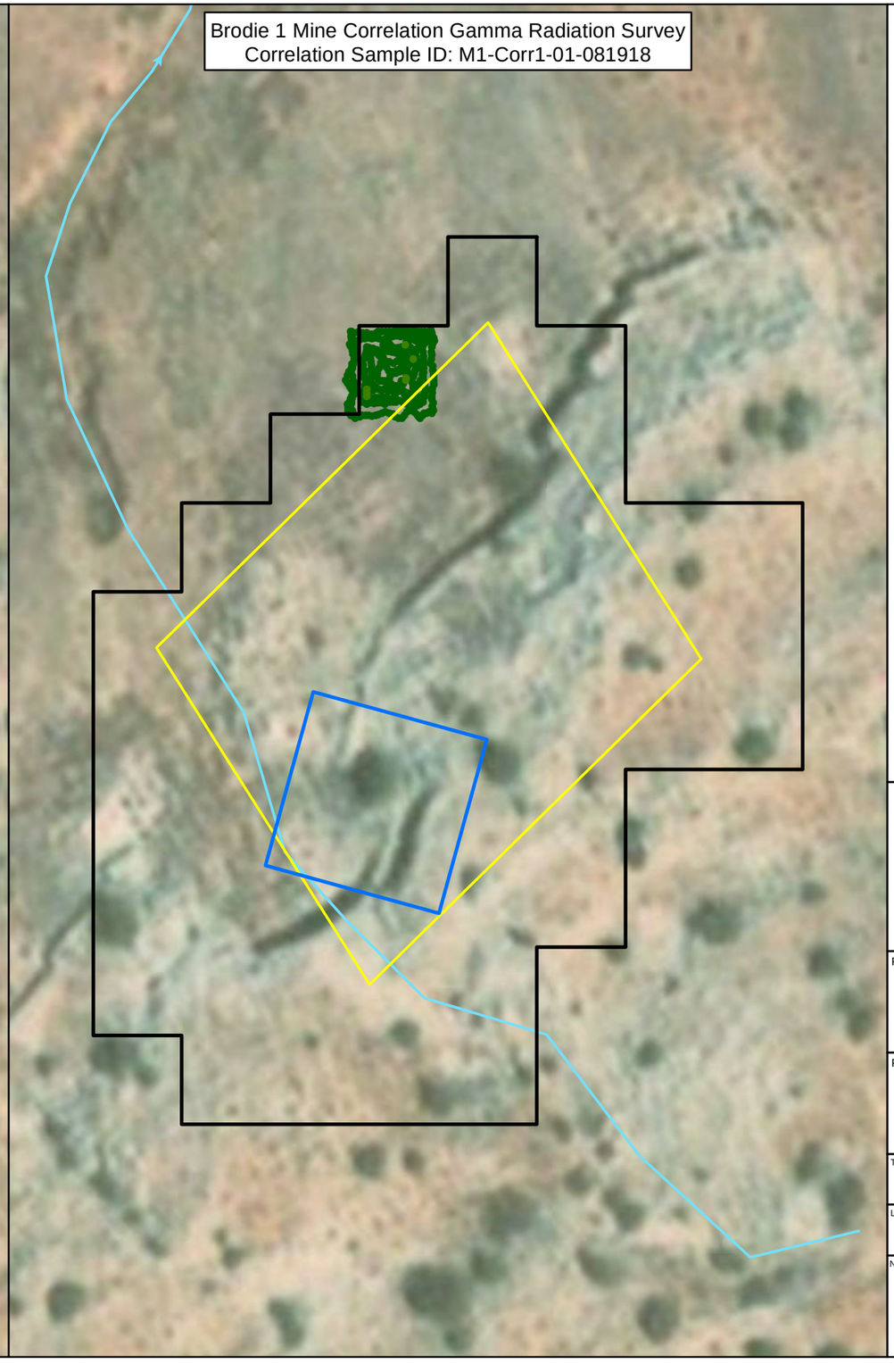
Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-3-3
Location: SWEETWATER CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Brodie 1 Mine Site Features And Correlation Plot
Correlation Sample ID: M1-Corr1-01-081918



Brodie 1 Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M1-Corr1-01-081918



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Non-AUM Target Site Boundary

1 in = 50 ft

1:600

N W E S

0 25 50 100 Feet

BRODIE 1 MINE
CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: SWEETWATER CHAPTER NAVAJO NATION	Date: 5/24/2019

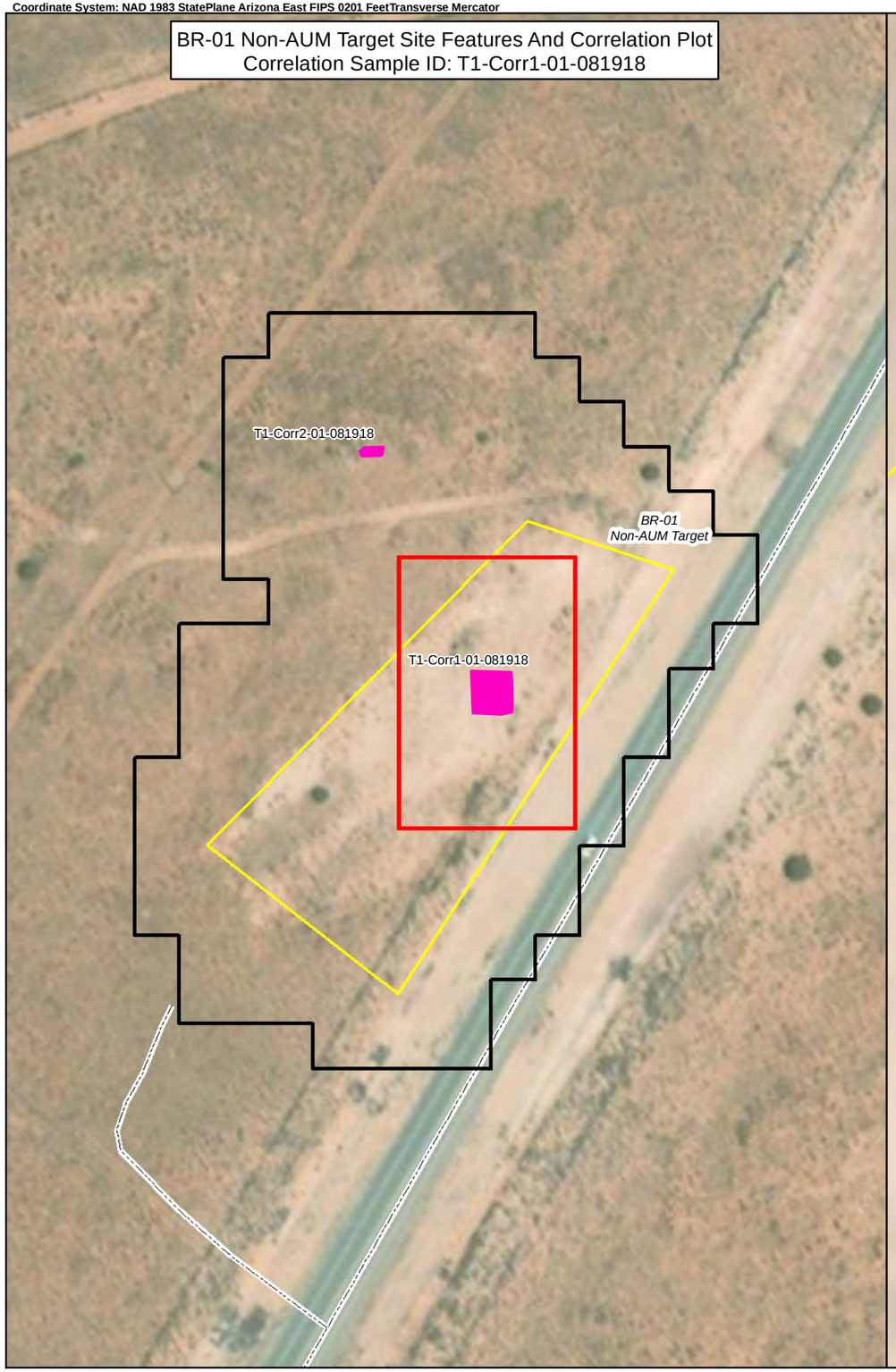
Notes:

*Correlation plot lies within Summerville (Js) geologic unit and used in development of the Tse Tah region correlation.

Figure No.: C1-3-4

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

BR-01 Non-AUM Target Site Features And Correlation Plot
Correlation Sample ID: T1-Corr1-01-081918



BR-01 Non-AUM Target Correlation Gamma Radiation Survey
Correlation Sample ID: T1-Corr1-01-081918

Gamma Reading (cpm)

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Access Route - Vehicular

1 in = 100 ft

1:1,200

N
W E
S

0 50 100 200 Feet

BR-01 NON-AUM TARGET CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP INSET 1 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: SWEETWATER CHAPTER NAVAJO NATION	**Date:** 5/24/2019

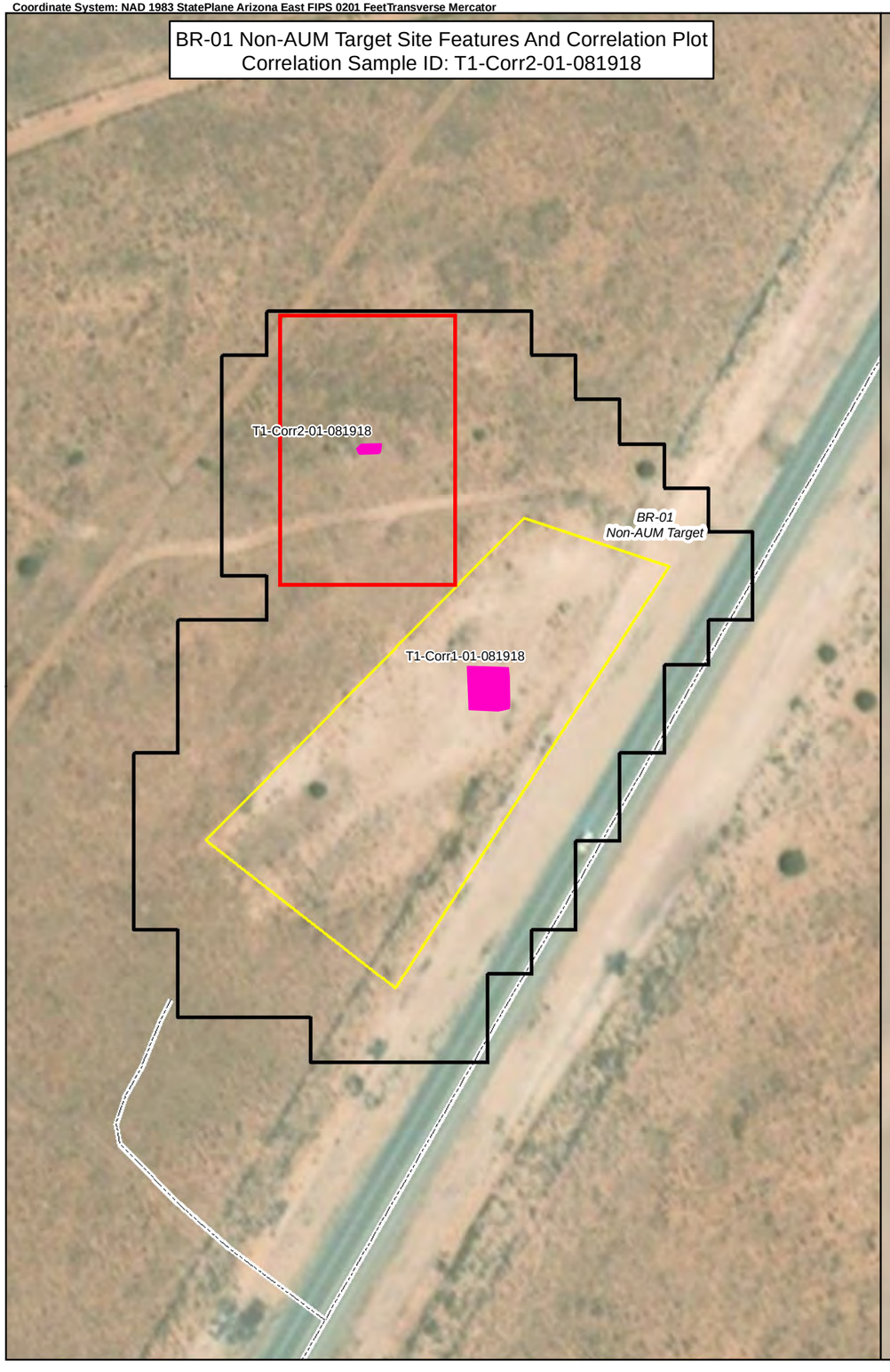
Notes:

*Correlation plot lies within Summerville (Js) geologic unit and used in development of the Tse Tah region correlation.

Figure No.: C1-3-5

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

BR-01 Non-AUM Target Site Features And Correlation Plot
Correlation Sample ID: T1-Corr2-01-081918



BR-01 Non-AUM Target Correlation Gamma Radiation Survey
Correlation Sample ID: T1-Corr2-01-081918

Gamma Reading (cpm)

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- Survey Area Boundary
- Access Route - Vehicular

1 in = 100 ft

1:1,200

N
W E
S

0 50 100 200 Feet

BR-01 NON-AUM TARGET CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP INSET 2 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: SWEETWATER CHAPTER NAVAJO NATION	Date: 5/24/2019

Notes:

*Correlation plot lies within Summerville (Js) geologic unit and used in development of the Tse Tah region correlation.

Figure No.: C1-3-6

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

BR-04 Non-AUM Target Site Features And Correlation Plot
Correlation Sample ID: T4-Corr1-01-081918

BR-04
Non-AUM Target

BR-04 Non-AUM Target Correlation Gamma Radiation Survey
Correlation Sample ID: T4-Corr1-01-081918

0 10 20 40 Feet

Gamma Reading (cpm)

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Access Route - Foot
- Drainage Legend

1 in = 100 ft

1:1,200

N W E S

0 50 100 200 Feet

BR-04 NON-AUM TARGET CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: SWEETWATER CHAPTER NAVAJO NATION	Date: 5/24/2019

Notes:

*Correlation plot lies within Summerville (Js) geologic unit and used in development of the Tse Tah region correlation.

Figure No.: C1-3-7

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Block K Mine Site Features And Correlation Plots

M2-Corr3-01-081918

M2-Corr2-01-081918

M2-Corr1-01-081918

Block K Mine (M2)

Site Features

- Closed Portal
- Berm
- Burial Cell
- Waste Pile - Reclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Block K Mine Correlation Gamma Radiation Survey

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

0 15 30 60 Feet

1 in = 70 ft

1:840

N W E S

0 35 70 140 Feet

BLOCK K MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: TEEC NOS POS CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:

*Correlation plot lies within Summerville (Js) geologic unit and used in development of the Tse Tah region correlation.

Figure No.: C1-3-8

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

BK-01 Site Features And Correlation Plots
Correlation Sample ID: T7-Corr1-01-081918

BK-01
Non-AUM Target

BK-01 Correlation Gamma Radiation Survey
Correlation Sample ID: T7-Corr1-01-081918

0 10 20 40 Feet

Gamma Reading (cpm)

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Access Route - Vehicular

1 in = 60 ft

1:720

N W E S

0 30 60 120 Feet

BK-01 NON-AUM TARGET CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: TEEC NOS POS CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:

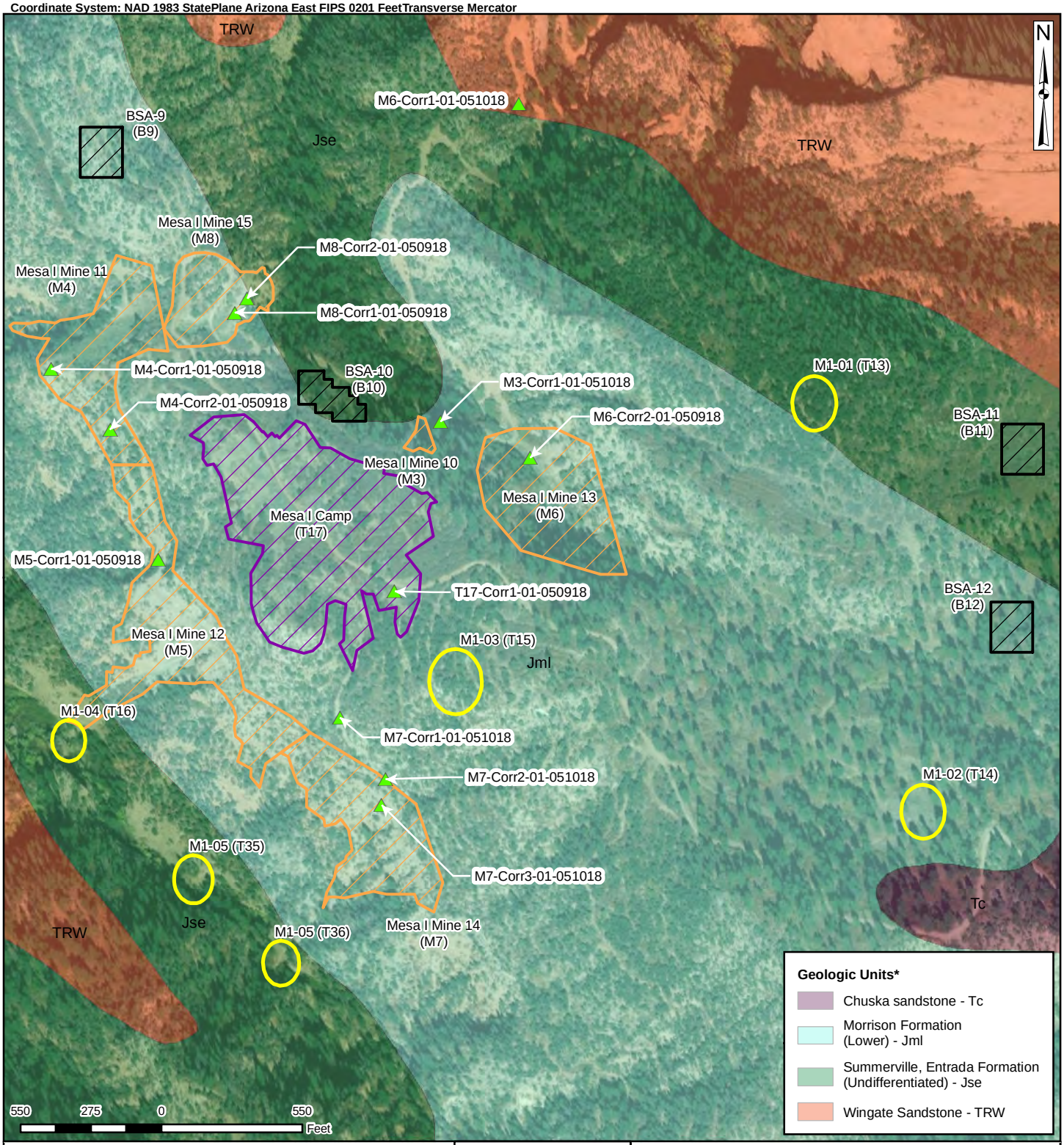
*Correlation plot lies within Summerville (Js) geologic unit and used in development of the Tse Tah region correlation.

Figure No.: C1-3-9

ATTACHMENT C1-4

GROUP D CORRELATION MAPS AND SCAN DATA

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Correlation Sampling Location

Tronox AUM Site Boundary

Non-AUM Target Site Boundary

AUM Related Site Boundary

Background Sampling Location

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for: U.S. EPA Region 9

Prepared By:

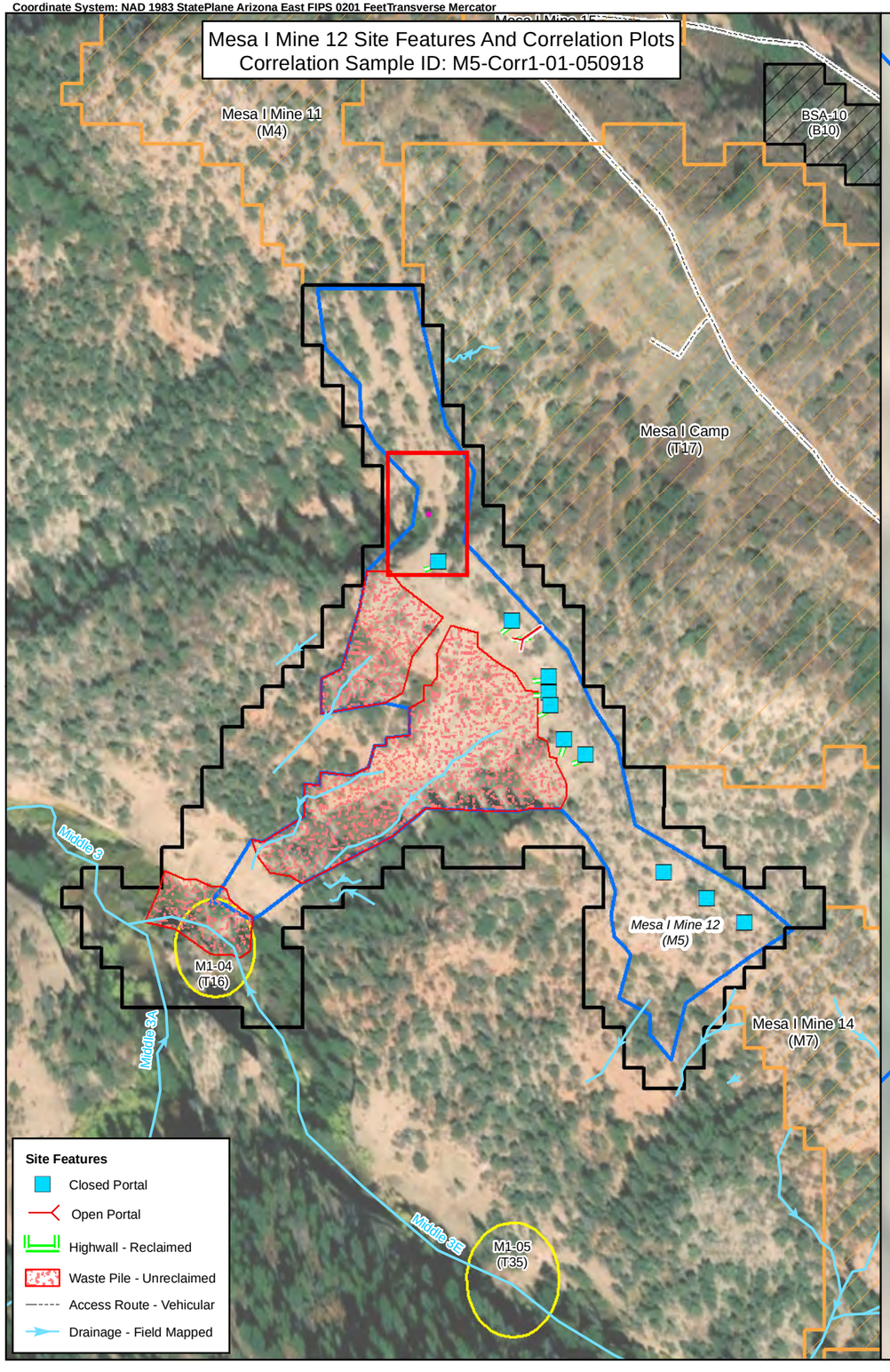
TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

GROUP D
CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-4-1
Location: COVE CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 12 Site Features And Correlation Plots
Correlation Sample ID: M5-Corr1-01-050918



Mesa I Mine 12 Correlation Gamma Radiation Survey
Correlation Sample ID: M5-Corr1-01-050918

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 220 ft

1:2,640

N
W E
S

0 110 220 440 Feet

MESA I MINE 12
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

Figure No.: C1-4-2

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 10 Site Features And Correlation Plots
Correlation Sample ID: M3-Corr1-01-051018

Mesa I Mine 13
(M6)

Mesa I Mine 10
(M3)

Mesa I Camp
(T17)

Site Features
- Closed Portal
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Mine 10 Correlation Gamma Radiation Survey
Correlation Sample ID: M3-Corr1-01-051018

Mesa I Mine 13
(M6)

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area
- Access Route - Vehicular

1 in = 60 ft

1:720

N W E S

0 30 60 120 Feet

MESA I MINE 10
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

Figure No.: C1-4-3

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 11 Site Features And Correlation Plots
Correlation Sample ID: M4-Corr2-01-050918

Mesa I Mine 15
(M8)

Mesa I Mine 11
(M4)

Mesa I Camp
(T17)

Mesa I Mine 12
(M5)

Site Features
- Closed Portal
- Berm
- Highwall - Reclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Mine 11 Correlation Gamma Radiation Survey
Correlation Sample ID: M4-Corr2-01-050918

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 130 ft

1:1,560

N W E S

0 65 130 260 Feet

MESA I MINE 11
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

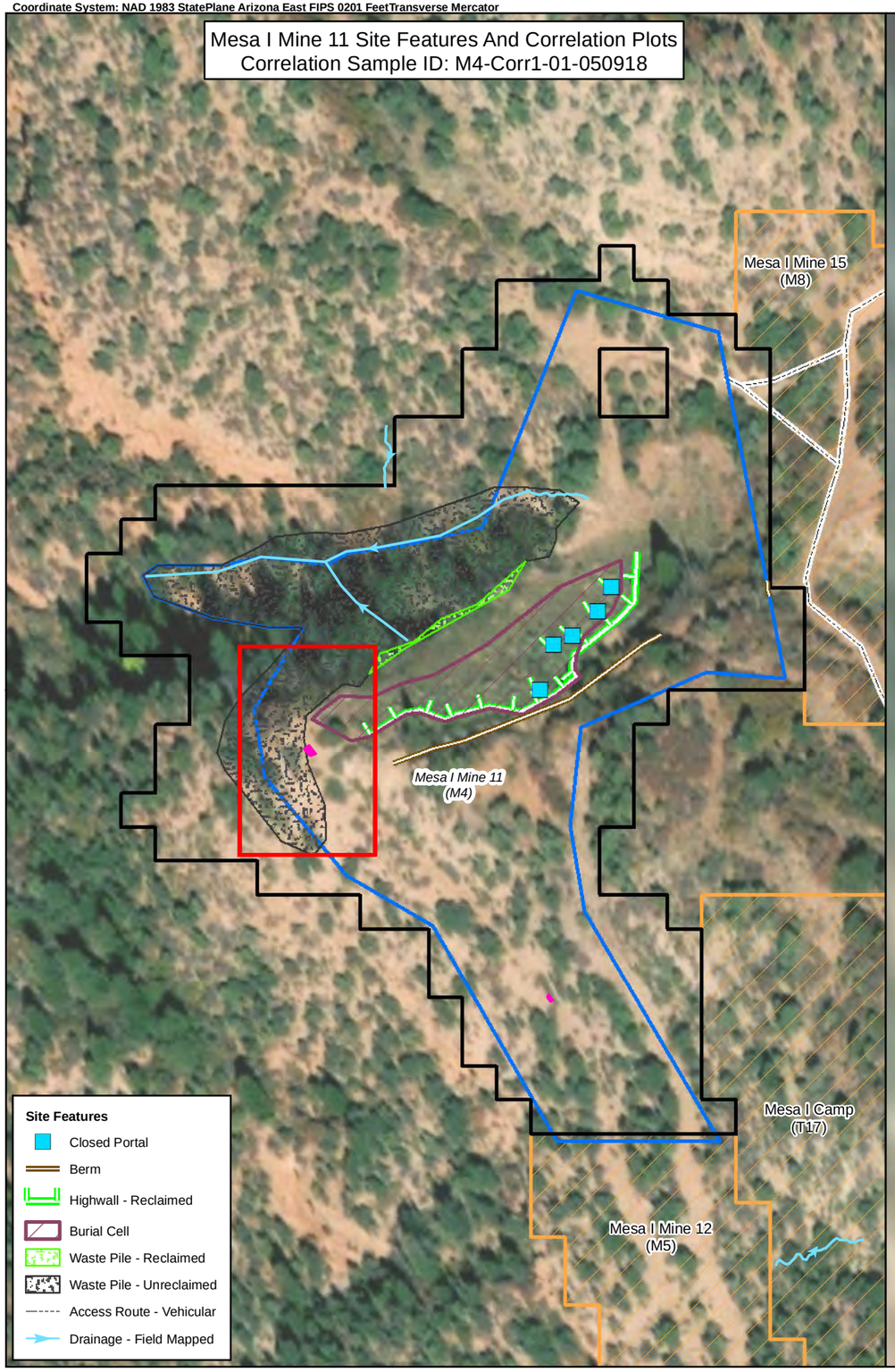
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

Figure No.: C1-4-4

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 11 Site Features And Correlation Plots
Correlation Sample ID: M4-Corr1-01-050918



Site Features
- Closed Portal
- Berm
- Highwall - Reclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Mine 11 Correlation Gamma Radiation Survey
Correlation Sample ID: M4-Corr1-01-050918

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 130 ft

1:1,560

N
W E
S

0 65 130 260 Feet

MESA I MINE 11
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

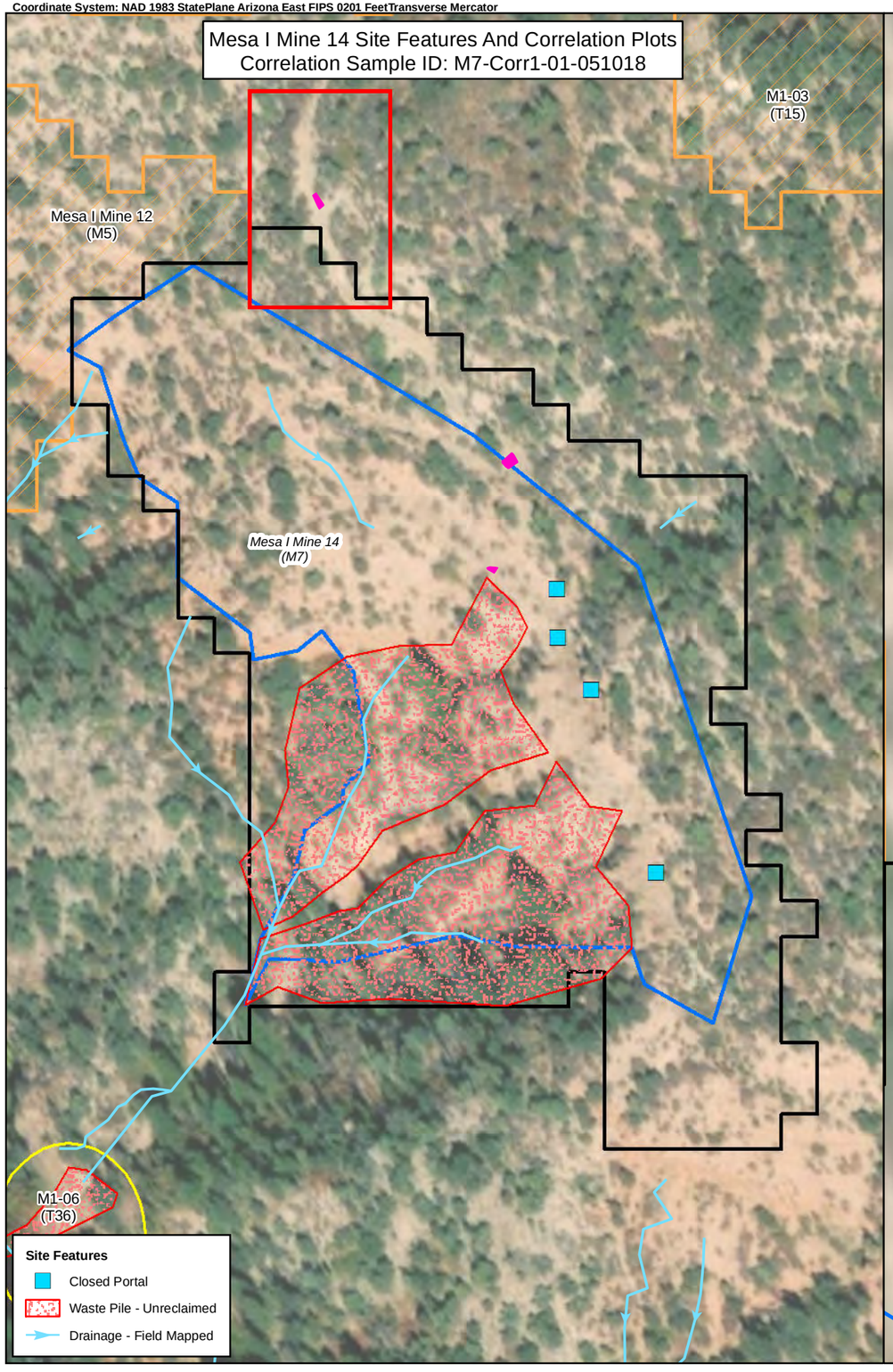
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

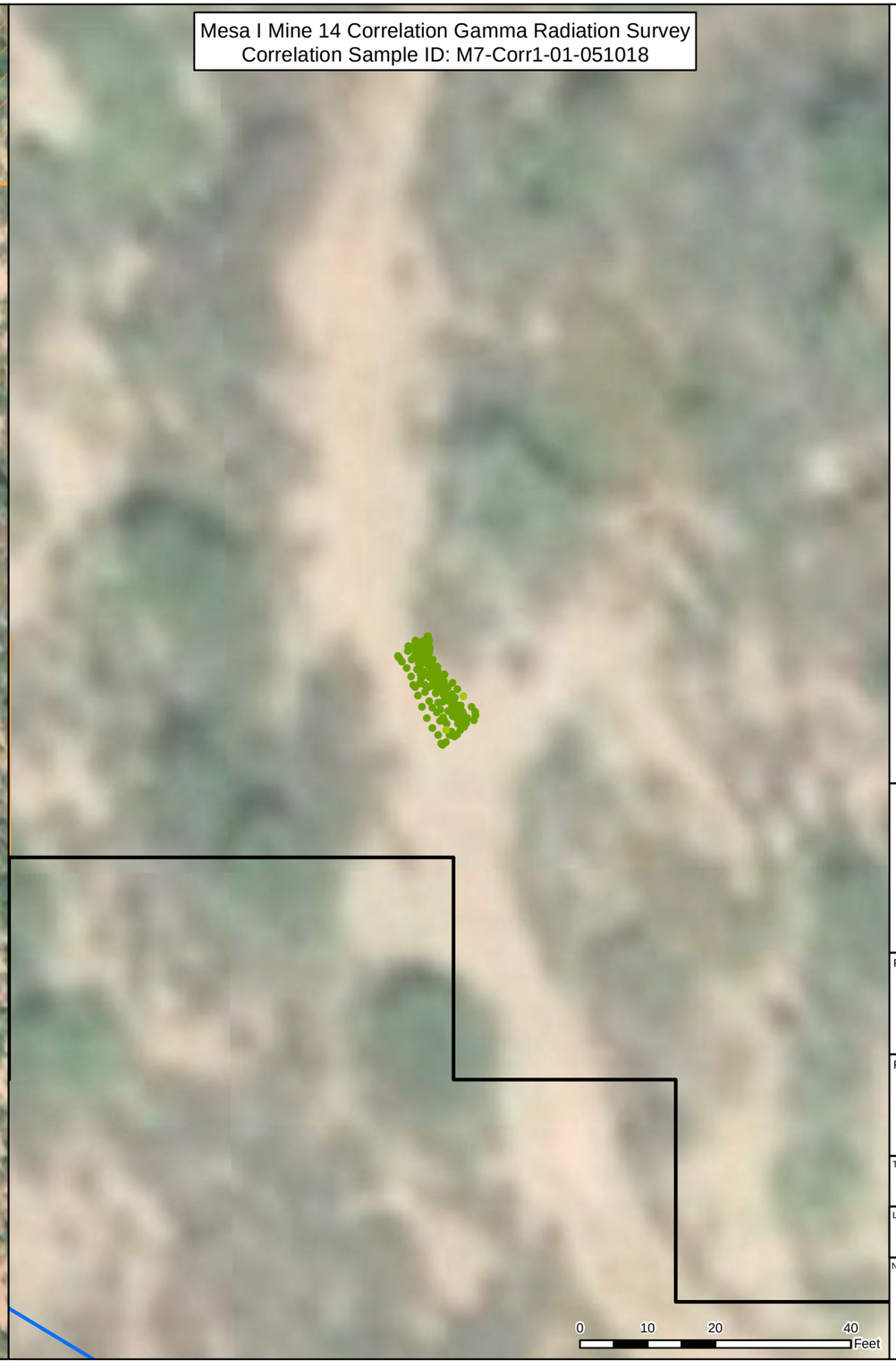
Figure No.: C1-4-5

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 14 Site Features And Correlation Plots
Correlation Sample ID: M7-Corr1-01-051018



Mesa I Mine 14 Correlation Gamma Radiation Survey
Correlation Sample ID: M7-Corr1-01-051018



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 125 ft

1:1,500

N W E S

0 62.5 125 250 Feet

MESA I MINE 14
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

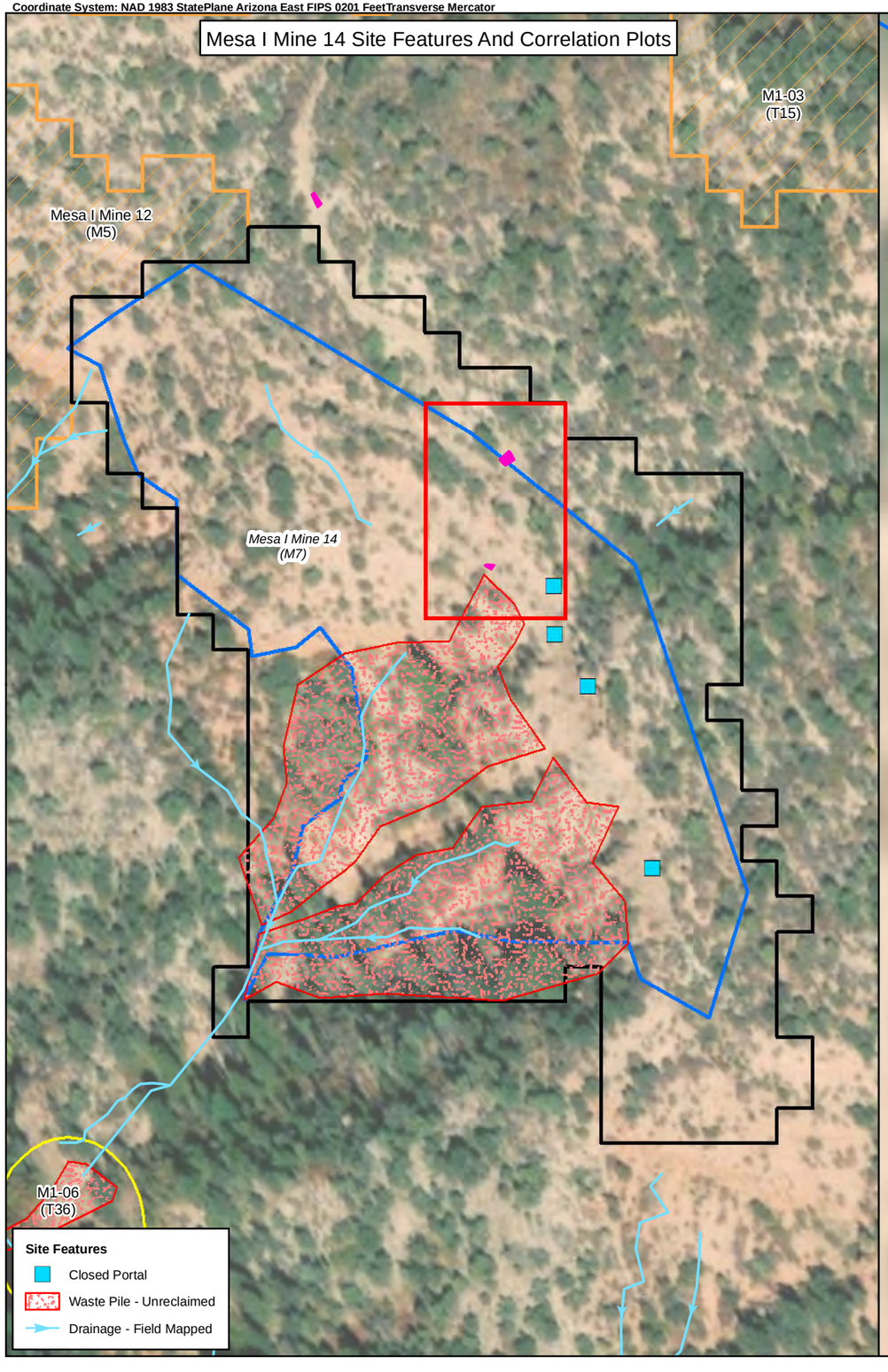
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

Figure No.: C1-4-6

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 14 Site Features And Correlation Plots



Mesa I Mine 14 Correlation Gamma Radiation Survey

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 125 ft

1:1,500

N
W E
S

0 62.5 125 250 Feet

MESA I MINE 14
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

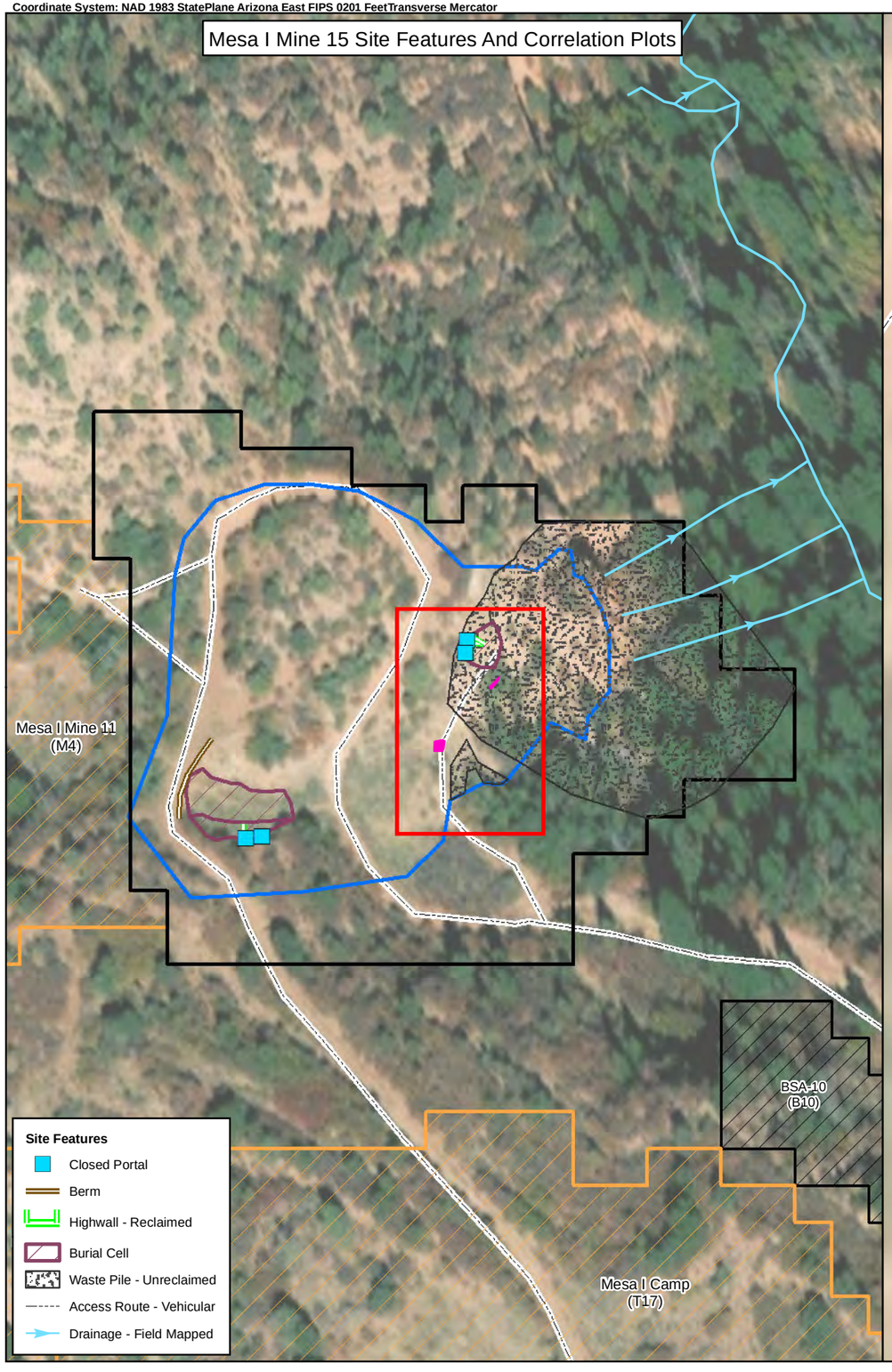
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

Figure No.: C1-4-7

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 15 Site Features And Correlation Plots



Mesa I Mine 15 Correlation Gamma Radiation Survey

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

MESA I MINE 15
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

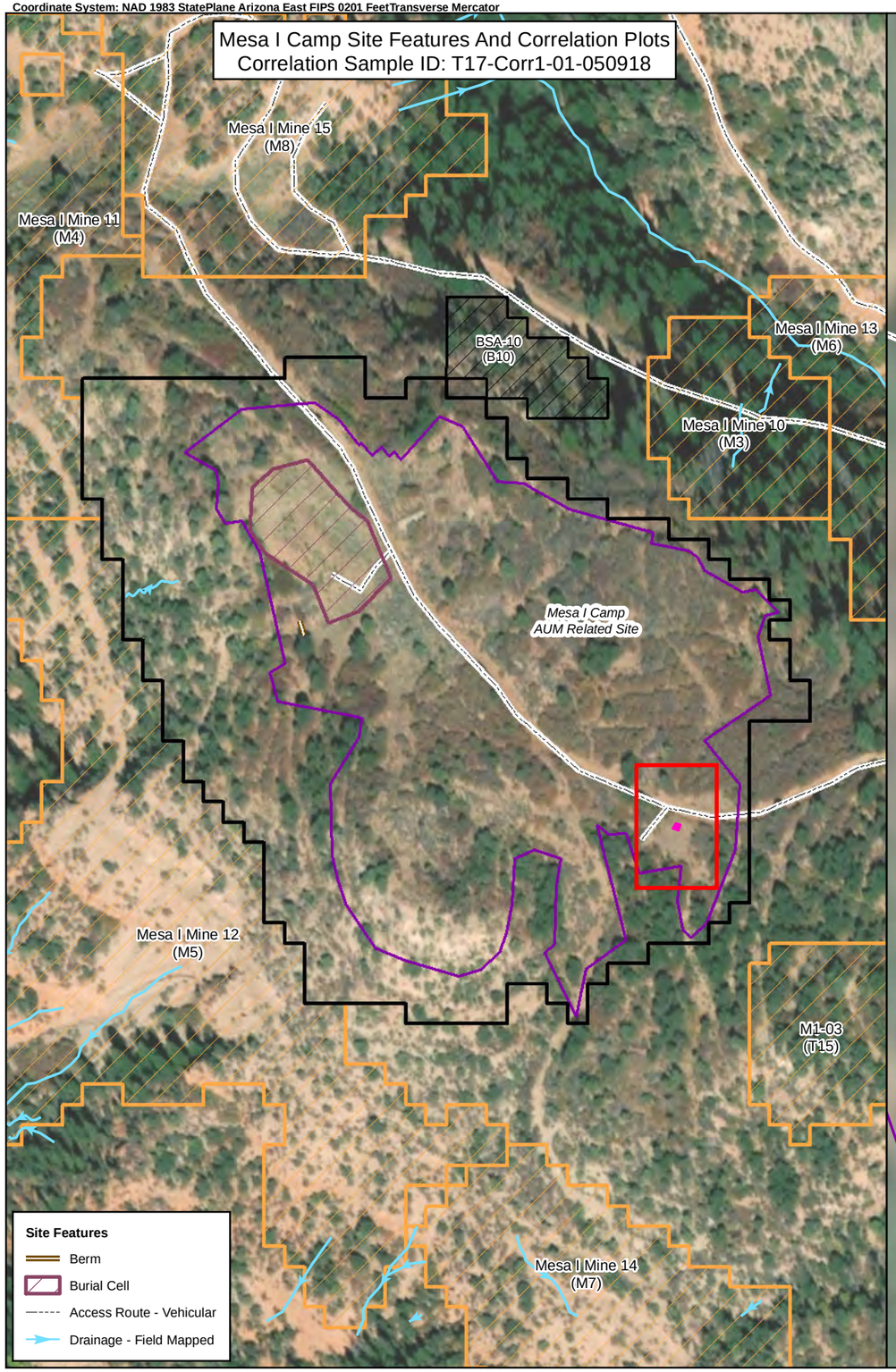
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

Figure No.: C1-4-8

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Camp Site Features And Correlation Plots
Correlation Sample ID: T17-Corr1-01-050918



Site Features
- Berm
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Camp Correlation Gamma Radiation Survey
Correlation Sample ID: T17-Corr1-01-050918

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Related Boundary
- Non-AUM Target Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 220 ft

1:2,640

N
W E
S

0 110 220 440 Feet

MESA I CAMP
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

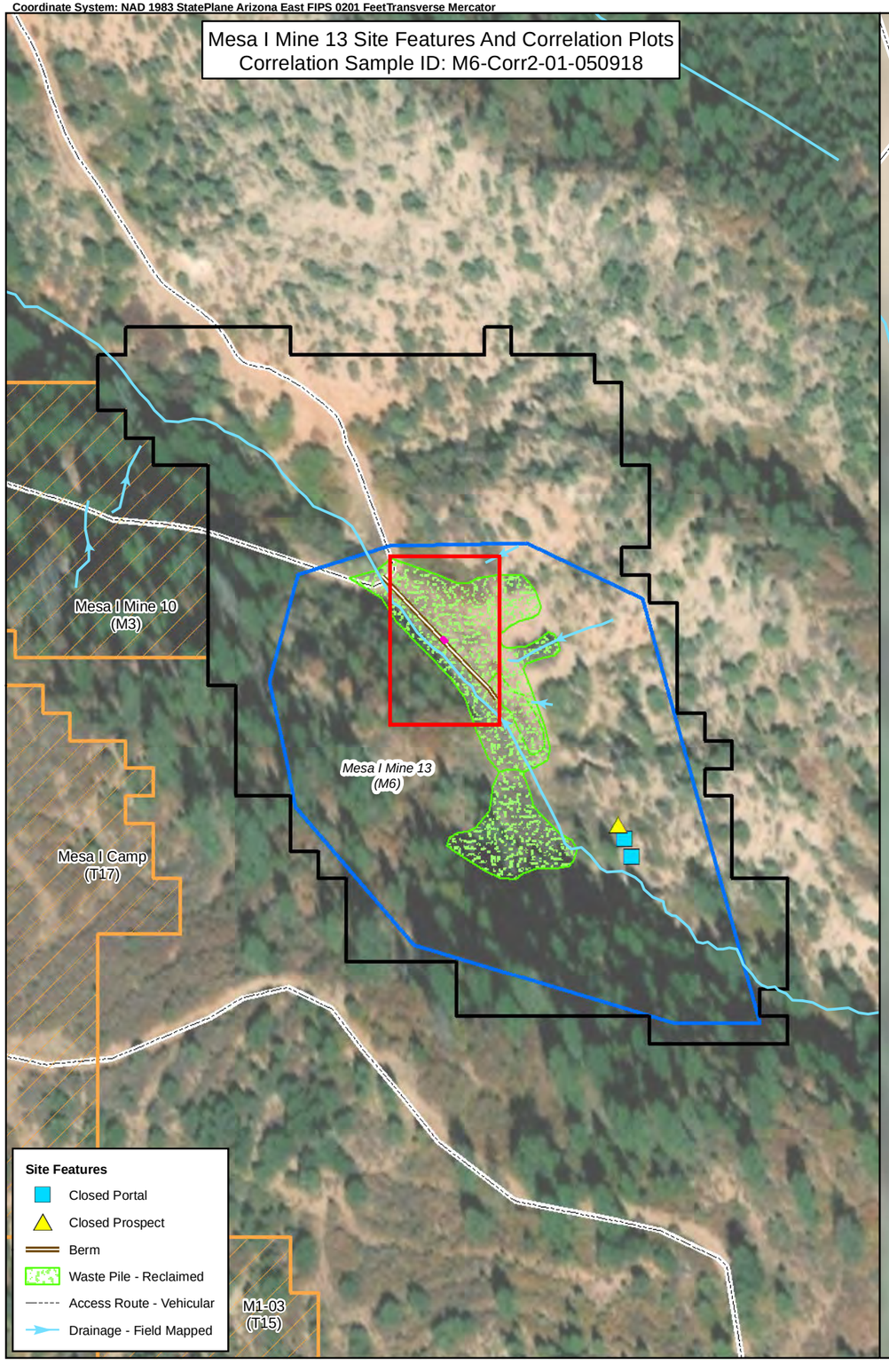
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

Figure No.: C1-4-9

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa I Mine 13 Site Features And Correlation Plots
Correlation Sample ID: M6-Corr2-01-050918



Site Features
- Closed Portal
- Closed Prospect
- Berm
- Waste Pile - Reclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa I Mine 13 Correlation Gamma Radiation Survey
Correlation Sample ID: M6-Corr2-01-050918

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 160 ft

1:1,920

N
W E
S

0 80 160 320 Feet

MESA I MINE 13
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

Figure No.: C1-4-10

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Site Features And Correlation Plots
Correlation Sample ID: M6-Corr1-01-051018

Correlation Gamma Radiation Survey
Correlation Sample ID: M6-Corr1-01-051018

Site Features
- Access Route - Vehicular
- Drainage - Field Mapped

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot

0 10 20 40 Feet

1 in = 50 ft

1:600

N W E S

0 25 50 100 Feet

MESA I MINE 13
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 6/9/2019

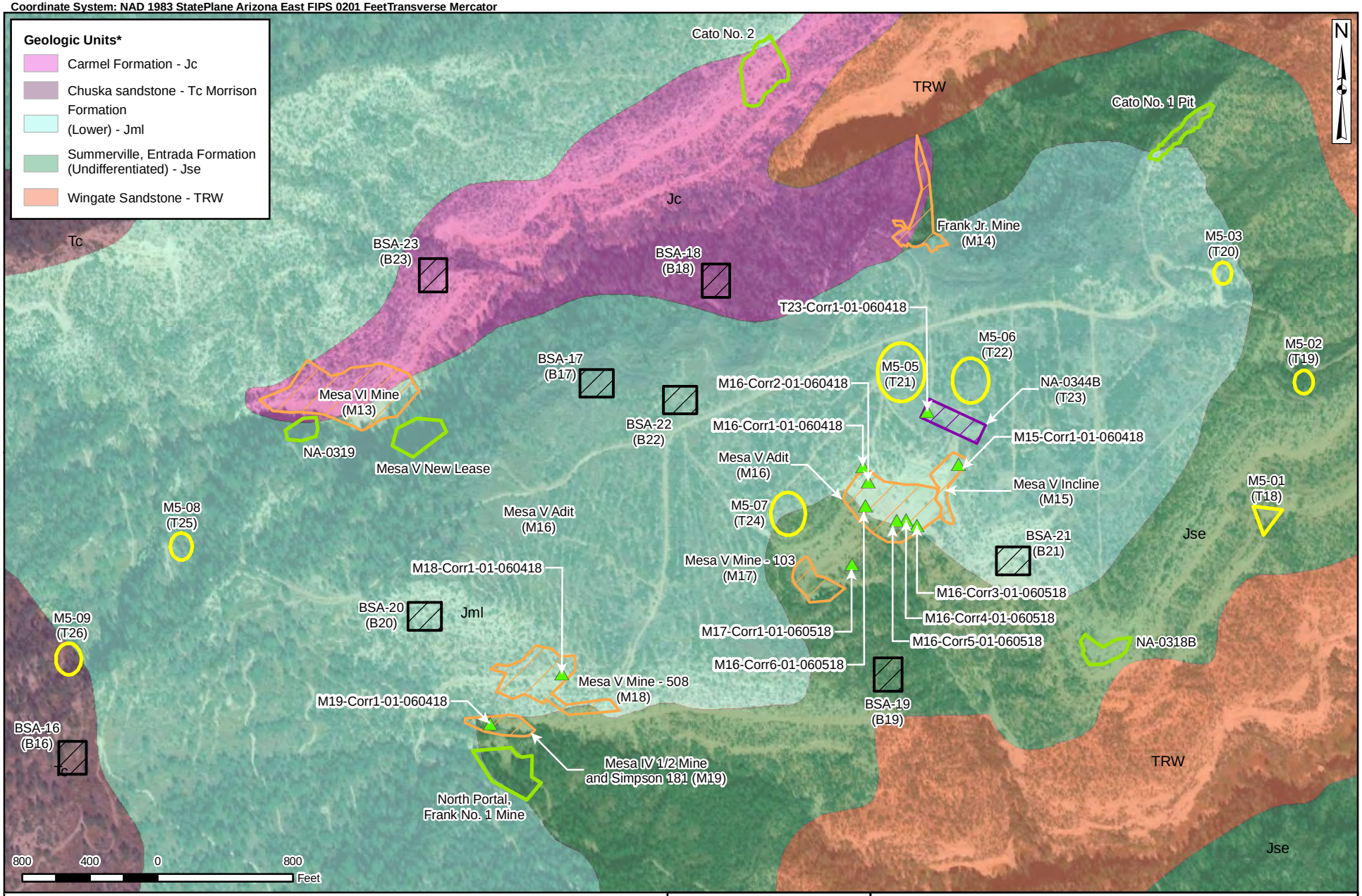
Notes:
*Correlation plot lies within Lower Morrison formation (Jml) geologic unit and used in development of the Group D correlation.

Figure No.: C1-4-11

ATTACHMENT C1-5

GROUP F CORRELATION MAPS AND SCAN DATA

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Correlation Sampling Location
Tronox AUM Site Boundary
Non-AUM Target Site Boundary
AUM Related Site Boundary
Background Sampling Location
Non-Tronox AUM Site

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for:

Prepared By:
TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

GROUP F
CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-5-1
Location: COVE CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Adit Site Features And Correlation Plots

M5-06
(T22)

NA-0344B
(T23)

Mesa V Incline
(M15)

Mesa V Adit Mine
(M16)

Mesa V Mine
(M17)

Middle 1A

Middle 1A

Middle 1A

Site Features
- Closed Portal
- Closed Prospect
- Berm
- Highwall - Reclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa V Adit Correlation Gamma Radiation Survey

M16-Corr1-01-060418

M16-Corr2-01-060418

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

MESA V ADIT CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 1 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation

Figure No.: C1-5-2

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Adit Site Features And Correlation Plots
Correlation Sample ID: M16-Corr6-01-060518

M5-06
(T22)

NA-0344B
(T23)

Mesa V Incline
(M15)

Mesa V Adit Mine
(M16)

Mesa V Mine
(M17)

Middle 1A

Middle 1A

Middle 1A

Site Features
- Closed Portal
- Closed Prospect
- Berm
- Highwall - Reclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa V Adit Correlation Gamma Radiation Survey
Correlation Sample ID: M16-Corr6-01-060518

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

MESA V ADIT
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation

Figure No.: C1-5-3

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Adit Site Features And Correlation Plots

M5-06
(T22)

NA-0344B
(T23)

Mesa V Incline
(M15)

Mesa V Adit Mine
(M16)

Mesa V Mine
(M17)

Middle 1A

Middle 1A

Middle 1A

Site Features

- Closed Portal
- Closed Prospect
- Berm
- Highwall - Reclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa V Adit Correlation Gamma Radiation Survey

M16-Corr5-01-060518

M16-Corr4-01-060518

0 10 20 40 Feet

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

MESA V ADIT
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 3 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

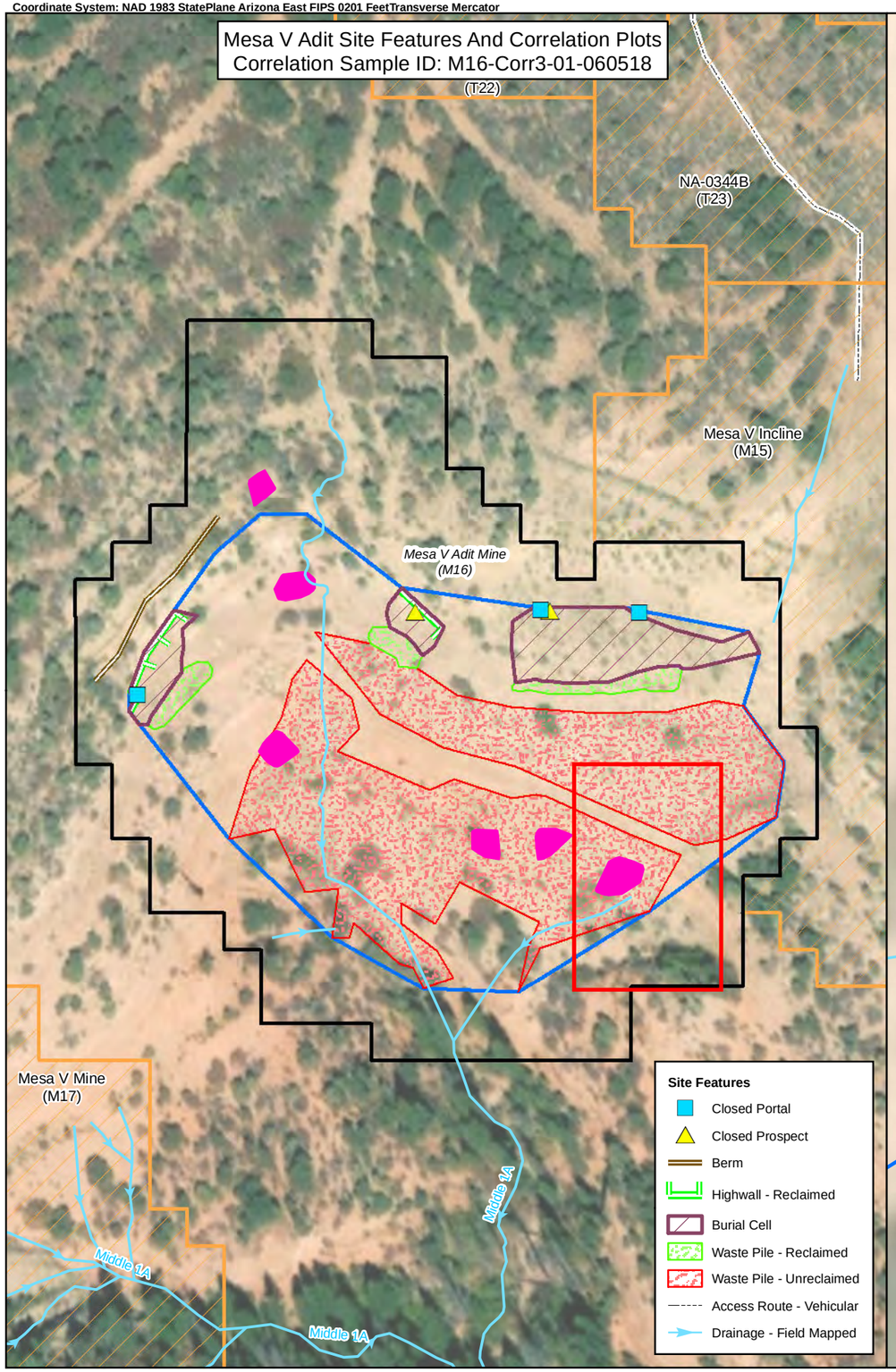
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation.

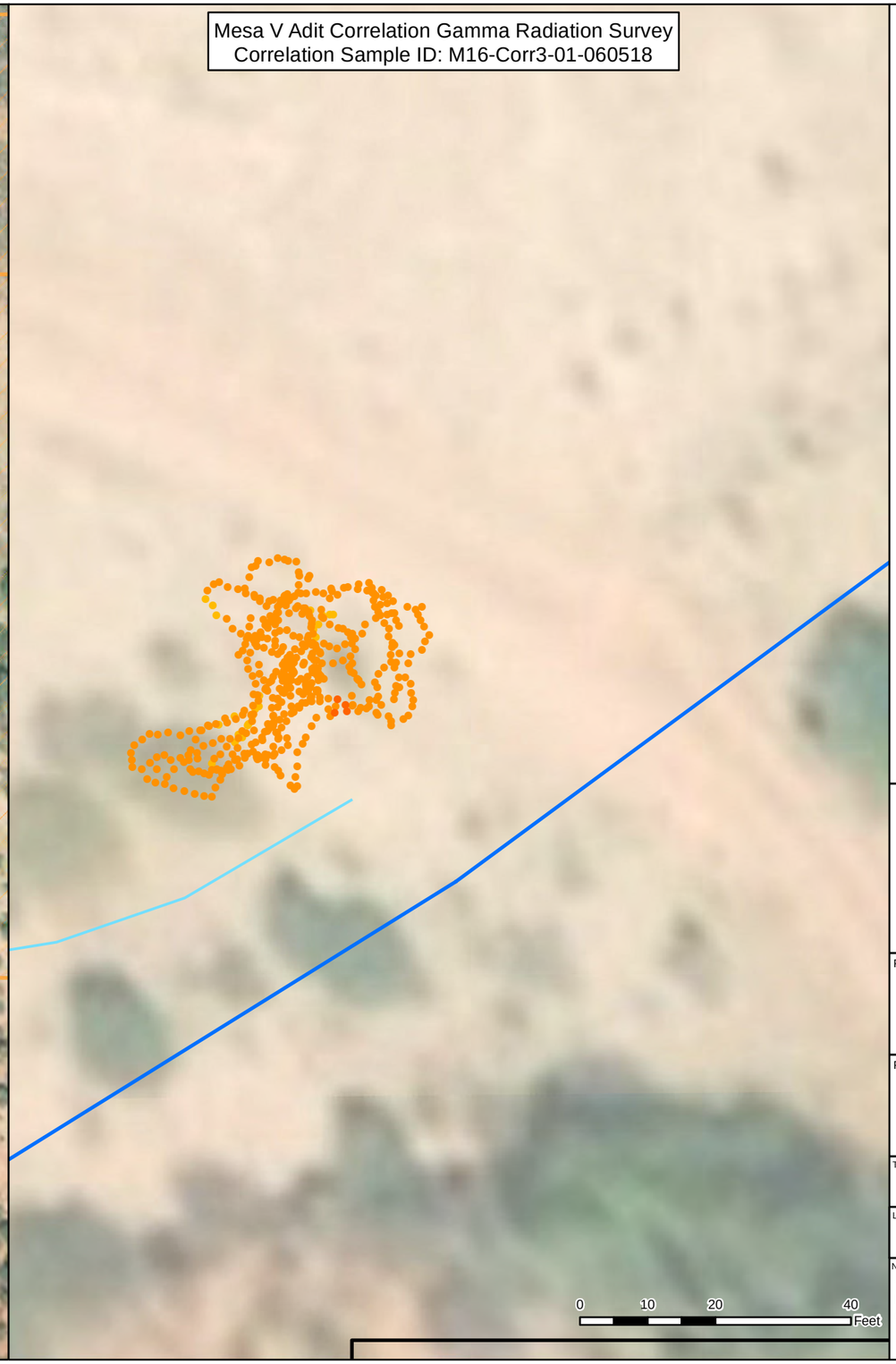
Figure No.: C1-5-4

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Adit Site Features And Correlation Plots
Correlation Sample ID: M16-Corr3-01-060518



Mesa V Adit Correlation Gamma Radiation Survey
Correlation Sample ID: M16-Corr3-01-060518



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 120 ft

1:1,440

N
W E
S

0 60 120 240 Feet

MESA V ADIT
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 4 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

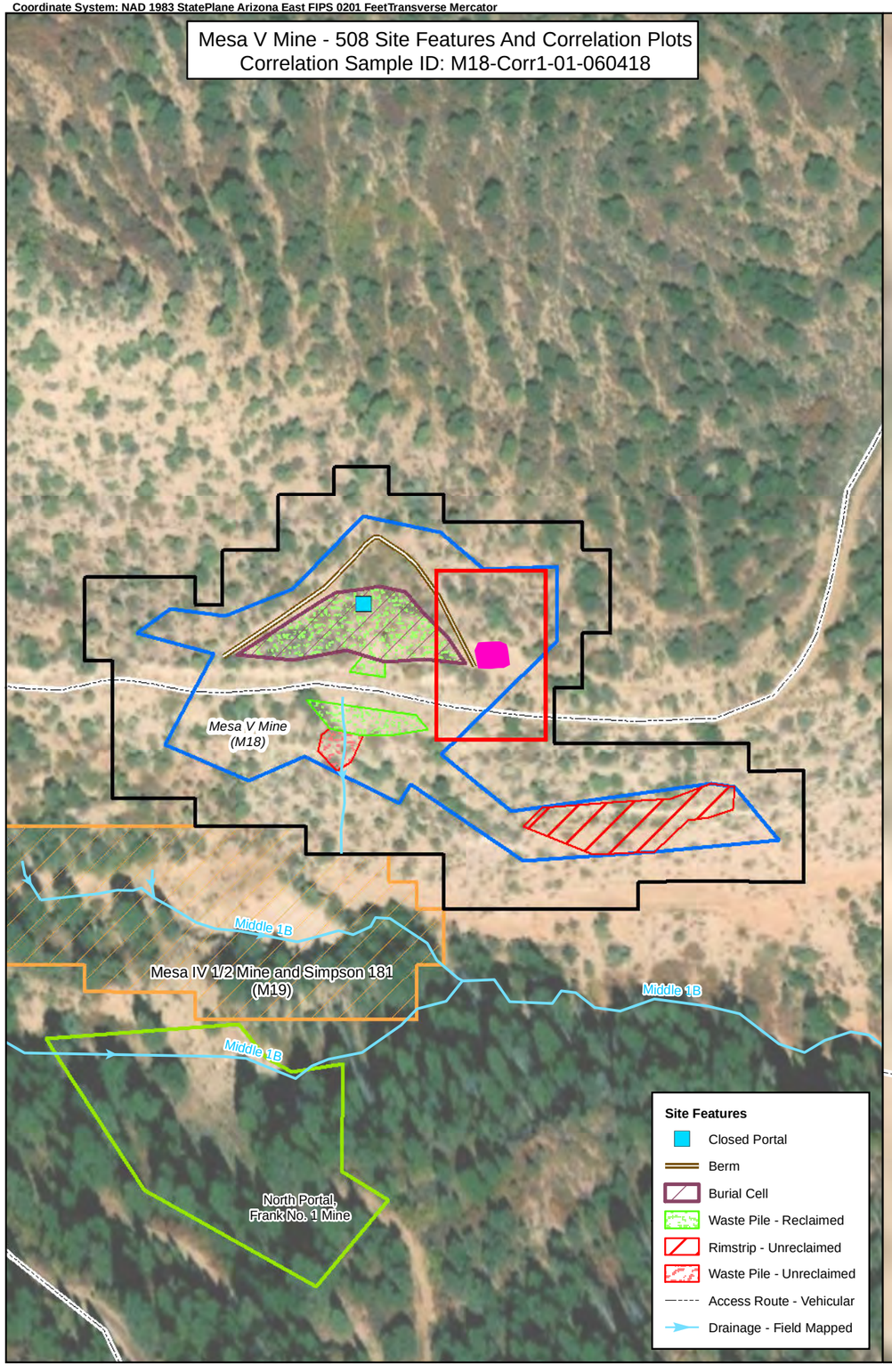
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation.

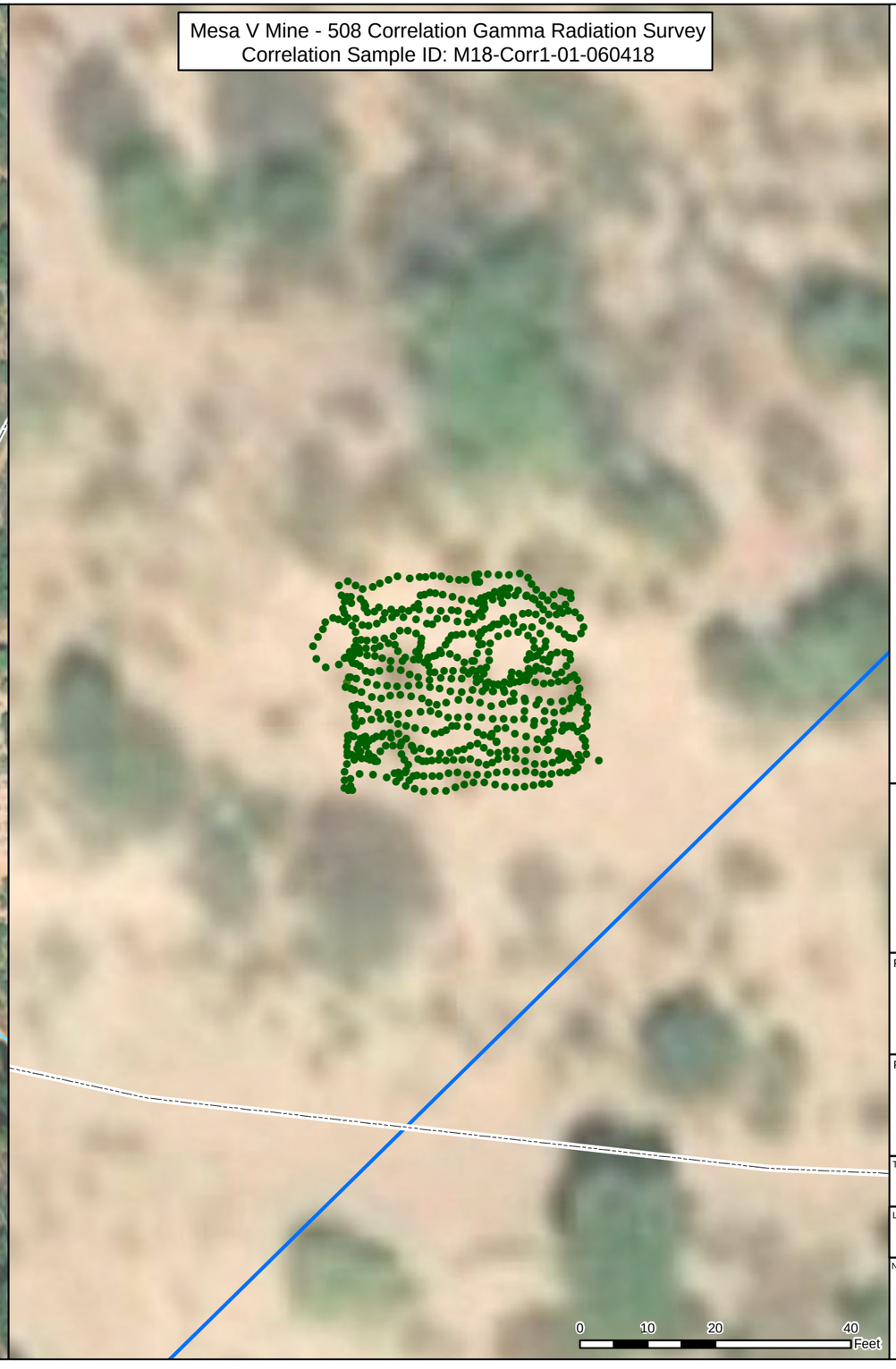
Figure No.:
C1-5-5

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Mine - 508 Site Features And Correlation Plots
Correlation Sample ID: M18-Corr1-01-060418



Mesa V Mine - 508 Correlation Gamma Radiation Survey
Correlation Sample ID: M18-Corr1-01-060418



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area
- Non-Tronox AUM Site

1 in = 160 ft

1:1,920

N W E S

0 80 160 320 Feet

MESA V MINE - 508
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

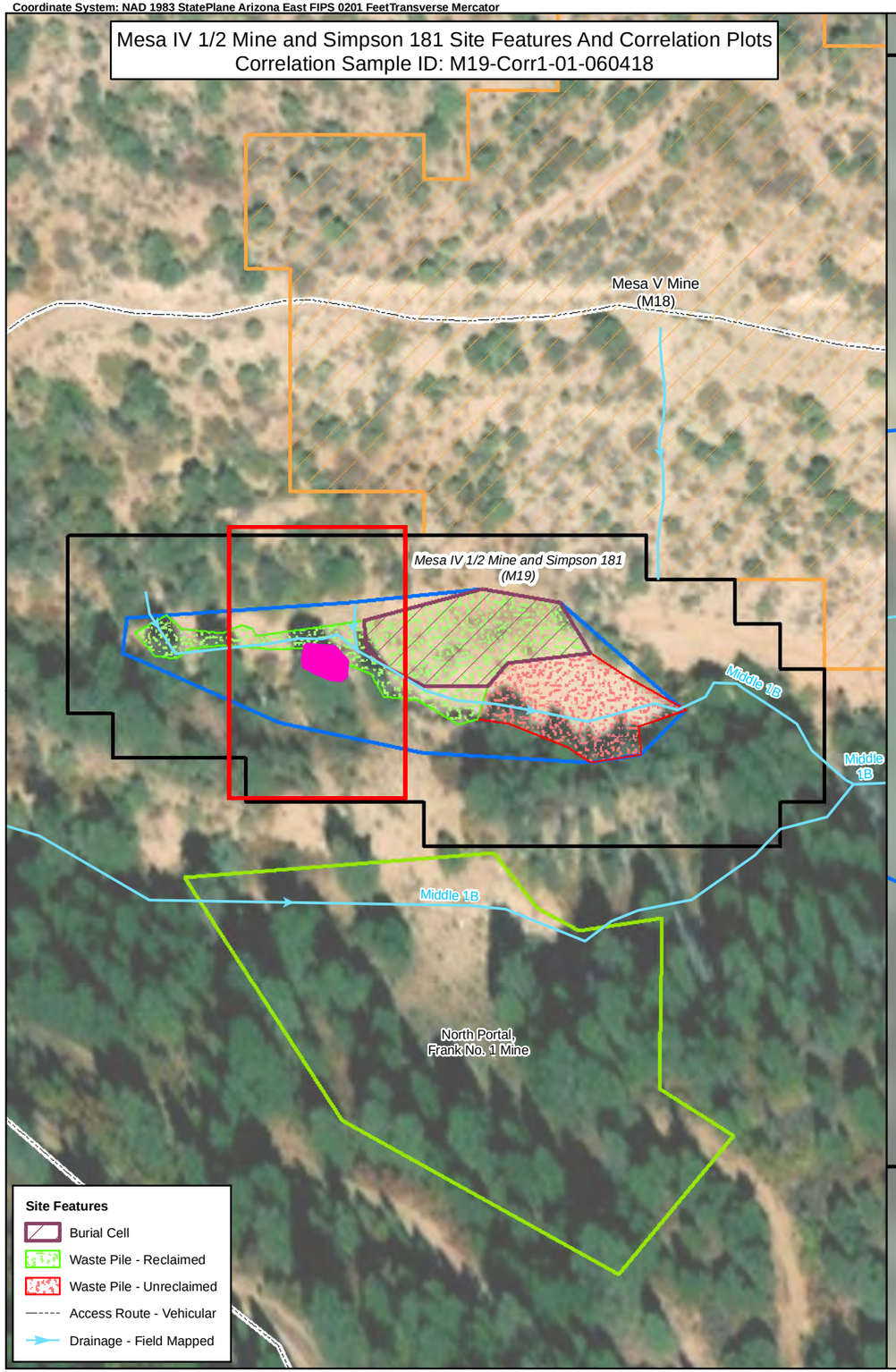
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation.

Figure No.: C1-5-6

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV 1/2 Mine and Simpson 181 Site Features And Correlation Plots
Correlation Sample ID: M19-Corr1-01-060418



Mesa IV 1/2 Mine and Simpson 181 Correlation Gamma Radiation Survey
Correlation Sample ID: M19-Corr1-01-060418

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area
- Non-Tronox AUM Site

1 in = 100 ft

1:1,200

N W E S

0 50 100 200 Feet

MESA IV 1/2 MINE AND SIMPSON 181 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

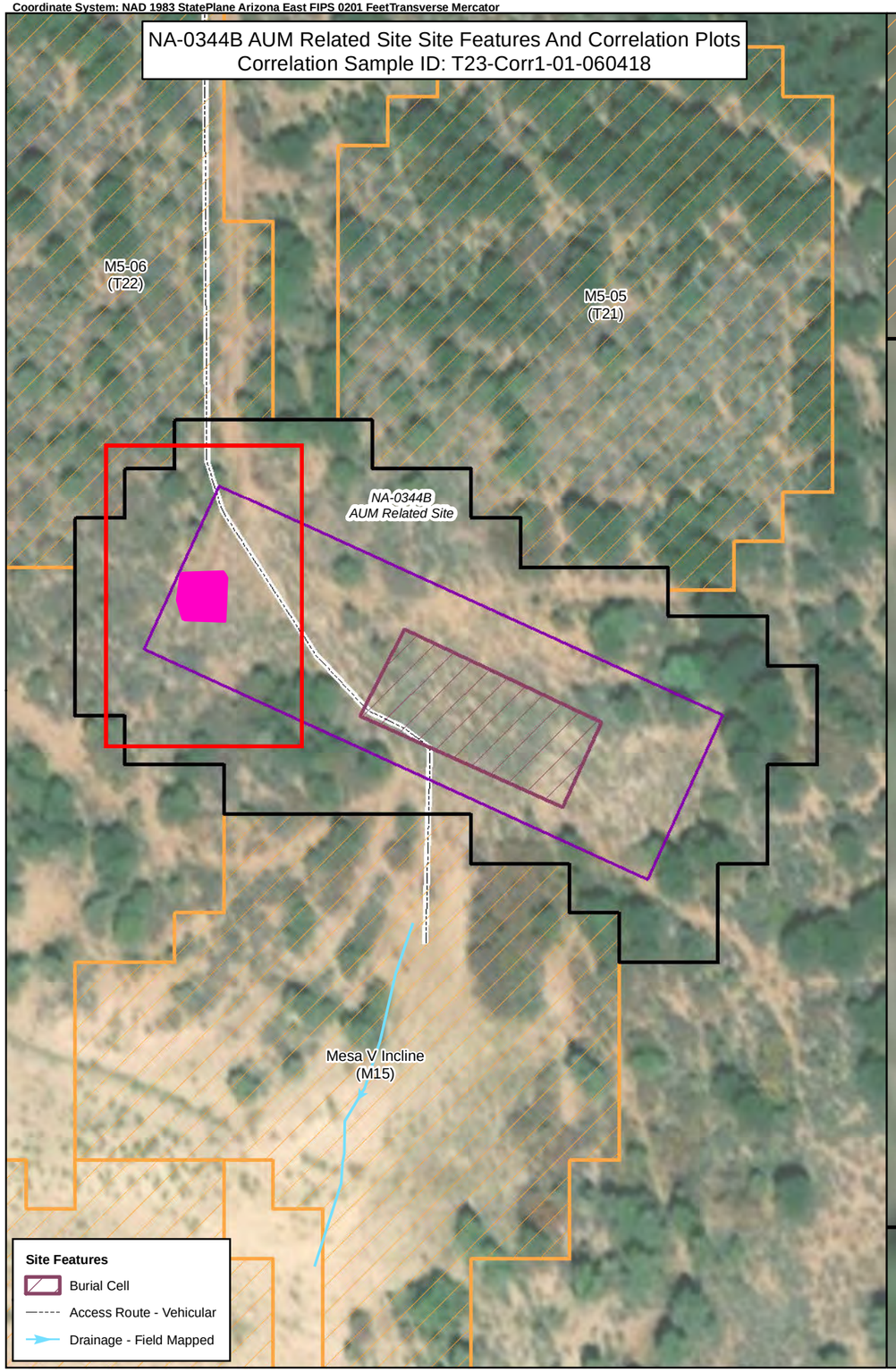
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation.

Figure No.: C1-5-7

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

NA-0344B AUM Related Site Site Features And Correlation Plots
Correlation Sample ID: T23-Corr1-01-060418



Site Features
- Burial Cell
- Access Route - Vehicular
- Drainage - Field Mapped

NA-0344B AUM Related Site Correlation Gamma Radiation Survey
Correlation Sample ID: T23-Corr1-01-060418

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Related Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 90 ft

1:1,080

N
W E
S

0 45 90 180 Feet

NA-0344B AUM RELATED SITE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation.

Figure No.: C1-5-8

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Incline Site Features And Correlation Plots
Correlation Sample ID: M15-Corr1-01-060418

NA-0344B
(T23)

Mesa V Incline Mine
(M15)

Mesa V Adit
(M16)

Site Features
- Closed Portal
- Berm
- Highwall - Reclaimed
- Waste Pile - Reclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa V Incline Correlation Gamma Radiation Survey
Correlation Sample ID: M15-Corr1-01-060418

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 80 ft

1:960

N W E S

0 40 80 160 Feet

MESA V INCLINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

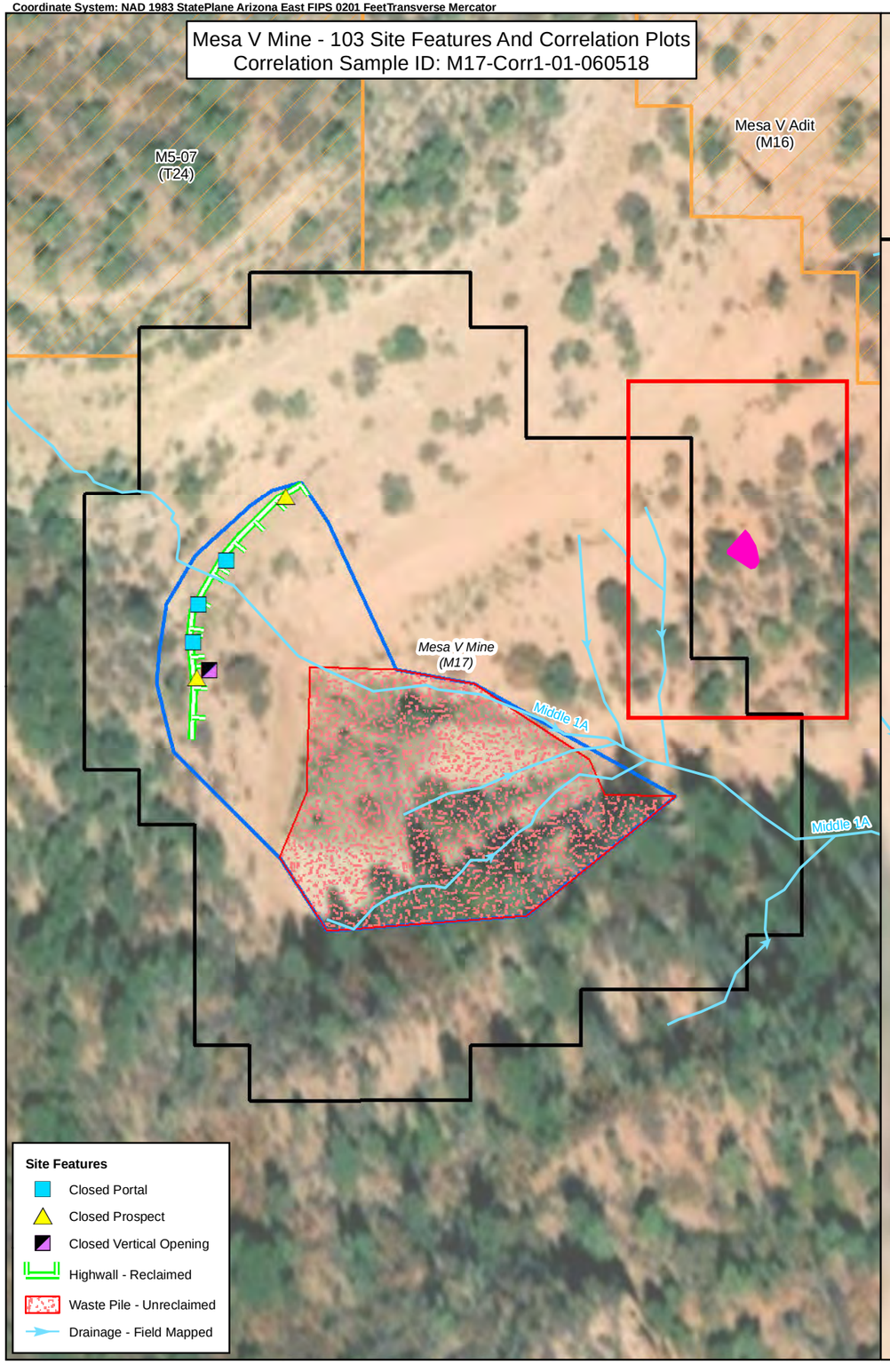
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation.

Figure No.: C1-5-9

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa V Mine - 103 Site Features And Correlation Plots
Correlation Sample ID: M17-Corr1-01-060518



Site Features
- Closed Portal
- Closed Prospect
- Closed Vertical Opening
- Highwall - Reclaimed
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Mesa V Mine - 103 Correlation Gamma Radiation Survey
Correlation Sample ID: M17-Corr1-01-060518

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- Survey Area Boundary
- Other Survey Area

1 in = 80 ft

1:960

N W E S

0 40 80 160 Feet

MESA V MINE - 103
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

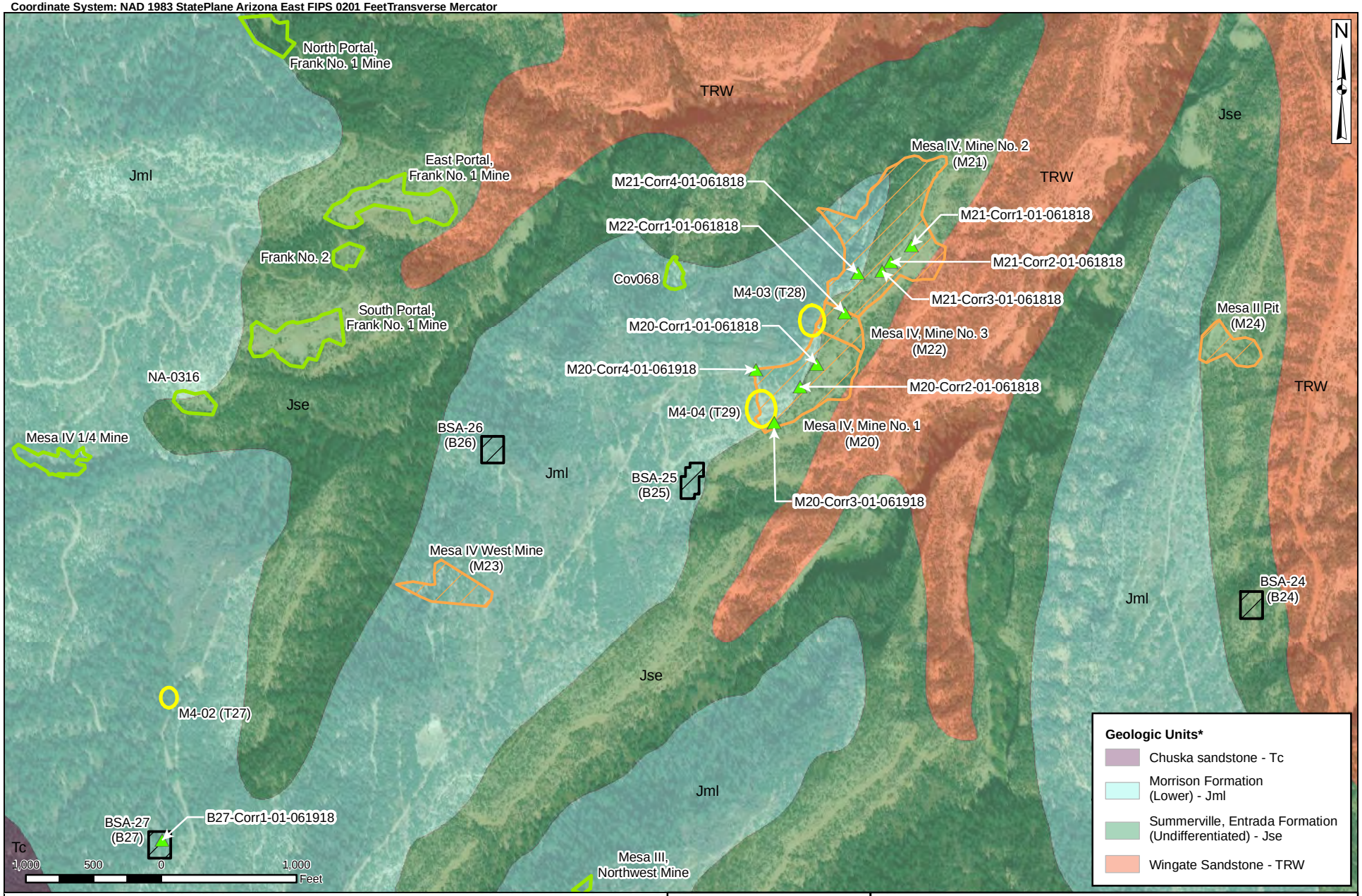
Notes:
*Correlation plot lies within the Lower Morrison Formation (Jml) and used in development of the Group F correlation.

Figure No.: C1-5-10

ATTACHMENT C1-6

GROUP G CORRELATION MAPS AND SCAN DATA

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Correlation Sampling Location

Background Sampling Location

Tronox AUM Site Boundary

Non-Tronox AUM Site

Non-AUM Target Site Boundary

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for:

Prepared By:

TETRA TECH
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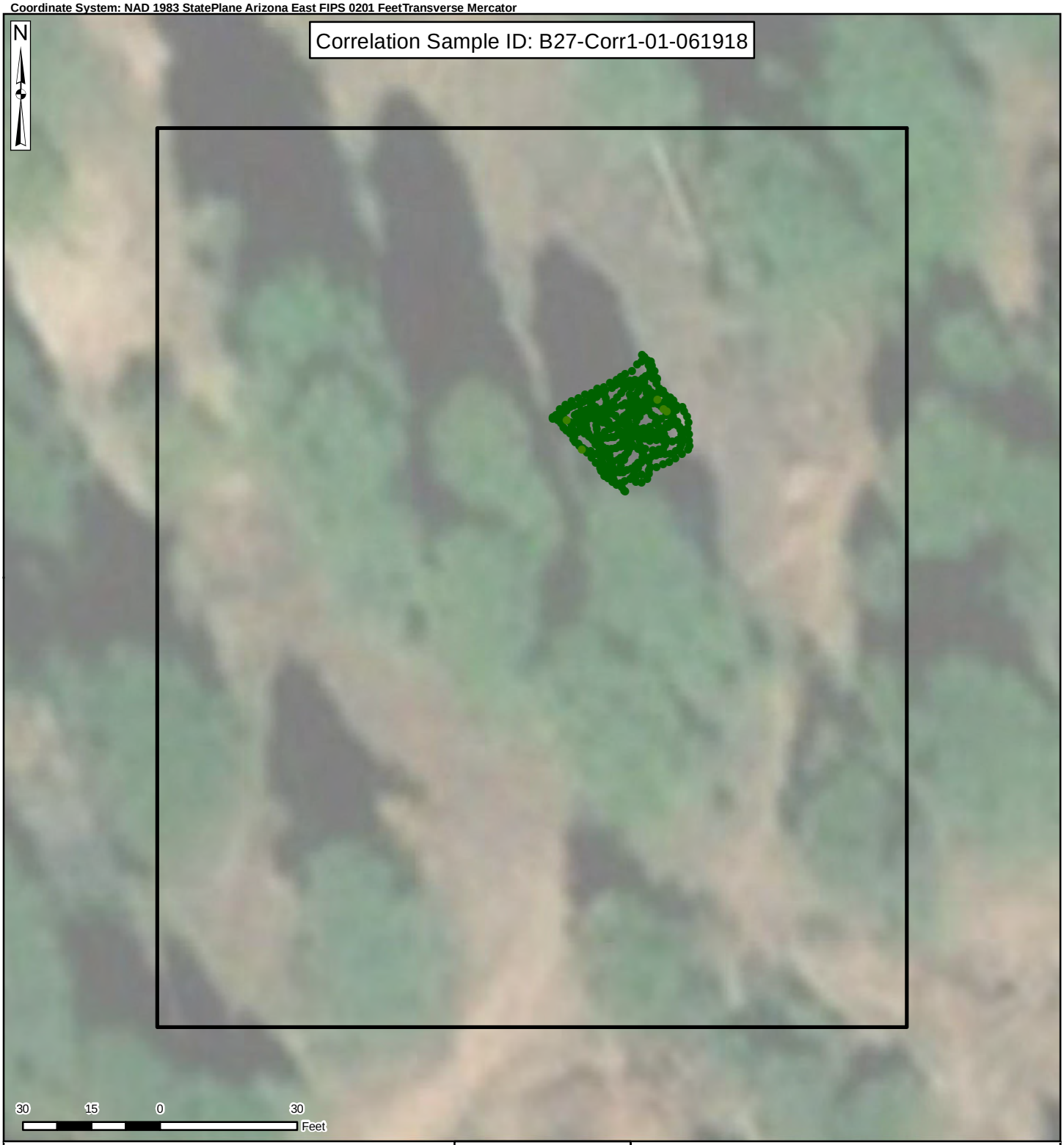
GROUP G
CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-6-1
Location: COVE CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425

Background Location

*Correlation plot lies within the Summerville lower formation (Jml) geologic unit.

Prepared for: U.S. EPA Region 9

Prepared By:

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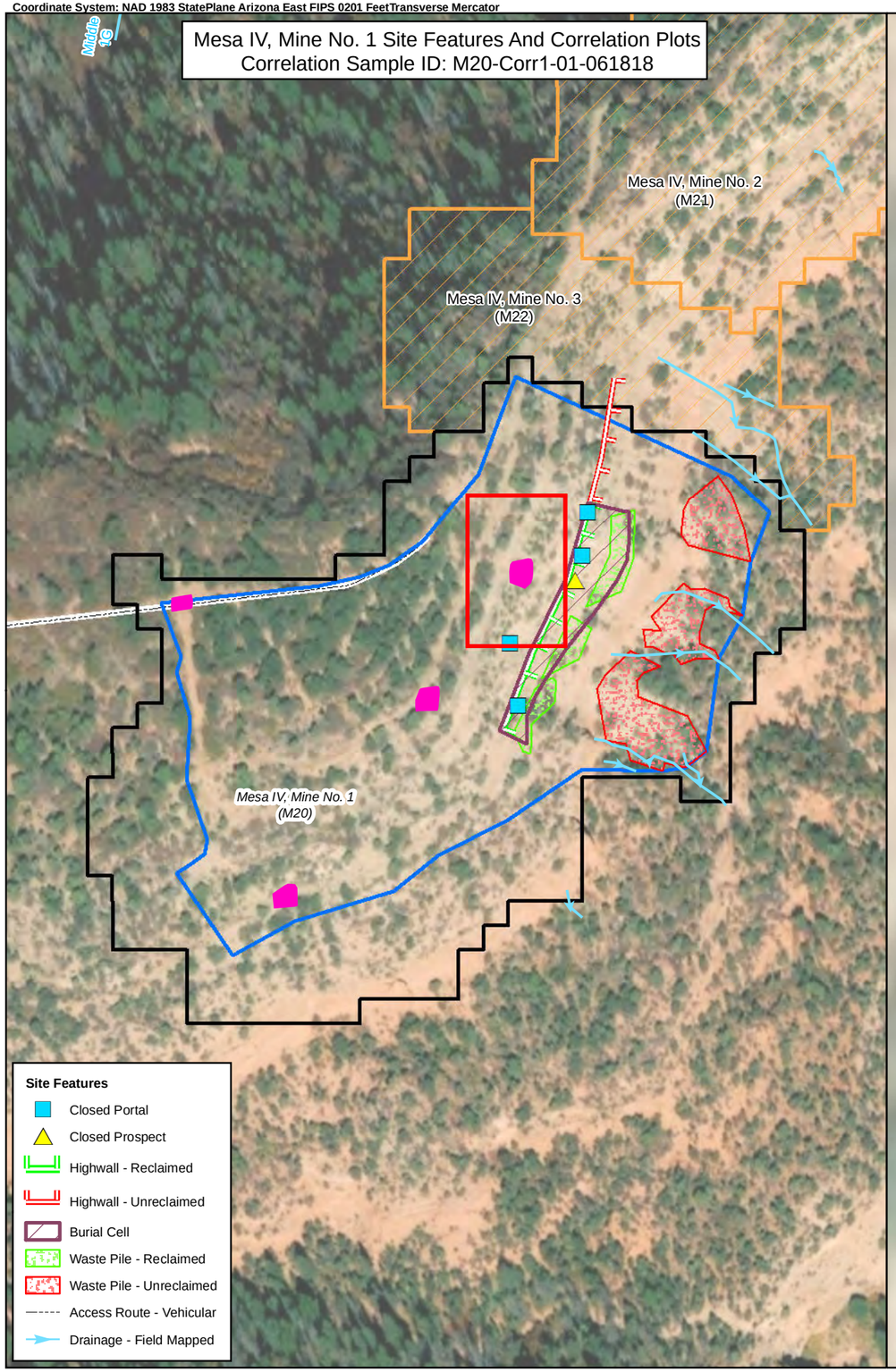
Oakland, CA 94612

BSA-27 BACKGROUND SITE CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-6-2
Location: COVE CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 1 Site Features And Correlation Plots
Correlation Sample ID: M20-Corr1-01-061818



Site Features
- Closed Portal
- Closed Prospect
- Highwall - Reclaimed
- Highwall - Unreclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa IV, Mine No. 1 Correlation Gamma Radiation Survey
Correlation Sample ID: M20-Corr1-01-061818

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 180 ft

1:2,160

N W E S

0 90 180 360 Feet

MESA IV, MINE NO. 1 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 1 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-6-3

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 1 Site Features And Correlation Plots
Correlation Sample ID: M20-Corr2-01-061818

Mesa IV, Mine No. 2
(M21)

Mesa IV, Mine No. 3
(M22)

Mesa IV, Mine No. 1
(M20)

Site Features

- Closed Portal
- Closed Prospect
- Highwall - Reclaimed
- Highwall - Unreclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa IV, Mine No. 1 Correlation Gamma Radiation Survey
Correlation Sample ID: M20-Corr2-01-061818

0 10 20 40 Feet

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 180 ft

1:2,160

N W E S

0 90 180 360 Feet

MESA IV, MINE NO. 1 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 2 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the geologic units Summerville, Entrada undifferentiated formation (Jse) 52% and the Morrison lower formation (Jml) 48%.

Figure No.: C1-6-4

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 1 Site Features And Correlation Plots
Correlation Sample ID: M20-Corr1-01-061918

Mesa IV, Mine No. 1 Correlation Gamma Radiation Survey
Correlation Sample ID: M20-Corr1-01-061918

Mesa IV, Mine No. 2 (M21)

Mesa IV, Mine No. 3 (M22)

Mesa IV, Mine No. 1 (M20)

Middle 16

Site Features
- Closed Portal
- Closed Prospect
- Highwall - Reclaimed
- Highwall - Unreclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

0 10 20 40 Feet

1 in = 180 ft

1:2,160

N W E S

0 90 180 360 Feet

MESA IV, MINE NO. 1 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 3 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic units.

Figure No.: C1-6-5

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 1 Site Features And Correlation Plots
Correlation Sample ID: M20-Corr4-01-061918

Middle 16

Mesa IV, Mine No. 2
(M21)

Mesa IV, Mine No. 3
(M22)

Mesa IV, Mine No. 1
(M20)

Site Features
- Closed Portal
- Closed Prospect
- Highwall - Reclaimed
- Highwall - Unreclaimed
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa IV, Mine No. 1 Correlation Gamma Radiation Survey
Correlation Sample ID: M20-Corr4-01-061918

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 180 ft

1:2,160

N W E S

0 90 180 360 Feet

MESA IV, MINE NO. 1
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 4 OF 4

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

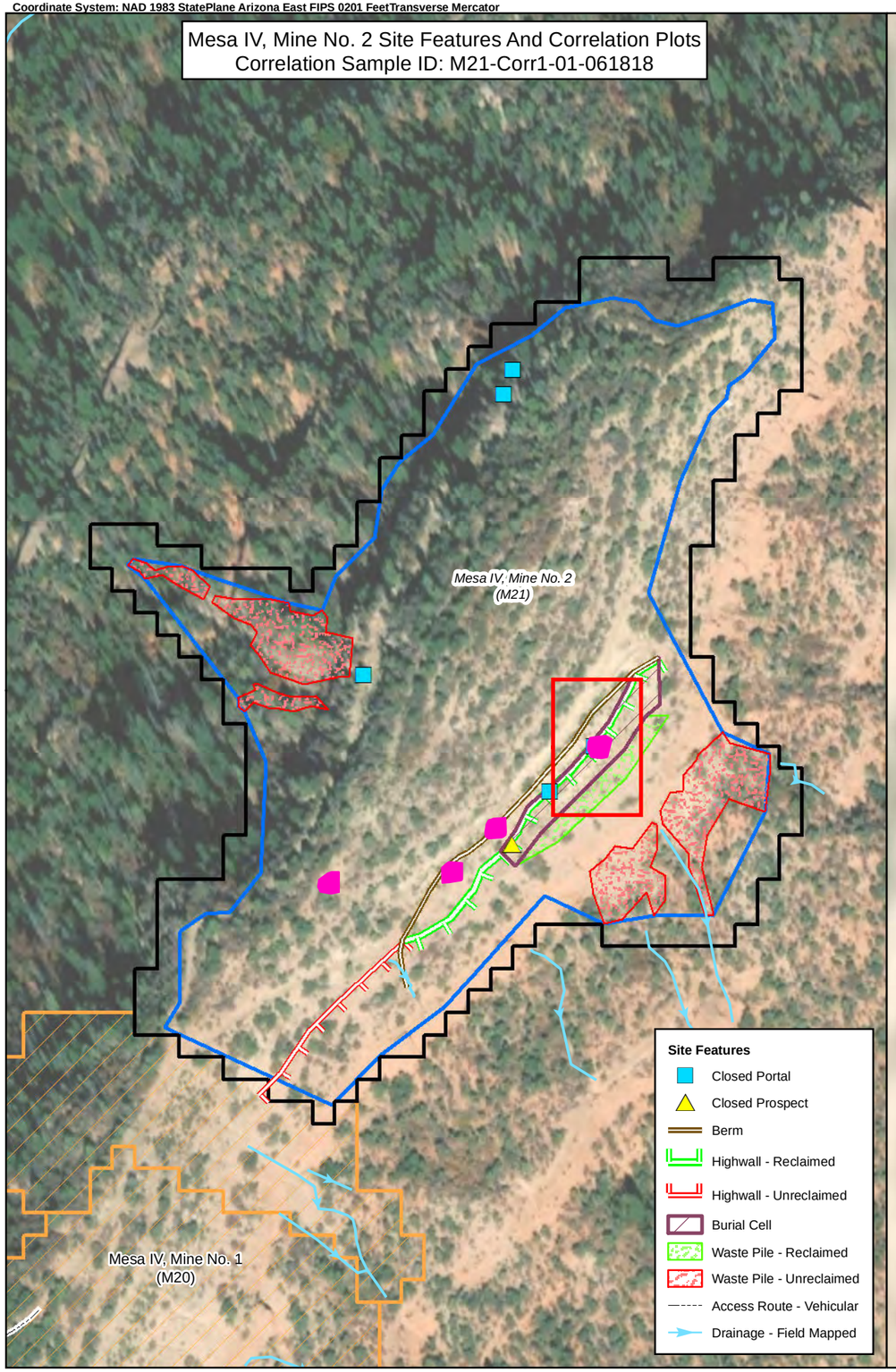
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Morrison lower formation (Jml) geologic unit.

Figure No.: C1-6-6

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 2 Site Features And Correlation Plots
Correlation Sample ID: M21-Corr1-01-061818



Mesa IV, Mine No. 2 Correlation Gamma Radiation Survey
Correlation Sample ID: M21-Corr1-01-061818

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 200 ft

1:2,400

N
W E
S

0 100 200 400 Feet

MESA IV, MINE NO. 2
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

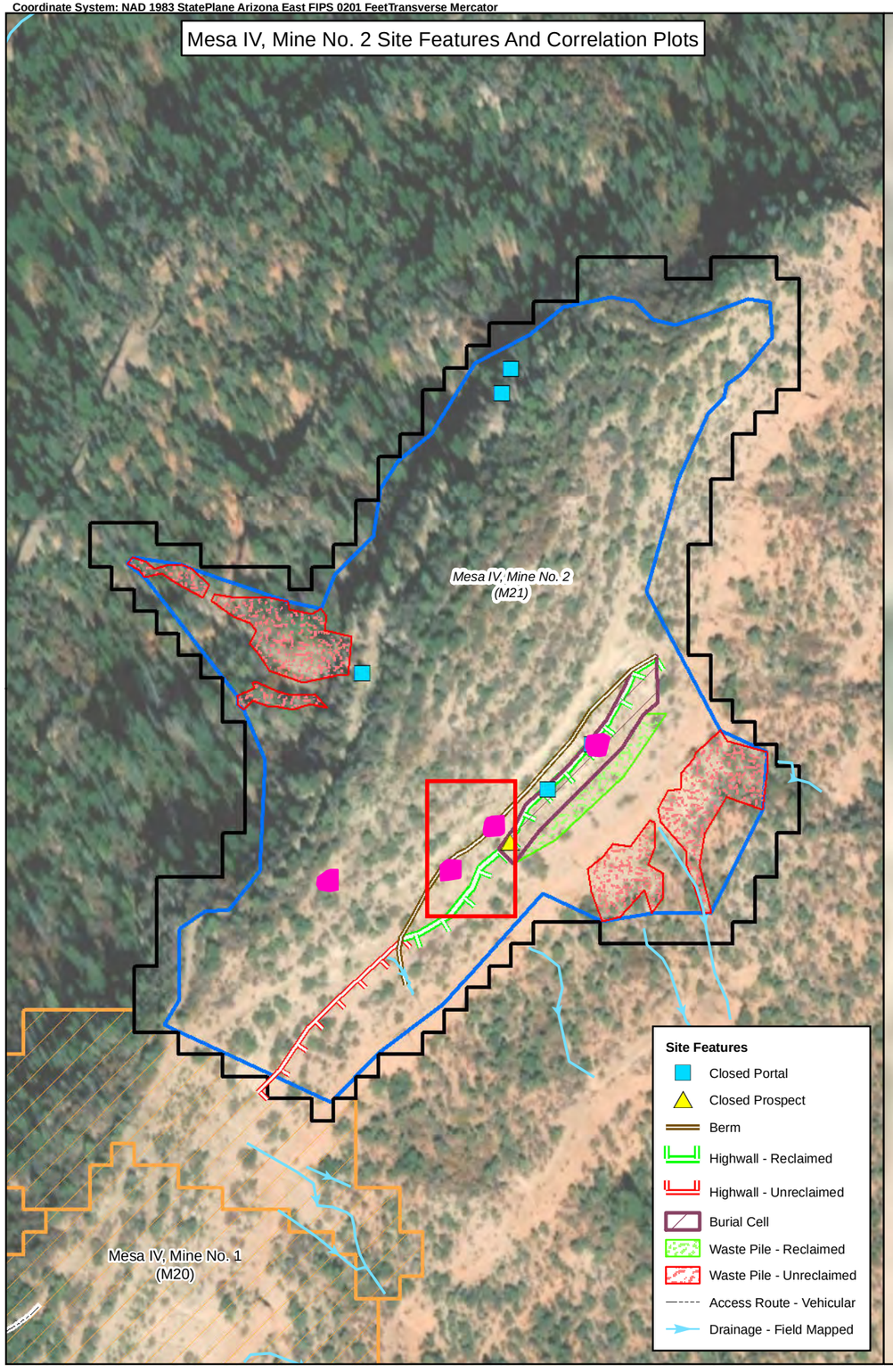
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic units.

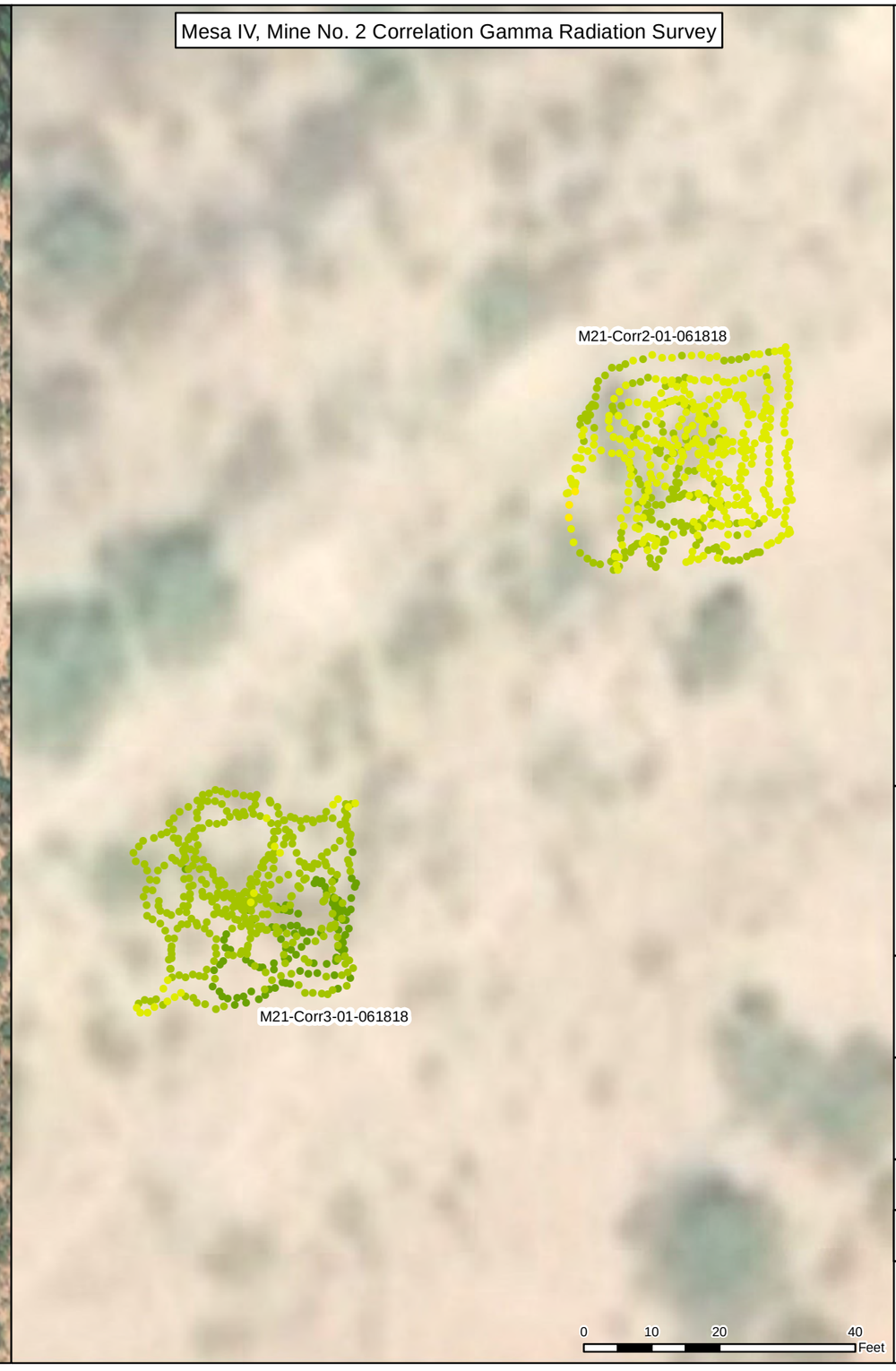
Figure No.:
C1-6-7

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 2 Site Features And Correlation Plots



Mesa IV, Mine No. 2 Correlation Gamma Radiation Survey



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 200 ft

1:2,400

N W E S

0 100 200 400 Feet

MESA IV, MINE NO. 2 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

INSET 2 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

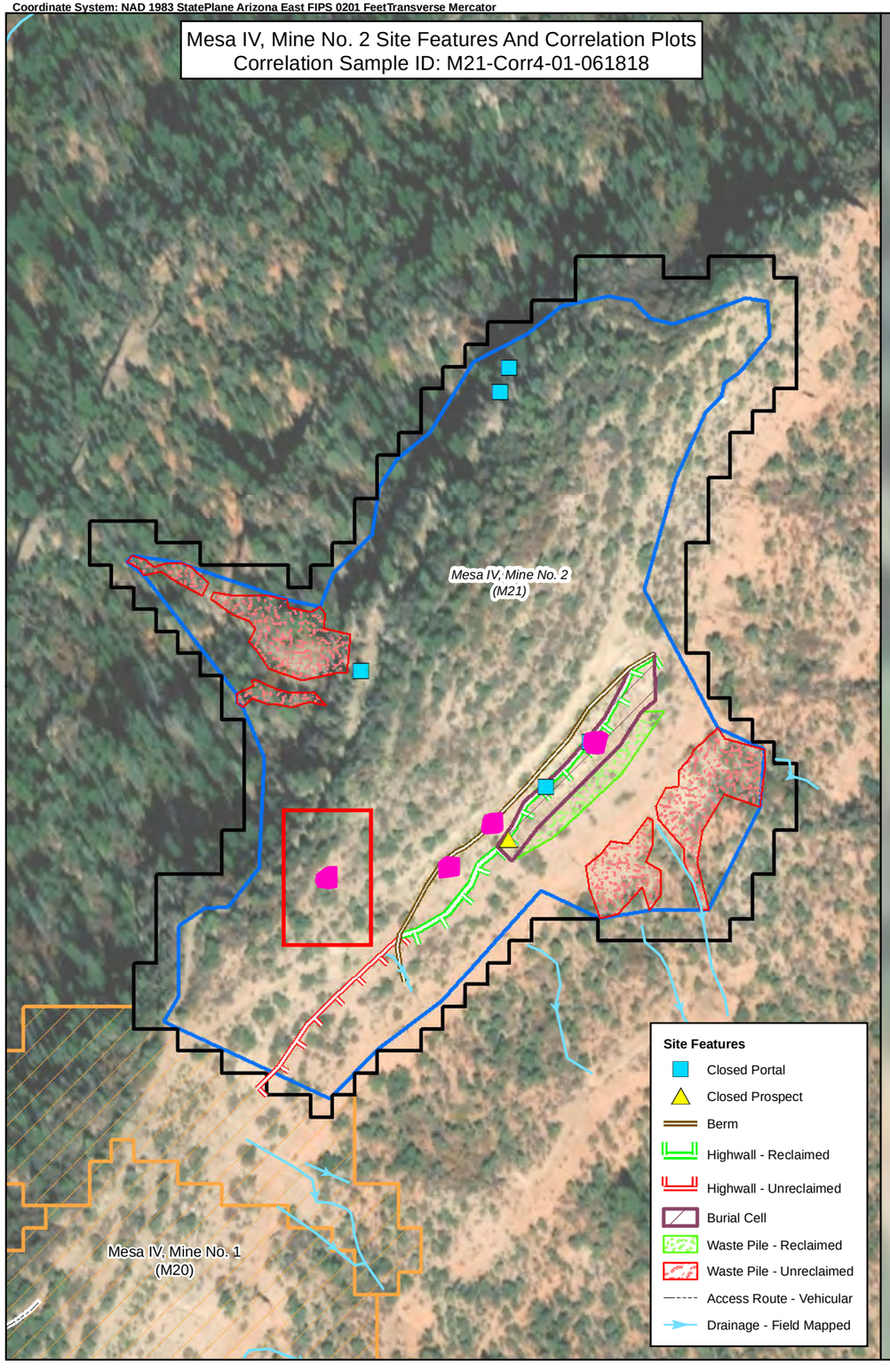
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-6-8

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 2 Site Features And Correlation Plots
Correlation Sample ID: M21-Corr4-01-061818



Mesa IV, Mine No. 2 Correlation Gamma Radiation Survey
Correlation Sample ID: M21-Corr4-01-061818

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 200 ft

1:2,400

N W E S

0 100 200 400 Feet

MESA IV, MINE NO. 2 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

INSET 3 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

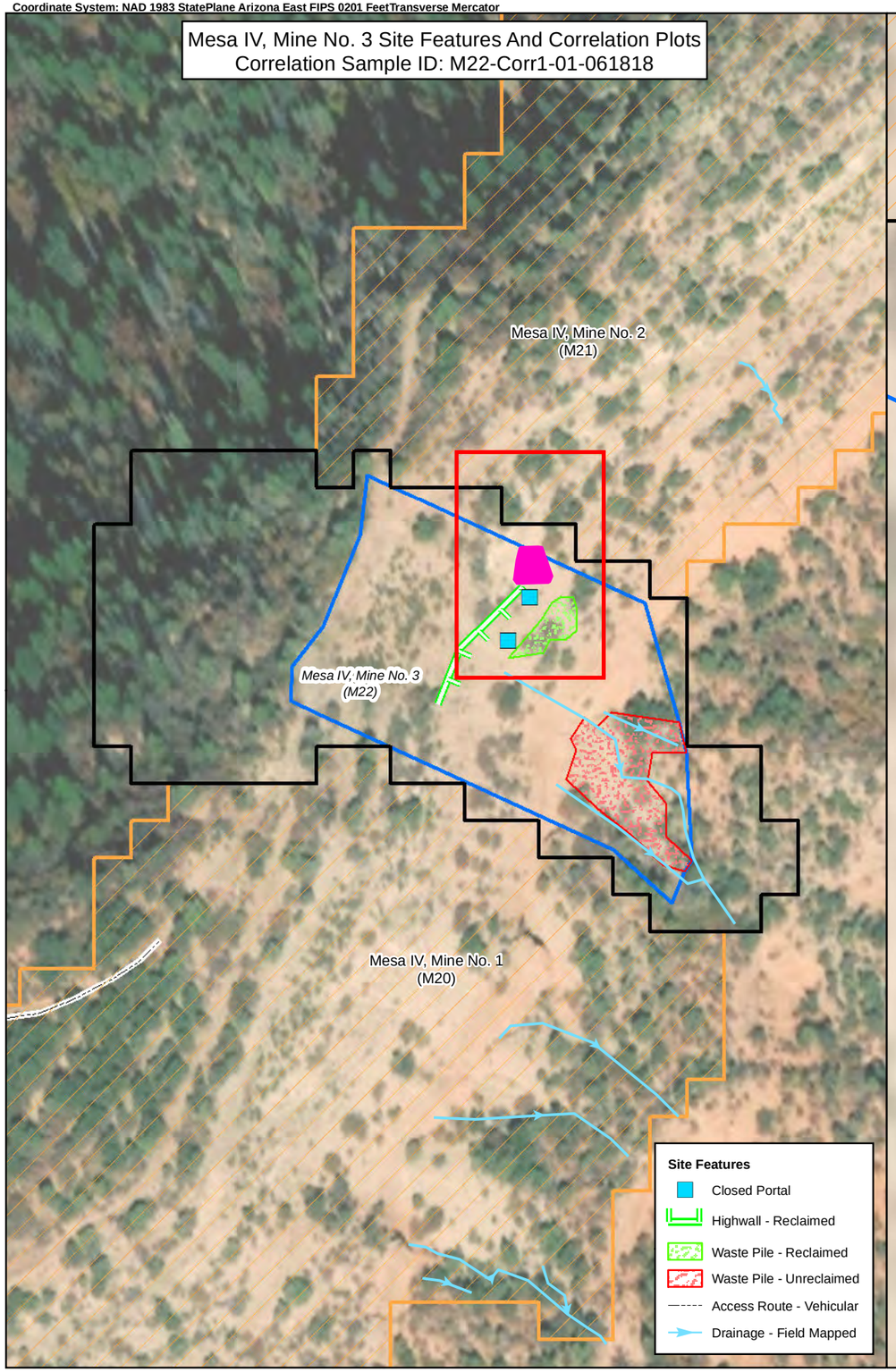
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Morrison lower formation (Jml) geologic unit.

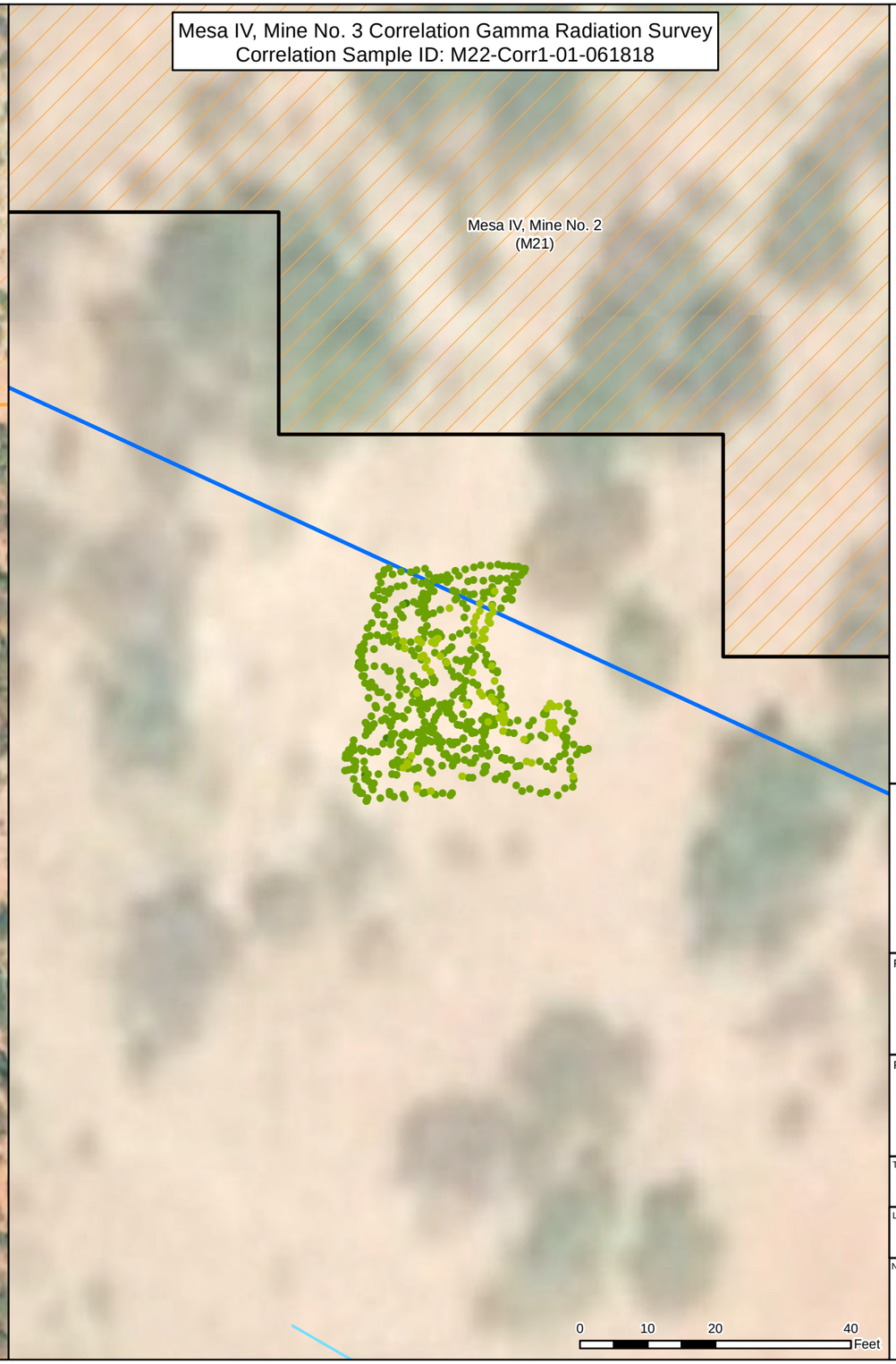
Figure No.: C1-6-9

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa IV, Mine No. 3 Site Features And Correlation Plots
Correlation Sample ID: M22-Corr1-01-061818



Mesa IV, Mine No. 3 Correlation Gamma Radiation Survey
Correlation Sample ID: M22-Corr1-01-061818



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

MESA IV, MINE NO. 3
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

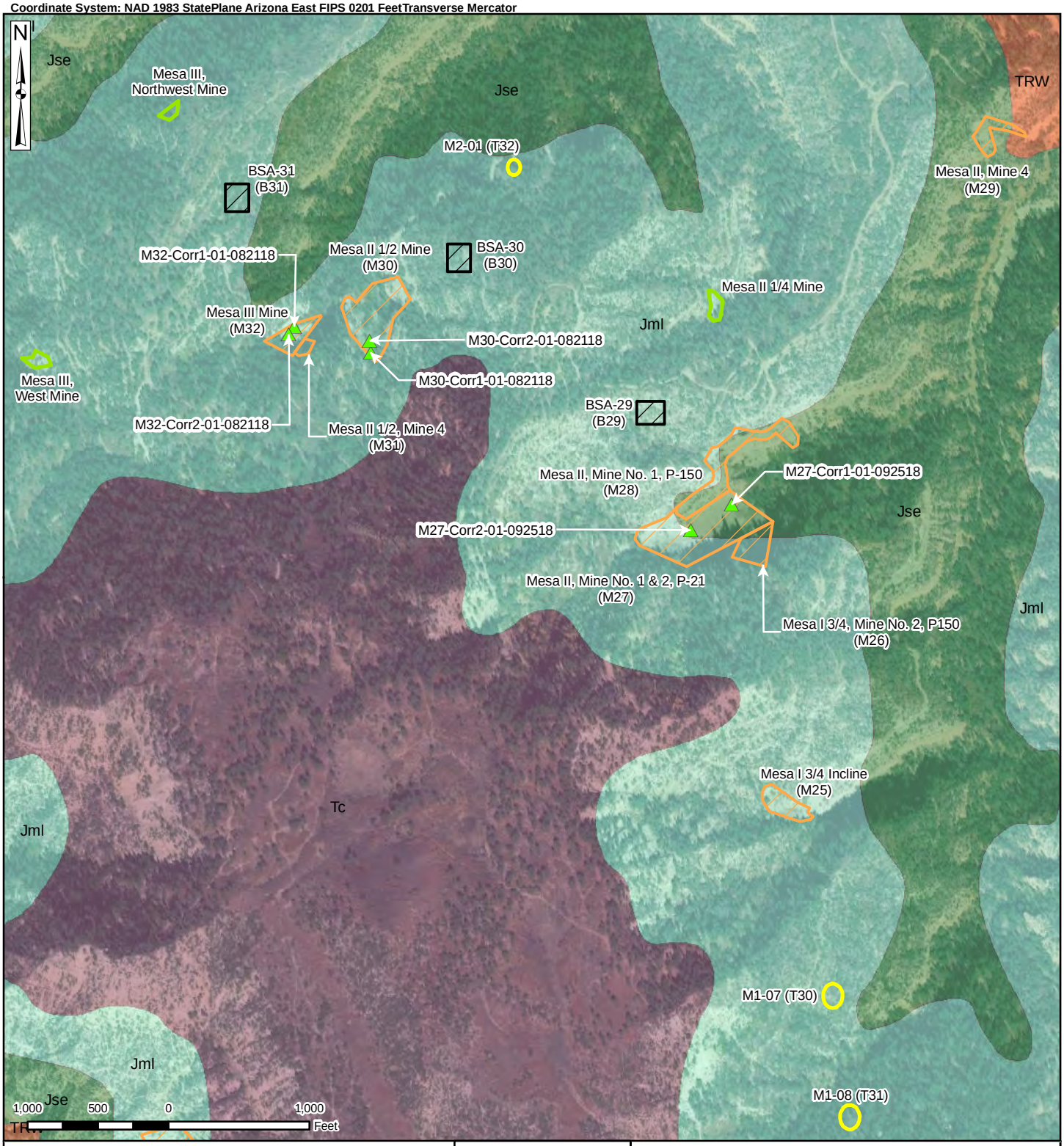
Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-6-10

ATTACHMENT C1-7

GROUP H CORRELATION MAPS AND SCAN DATA

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Correlation Sampling Location

Geologic Units*

- Chuska sandstone - Tc
- Morrison Formation (Lower) - Jml
- Summerville, Entrada Formation (Undifferentiated) - Jse
- Wingate Sandstone - TRW

- Tronox AUM Site Boundary
- Non-AUM Target Site Boundary
- Background Sampling Location
- Non-Tronox AUM Site

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for: U.S. EPA Region 9

Prepared By:

TETRA TECH
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GROUP H CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-7-1
Location: COVE CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa II 1/2 Mine Site Features And Correlation Plots

Middle 2B

Middle 2B

Site Features

- Closed Portal
- Burial Cell
- Waste Pile - Reclaimed
- Waste Pile - Unreclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Mesa II 1/2 Mine Correlation Gamma Radiation Survey

M30-Corr2-01-082118

M30-Corr1-01-082118

Middle 2B

0 10 20 40 Feet

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 110 ft

1:1,320

N W E S

0 55 110 220 Feet

MESA II 1/2 MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Morrison lower formation (Jml) geologic unit.

Figure No.: C1-7-2

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Site Features And Correlation Plots
Correlation Sample ID: M27-Corr1-01-092518

BSA-29
(B29)

Middle 3B

Site Features
- Closed Portal
- Burial Cell
- Waste Pile - Reclaimed
- Mining Infrastructure
- Access Route - Vehicular
- Drainage - Field Mapped

Correlation Gamma Radiation Survey
Correlation Sample ID: M27-Corr1-01-092518

Middle 3B

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Other Survey Area

1 in = 200 ft

1:2,400

N W E S

0 100 200 400 Feet

MESA II, MINE NO. 1 & 2, P-21
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

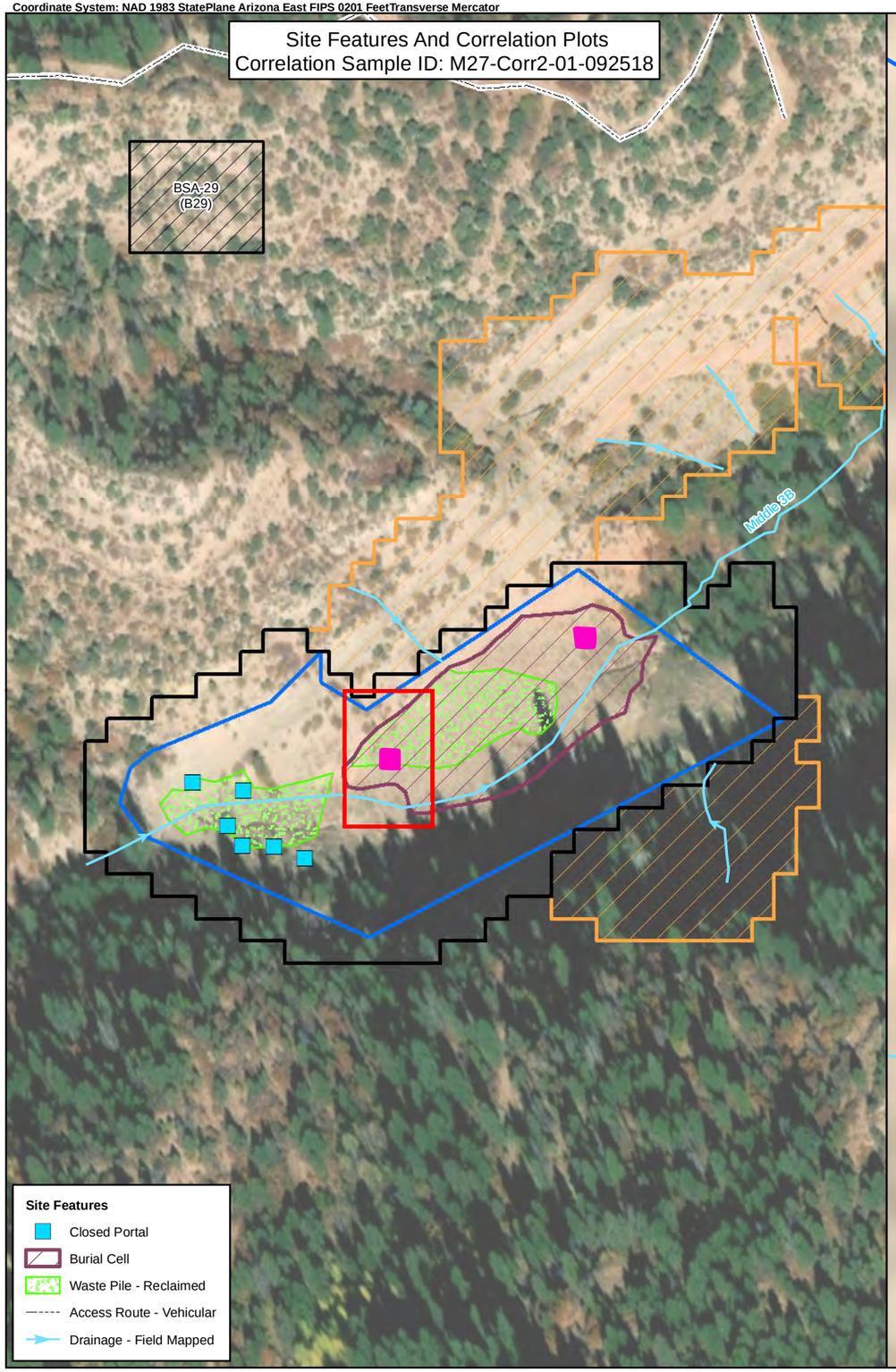
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-7-3

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Site Features And Correlation Plots
Correlation Sample ID: M27-Corr2-01-092518



Site Features
- Closed Portal
- Burial Cell
- Waste Pile - Reclaimed
- Access Route - Vehicular
- Drainage - Field Mapped

Correlation Gamma Radiation Survey
Correlation Sample ID: M27-Corr2-01-092518

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Other Survey Area

1 in = 200 ft

1:2,400

N
W E
S

0 100 200 400 Feet

MESA II, MINE NO. 1 & 2, P-21 CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 2 OF 2

Prepared For:

Prepared By:

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1999 Harrison Street, Suite 500
Oakland, CA 94612

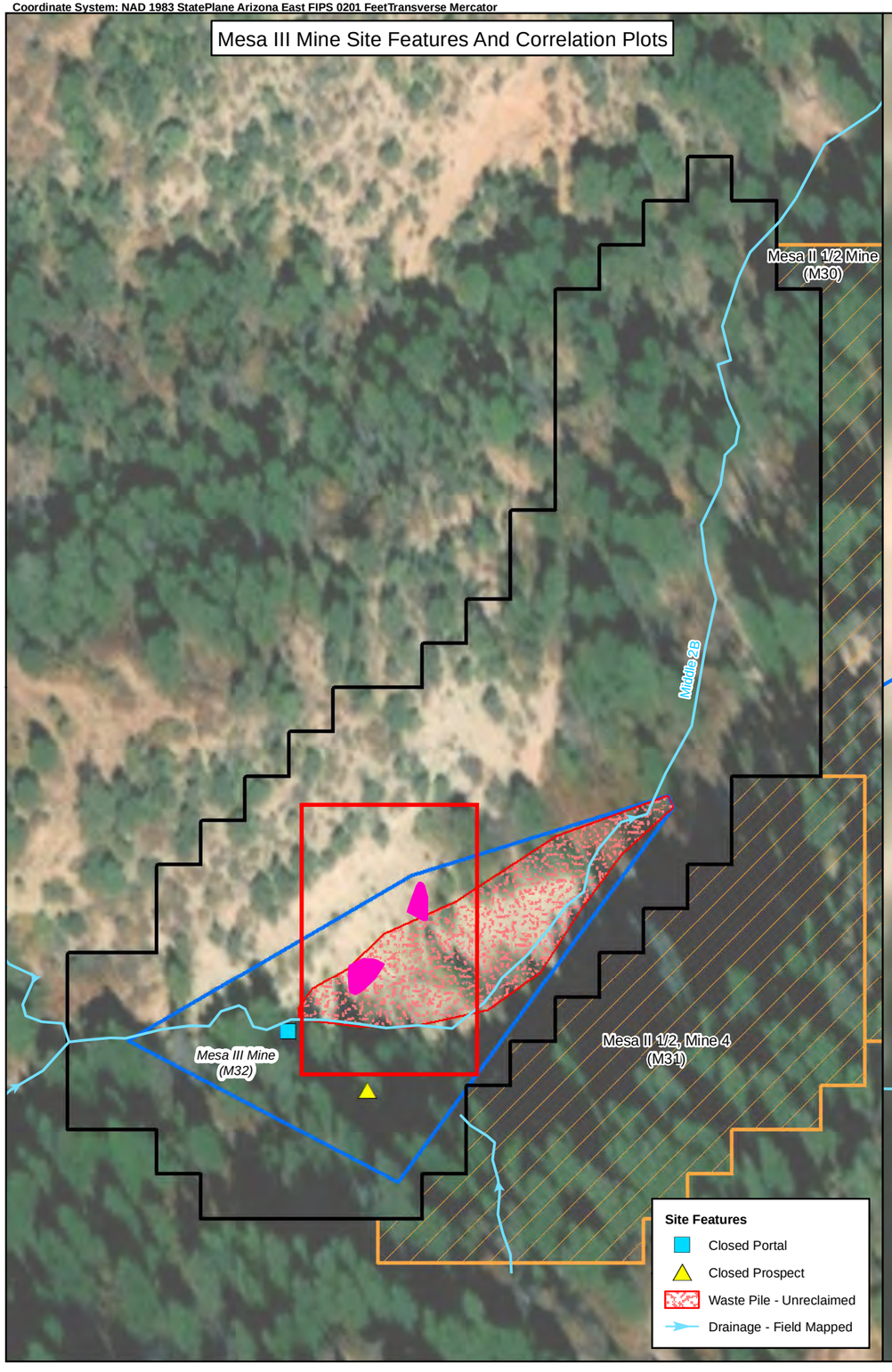
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.:
C1-7-4

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Mesa III Mine Site Features And Correlation Plots



Mesa III Mine Correlation Gamma Radiation Survey

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary
- Other Survey Area

1 in = 100 ft

1:1,200

N
W
E
S

0 50 100 200 Feet

MESA III MINE
CORRELATION PLOTS AND
GAMMA RADIATION SURVEY MAP

Prepared For:

Prepared By:

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Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: COVE CHAPTER NAVAJO NATION	**Date:** 5/24/2019

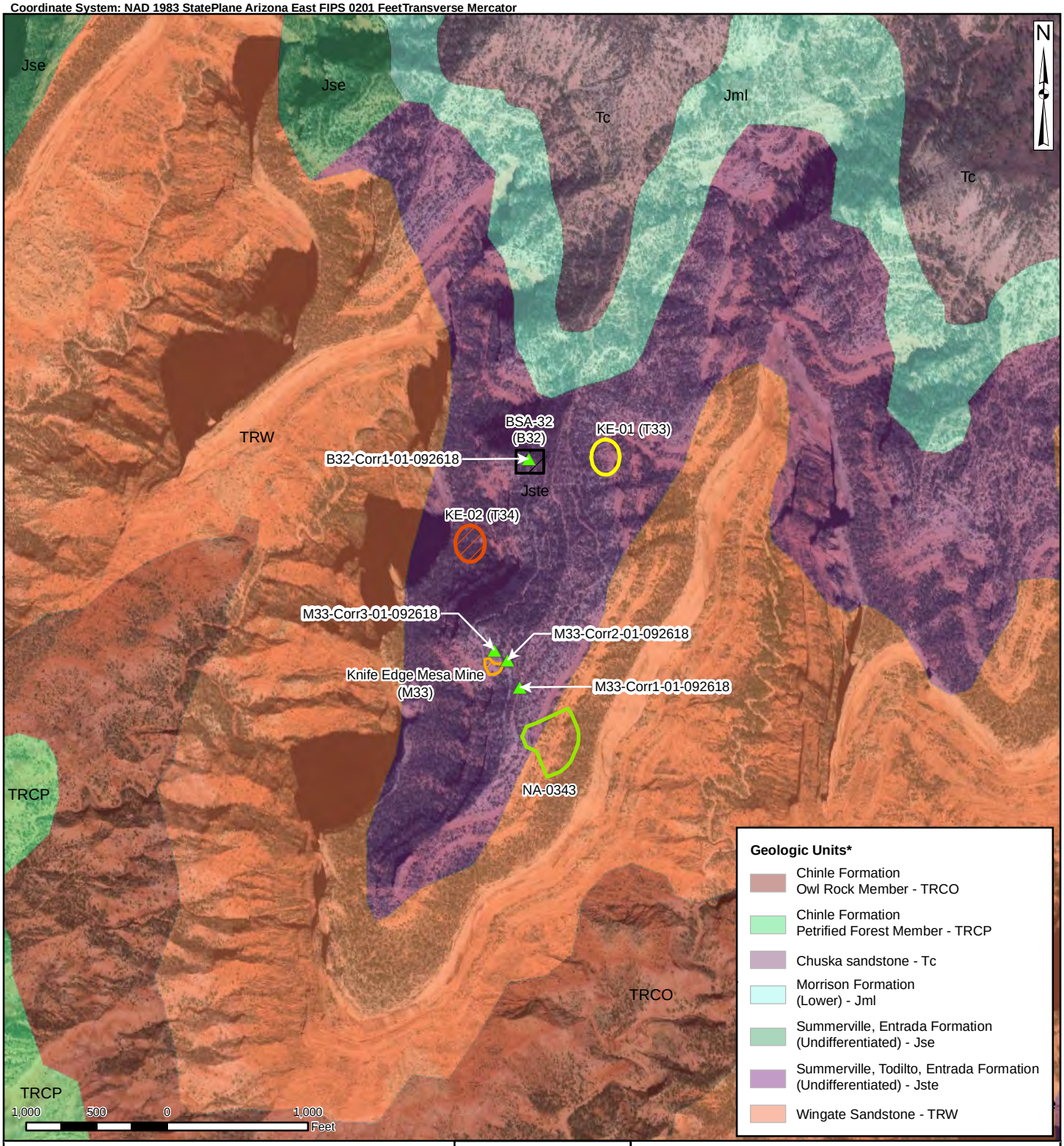
Notes:
*Correlation plot lies within the Morrison lower formation (Jml) geologic unit.

Figure No.: C1-7-5

ATTACHMENT C1-8

GROUP I & J CORRELATION MAPS AND SCAN DATA

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



- Correlation Sampling Location
- Tronox AUM Site Boundary
- Non-AUM Target Site Boundary
- Non-AUM Target Site Boundary *(Inaccessible)*
- Background Sampling Location
- Non-Tronox AUM Site

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for: U.S. EPA Region 9

Prepared By:

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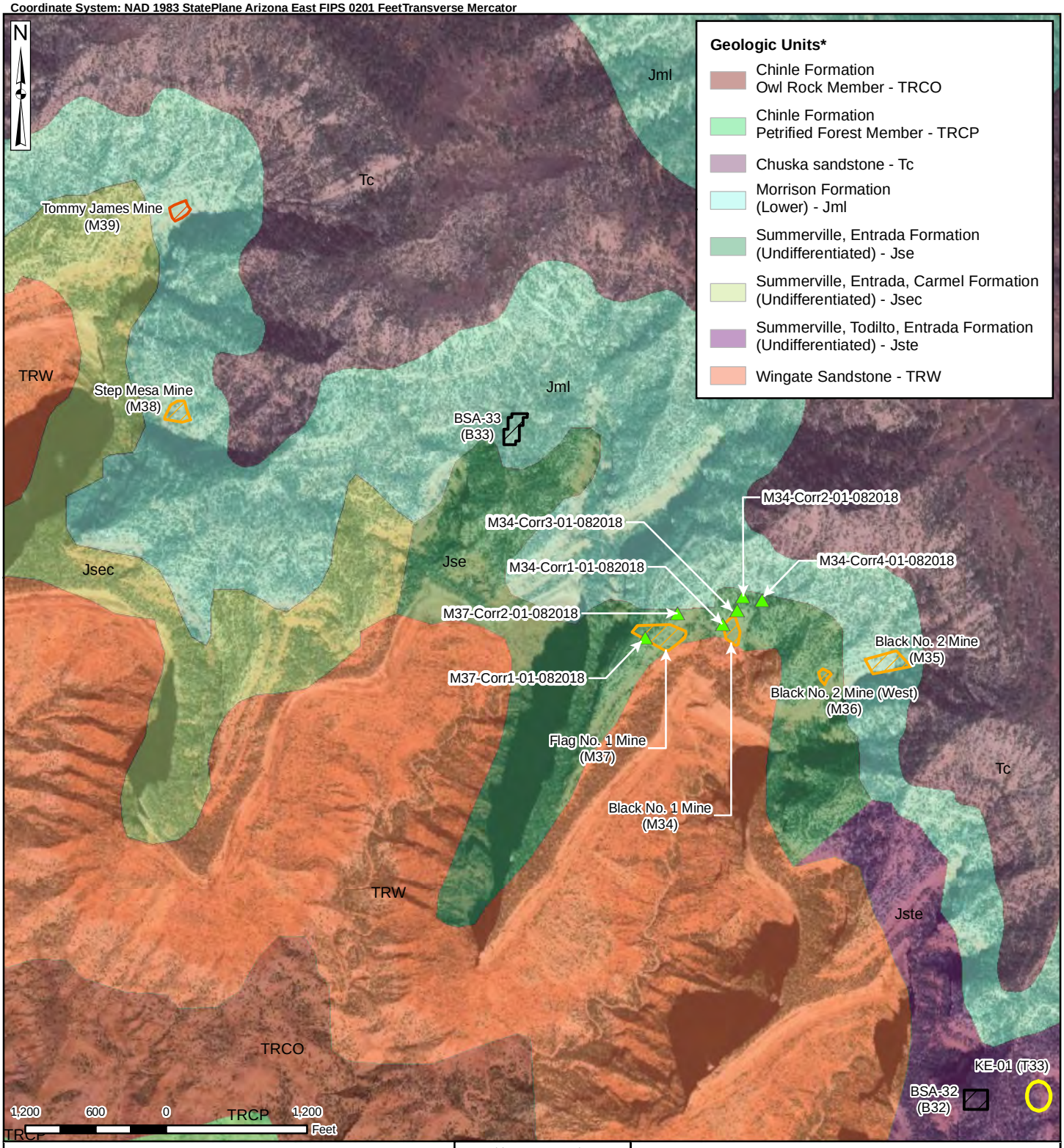
Oakland, CA 94612

GROUP I CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-8-1
Location: LUKACHUKAI CHAPTER NAVAJO NATION	Date: 5/24/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



- Correlation Sampling Location
- Tronox AUM Site Boundary
- Tronox AUM Site Boundary *(Inaccessible)*
- Non-AUM Target Site Boundary
- Background Sampling Location
- Non-Tronox AUM Site

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for: U.S. EPA Region 9

Prepared By:

TETRA TECH
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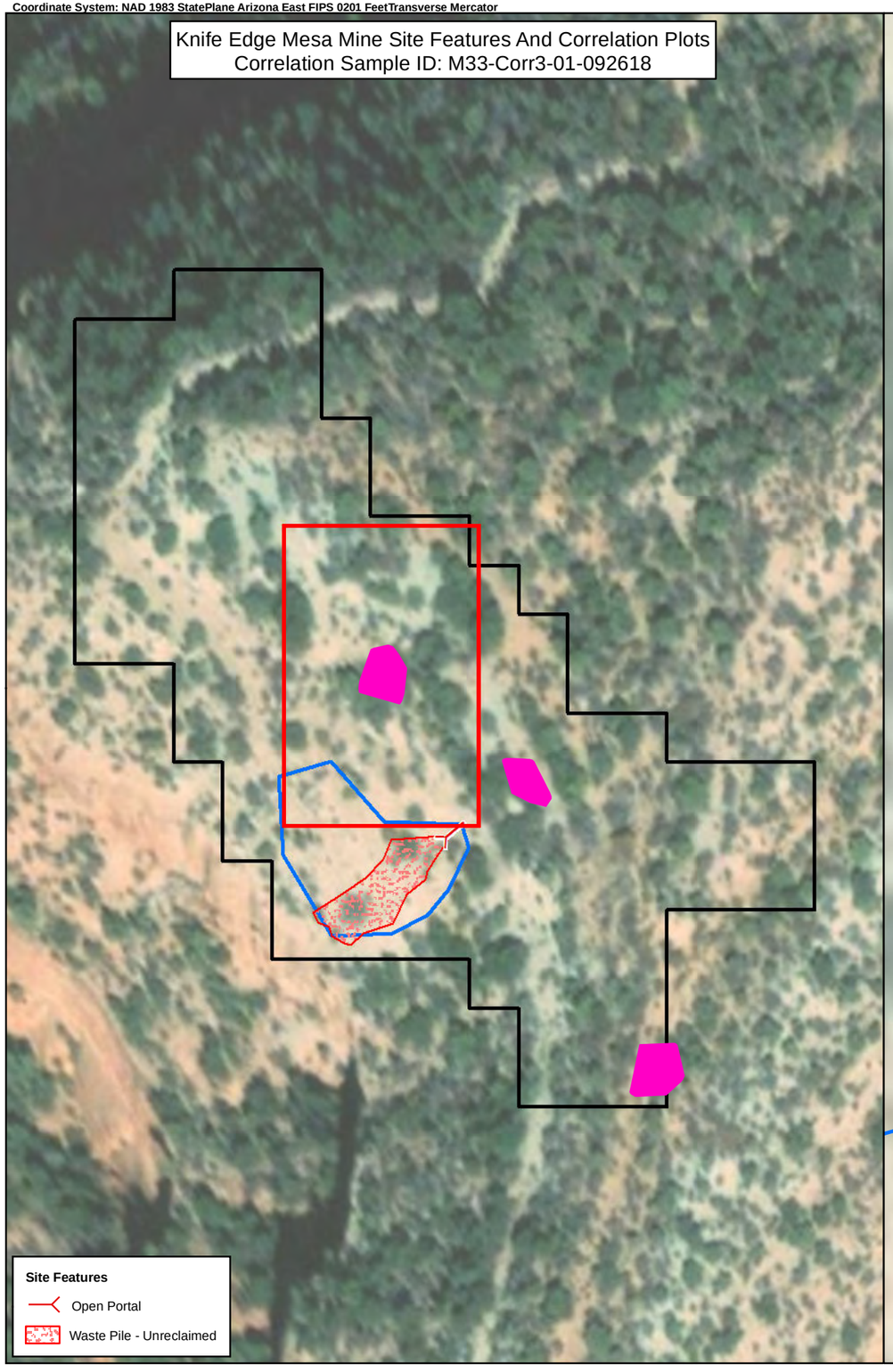
Oakland, CA 94612

GROUP J CORRELATION PLOT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-8-2
Location: LUKACHUKAI CHAPTER NAVAJO NATION	Date: 5/24/2019	

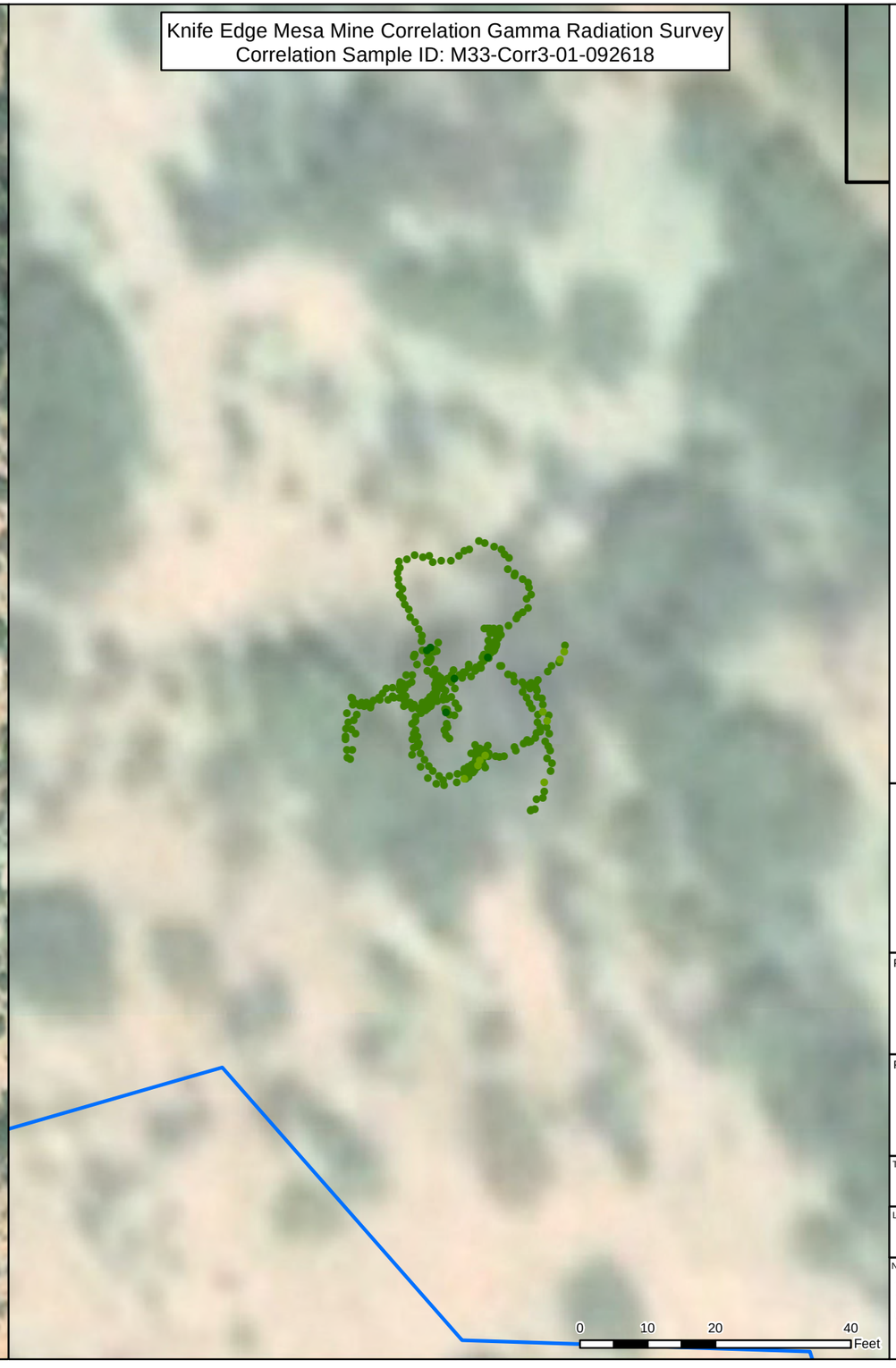
Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Knife Edge Mesa Mine Site Features And Correlation Plots
Correlation Sample ID: M33-Corr3-01-092618



Site Features
- Open Portal
- Waste Pile - Unreclaimed

Knife Edge Mesa Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M33-Corr3-01-092618



Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 90 ft

1:1,080

N
W E
S

0 45 90 180 Feet

KNIFE EDGE MESA MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 1 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Todilto, Entrada undifferentiated formation (Jste) geologic unit.

Figure No.: C1-8-3

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Knife Edge Mesa Mine Site Features And Correlation Plots
Correlation Sample ID: M33-Corr2-01-092618

Knife Edge Mesa Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M33-Corr2-01-092618

Site Features
- Open Portal
- Waste Pile - Unreclaimed

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 90 ft

1:1,080

N W E S

0 45 90 180 Feet

0 10 20 40 Feet

KNIFE EDGE MESA MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 2 OF 3

Prepared For:

Prepared By:

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1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Todilto, Entrada undifferentiated formation (Jste) geologic unit.

Figure No.: C1-8-4

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Knife Edge Mesa Mine Site Features And Correlation Plots
Correlation Sample ID: M33-Corr1-01-092618

Knife Edge Mesa Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M33-Corr1-01-092618

Site Features
- Open Portal
- Waste Pile - Unreclaimed

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 90 ft

1:1,080

N W E S

0 45 90 180 Feet

0 10 20 40 Feet

KNIFE EDGE MESA MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 3 OF 3

Prepared For:

Prepared By:

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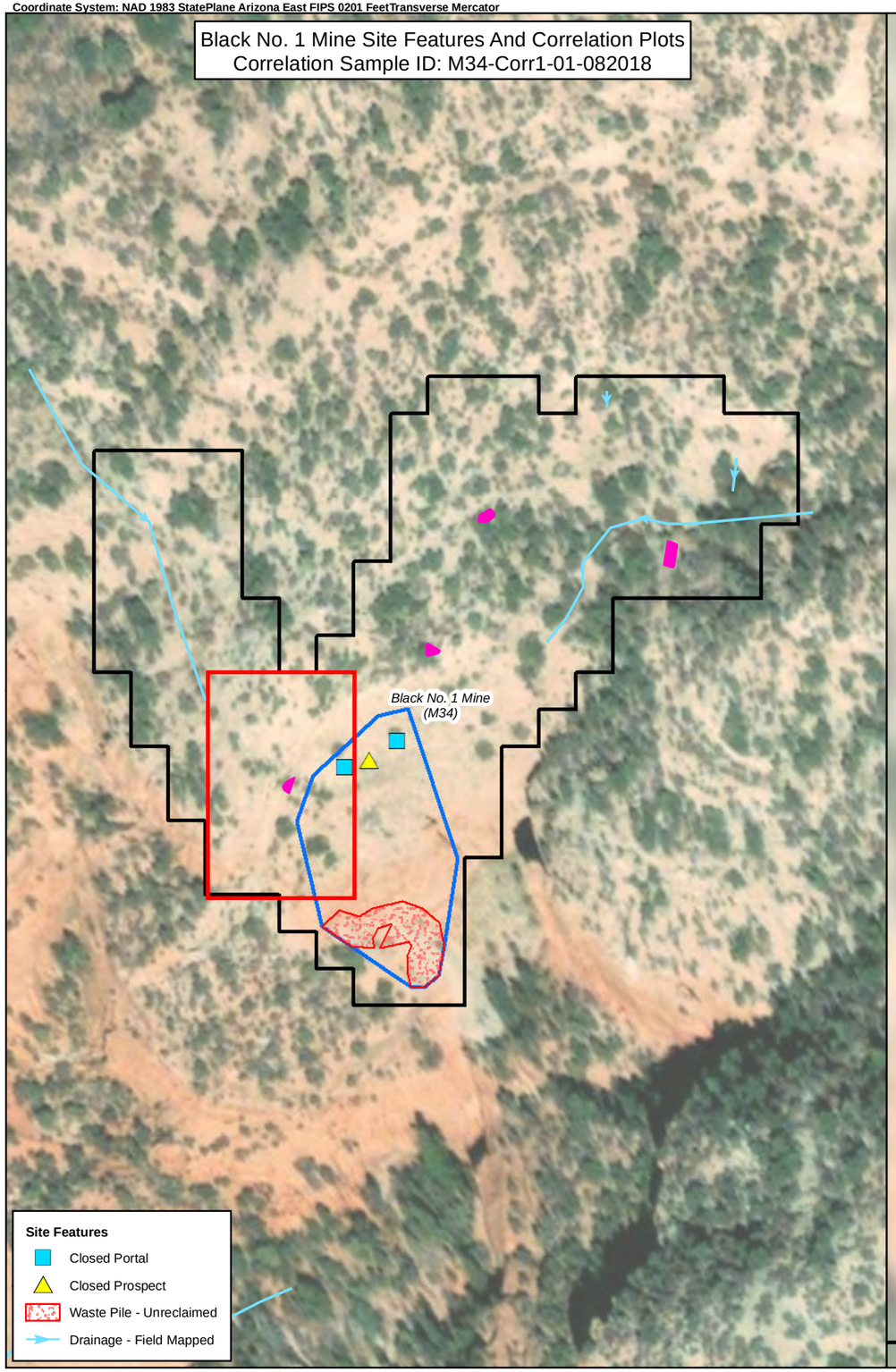
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	Date: 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Todilto, Entrada undifferentiated formation (Jste) geologic unit.

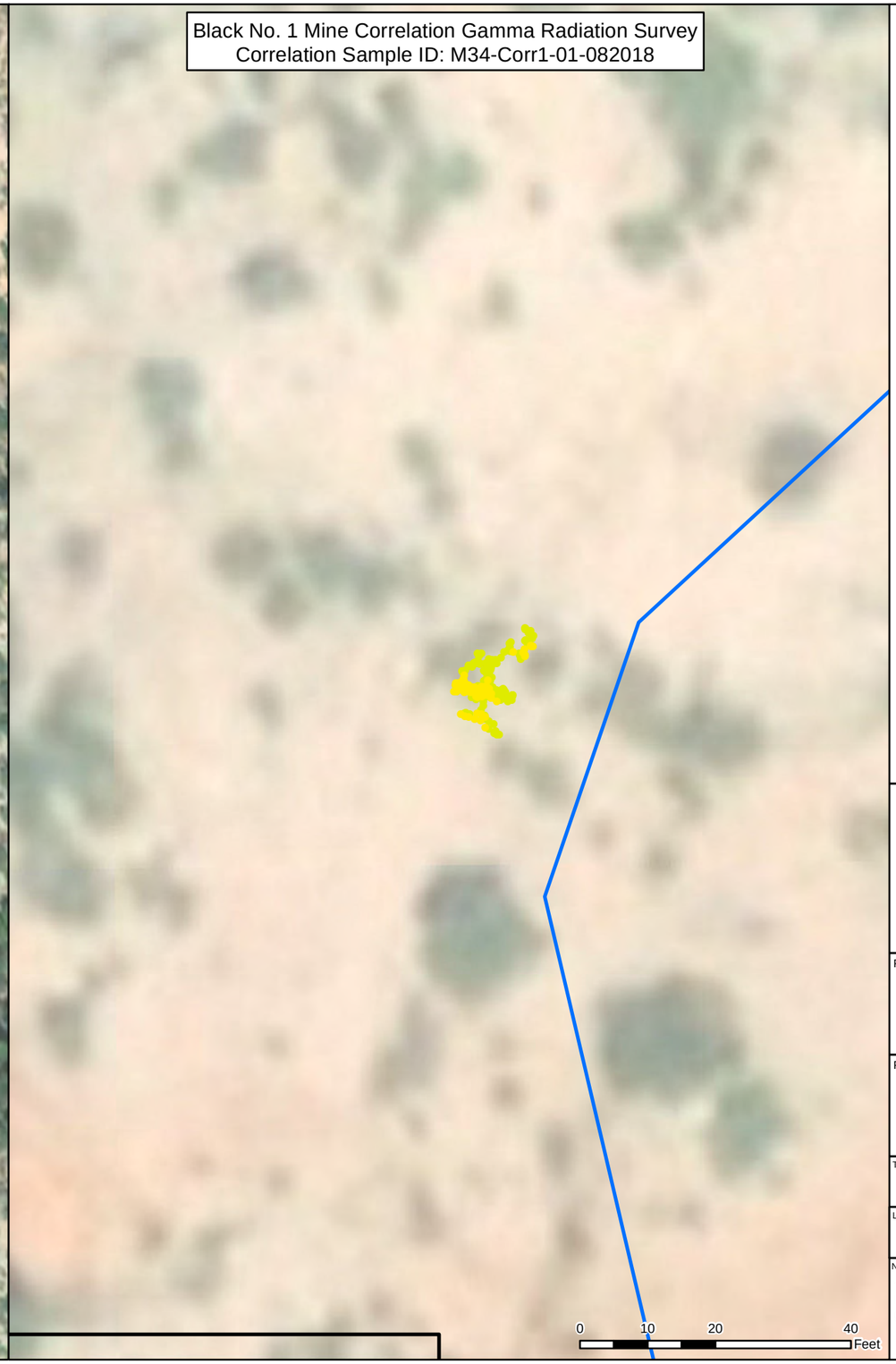
Figure No.: C1-8-5

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Black No. 1 Mine Site Features And Correlation Plots
Correlation Sample ID: M34-Corr1-01-082018



Black No. 1 Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M34-Corr1-01-082018



Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 120 ft

1:1,440

N
W E
S

0 60 120 240 Feet

BLACK NO. 1 MINE
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 1 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.:
C1-8-6

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Black No. 1 Mine Site Features And Correlation Plots

Black No. 1 Mine
(M34)

Site Features
- Closed Portal
- Closed Prospect
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Black No. 1 Mine Correlation Gamma Radiation Survey

M34-Corr2-01-082018

M34-Corr3-01-082018

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 120 ft

1:1,440

N W E S

0 60 120 240 Feet

BLACK NO. 1 MINE
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

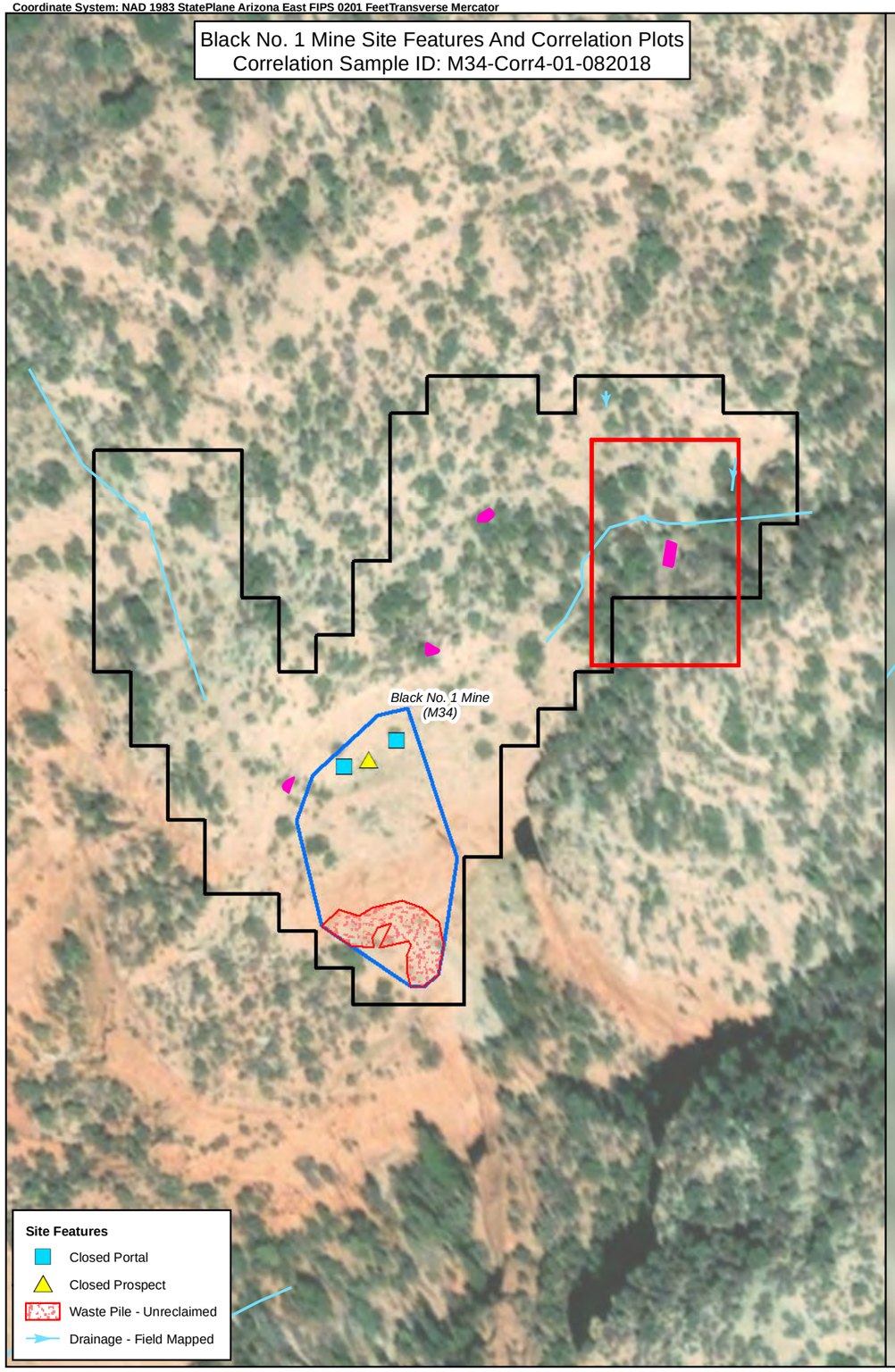
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plots lie within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-8-7

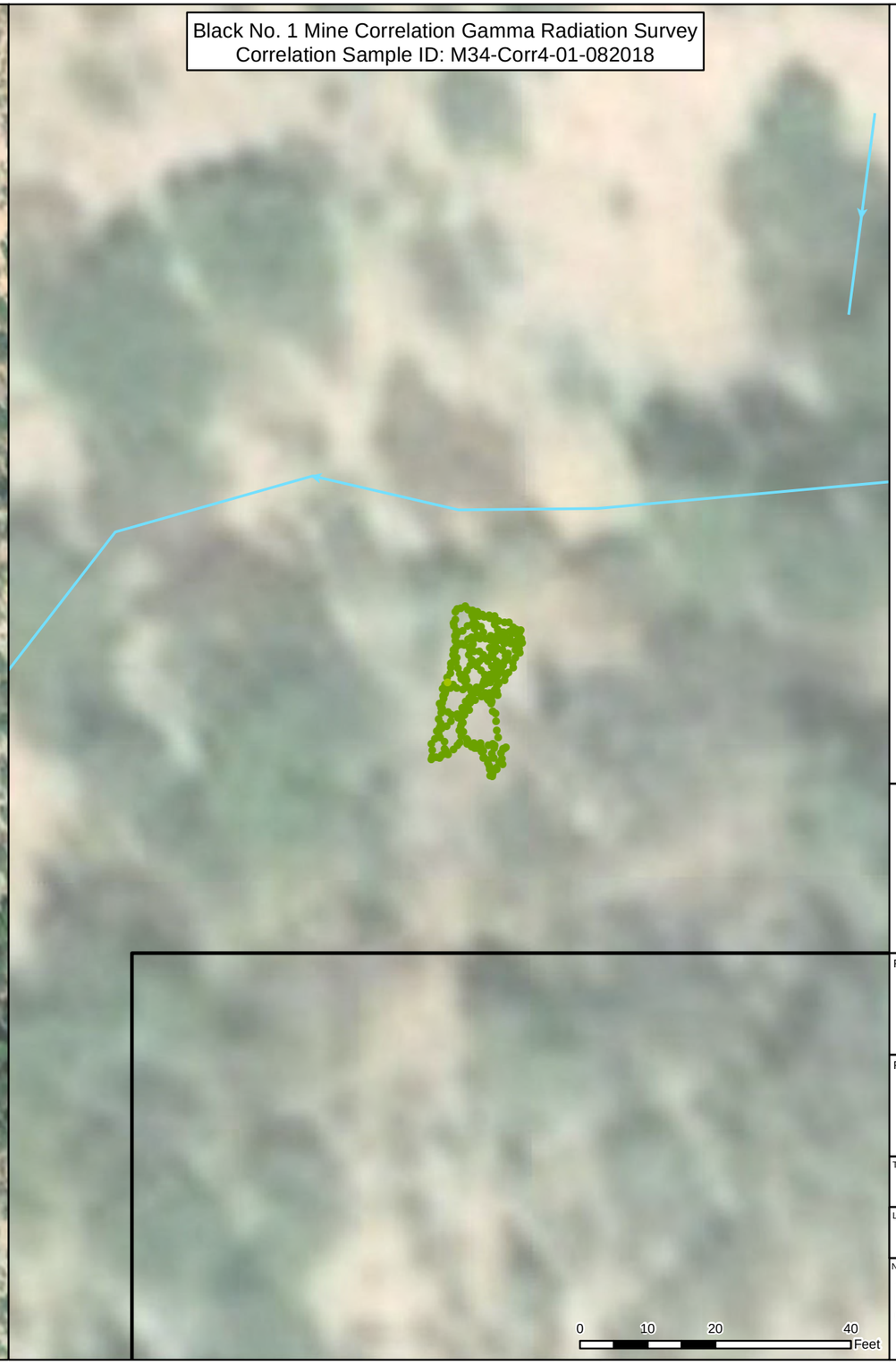
Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Black No. 1 Mine Site Features And Correlation Plots
Correlation Sample ID: M34-Corr4-01-082018



Site Features
- Closed Portal
- Closed Prospect
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Black No. 1 Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M34-Corr4-01-082018



Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 120 ft

1:1,440

N
W E
S

0 60 120 240 Feet

BLACK NO. 1 MINE
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 3 OF 3

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 5/24/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-8-8

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Flag No. 1 Mine Site Features And Correlation Plots
Correlation Sample ID: M37-Corr1-01-082018

Flag No. 1 Mine
(M37)

Site Features
- Closed Portal
- Closed Prospect
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Flag No. 1 Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M37-Corr1-01-082018

0 10 20 40 Feet

Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 100 ft

1:1,200

N W E S

0 50 100 200 Feet

FLAG NO. 1 MINE CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP INSET 1 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

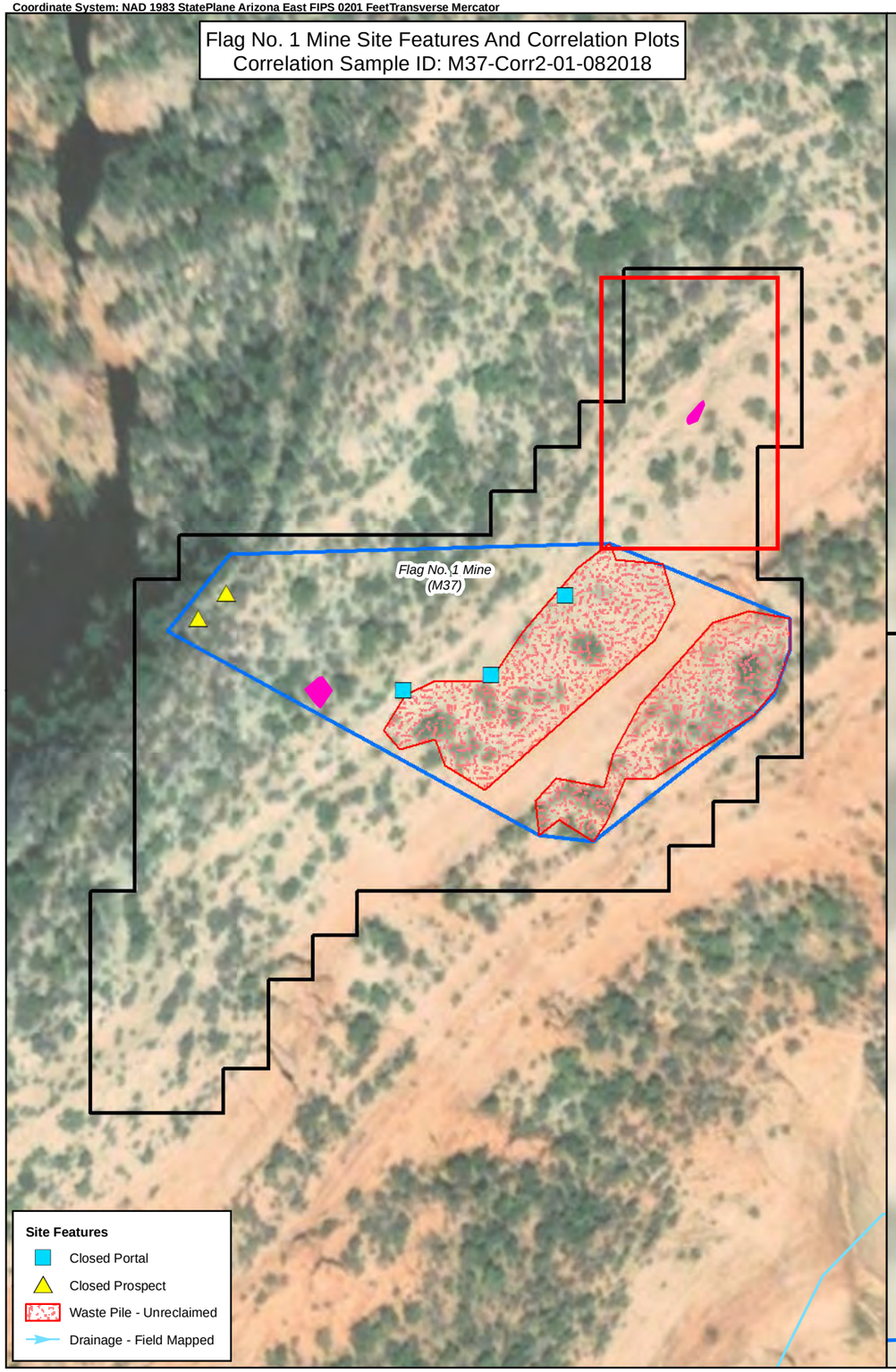
Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 6/9/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-8-9

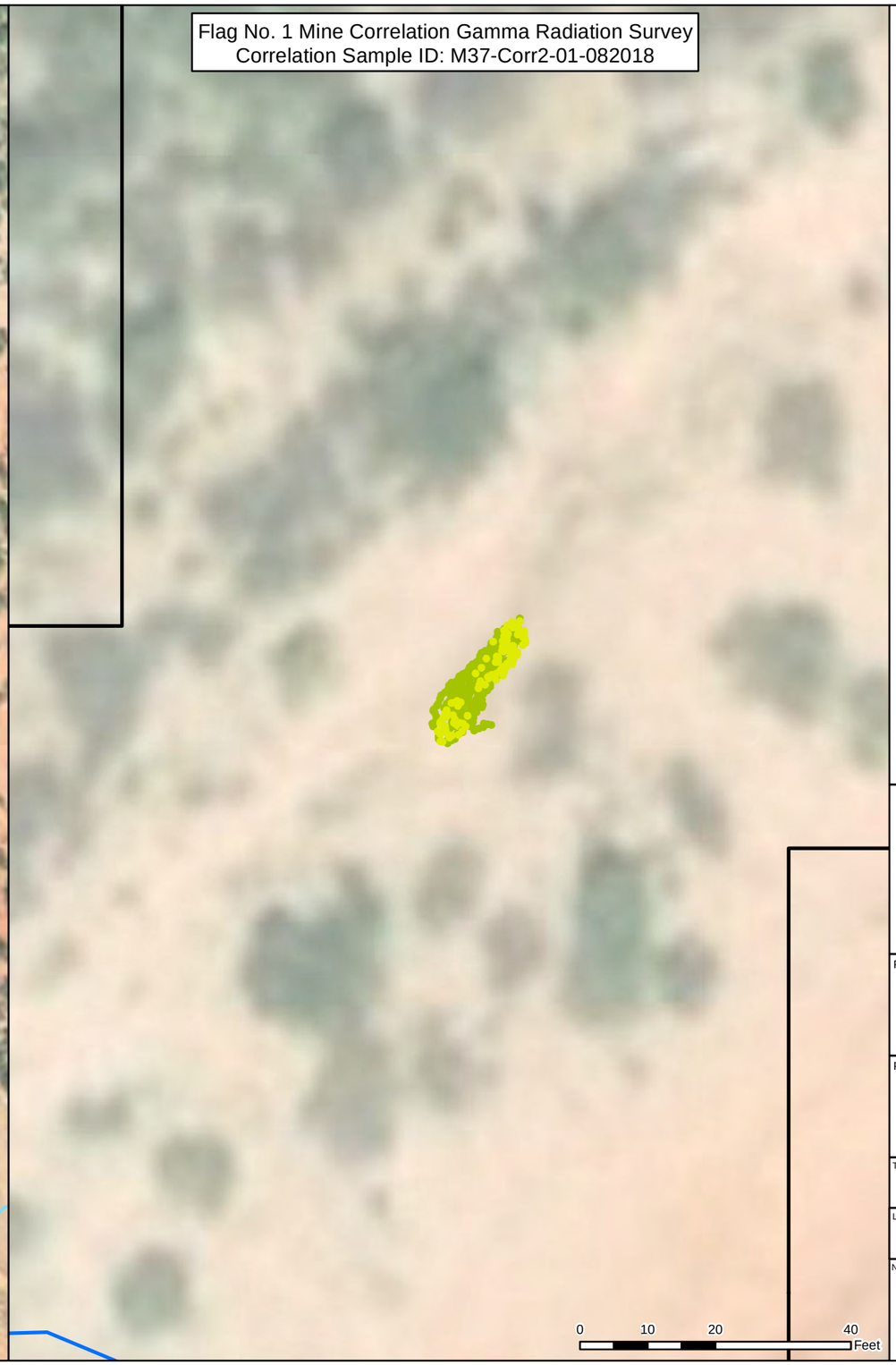
Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Flag No. 1 Mine Site Features And Correlation Plots
Correlation Sample ID: M37-Corr2-01-082018



Site Features
- Closed Portal
- Closed Prospect
- Waste Pile - Unreclaimed
- Drainage - Field Mapped

Flag No. 1 Mine Correlation Gamma Radiation Survey
Correlation Sample ID: M37-Corr2-01-082018



Gamma Reading (cpm)*
- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425
- Extent of Correlation Plot
- AUM Site Boundary
- Survey Area Boundary

1 in = 100 ft

1:1,200

N
W E
S

0 50 100 200 Feet

FLAG NO. 1 MINE
CORRELATION PLOTS AND GAMMA RADIATION SURVEY MAP
INSET 2 OF 2

Prepared For:

Prepared By:

TETRA TECH
1999 Harrison Street, Suite 500
Oakland, CA 94612

Task Order No.:	Contract No.:
TO0001	EP-S9-17-03
Location: LUKACHUKAI CHAPTER NAVAJO NATION	**Date:** 6/9/2019

Notes:
*Correlation plot lies within the Summerville, Entrada undifferentiated formation (Jse) geologic unit.

Figure No.: C1-8-10

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator

Gamma Reading (cpm)*

- 6,186 - 11,337
- 11,338 - 16,018
- 16,019 - 20,845
- 20,846 - 26,428
- 26,429 - 32,491
- 32,492 - 38,915
- 38,916 - 49,327
- 49,328 - 71,795
- 71,796 - 97,972
- 97,973 - 179,425

Background Location

Access Route - Foot

*Correlation plot lies within the Summerville, Todilto, Entrada undifferentiated formation (Jste) geologic unit.

Prepared for: U.S. EPA Region 9

Prepared By:

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Oakland, CA 94612

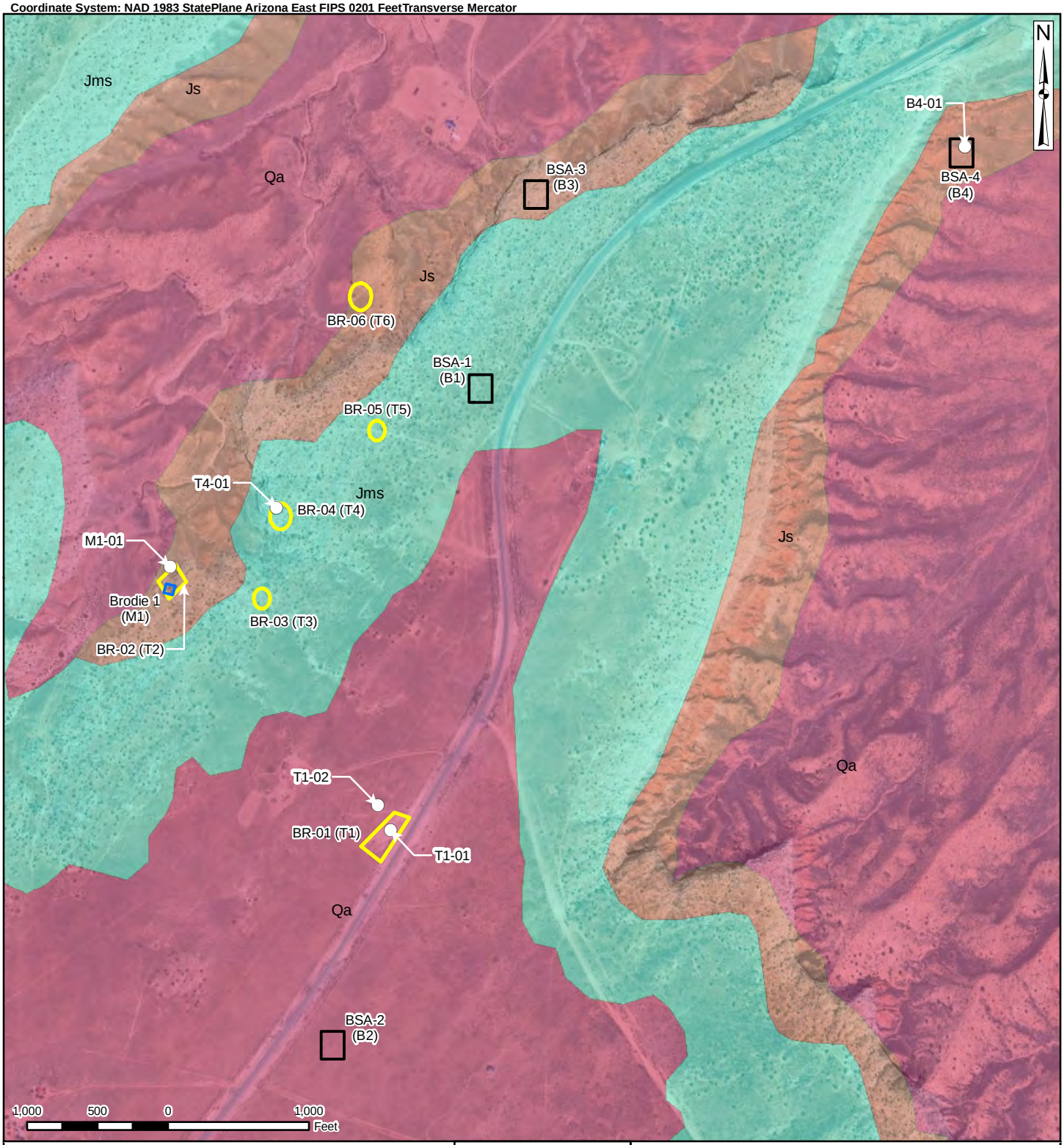
BSA-32 BACKGROUND SITE CORRELATION PLOT AND GAMMA RADIATION SURVEY MAP

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-8-11
Location: COVE CHAPTER NAVAJO NATION	Date: 5/24/2019	

ATTACHMENT C1-9

HPIC MEASUREMENT LOCATIONS

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Geologic Units*

- Alluvium - Qa
- Morrison Formation Salt Wash Member - Jms
- Summerville Formation - Js

- HPIC Measurement Location
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Background Location

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for: USEPA Region 9

Prepared By:

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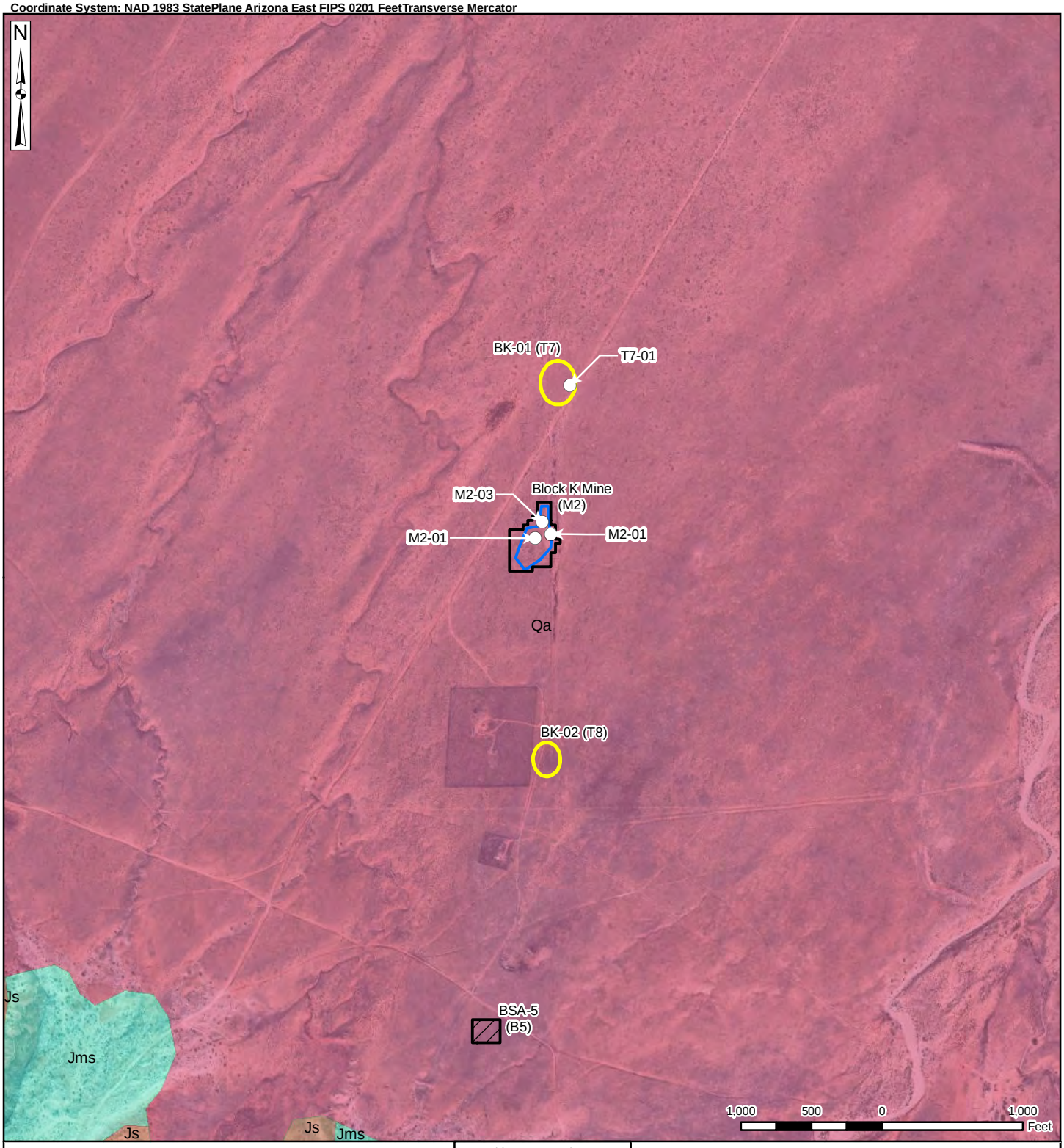
Oakland, CA 94612

GROUP A
HPIC MEASUREMENT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-9-1
Location: SWEETWATER CHAPTER NAVAJO NATION	Date: 6/19/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



Geologic Units*

- Alluvium - Qa
- Morrison Formation Salt Wash Member - Jms
- Summerville Formation - Js

- HPIC Measurement Location
- AUM Site Boundary
- Non-AUM Target Site Boundary
- Related Survey Area
- Background Location

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for: USEPA Region 9

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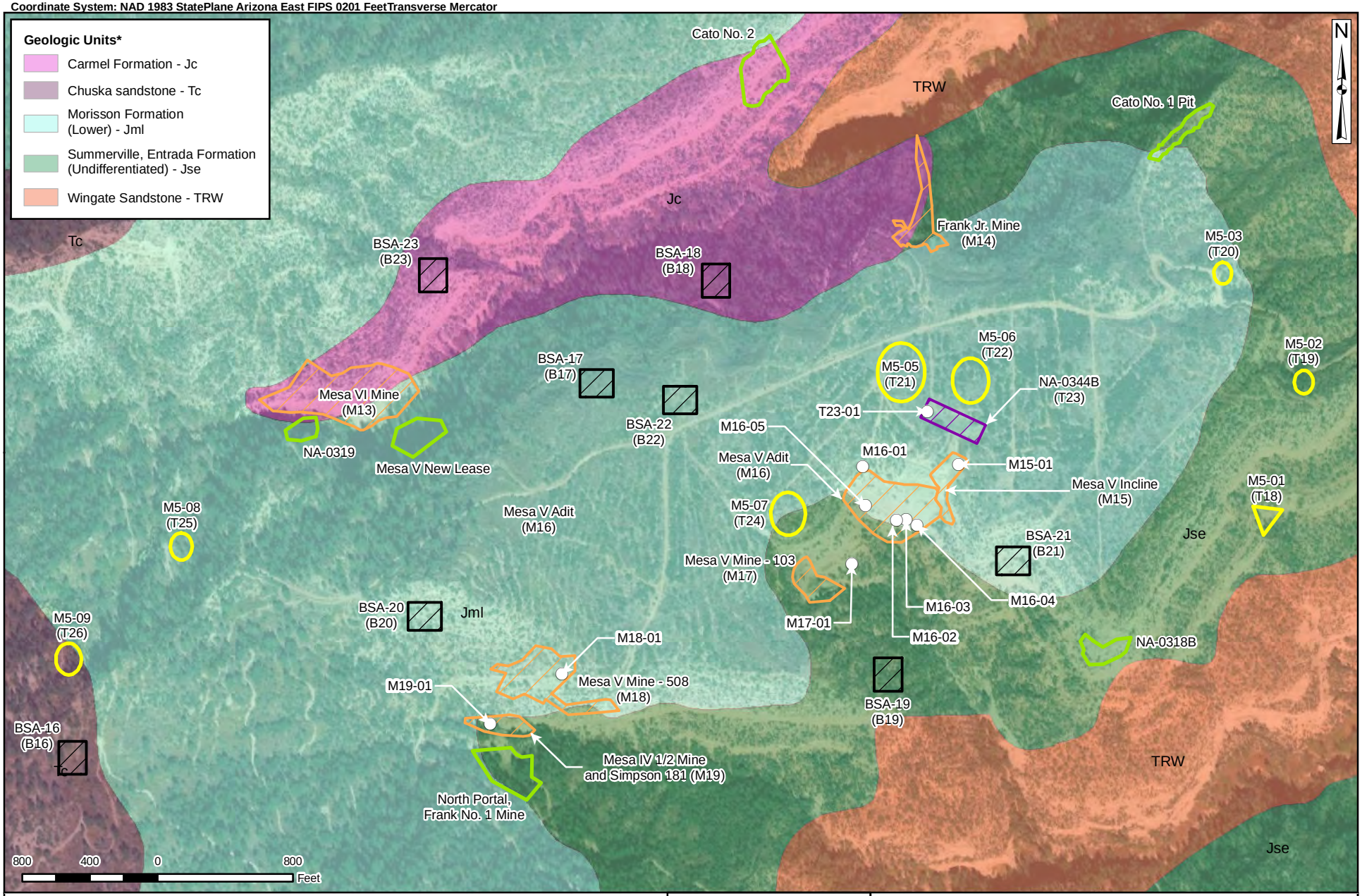
GROUP B
HPIC MEASUREMENT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-9-2
Location: TEEC NOS POS CHAPTER NAVAJO NATION	Date: 6/19/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

Prepared for:

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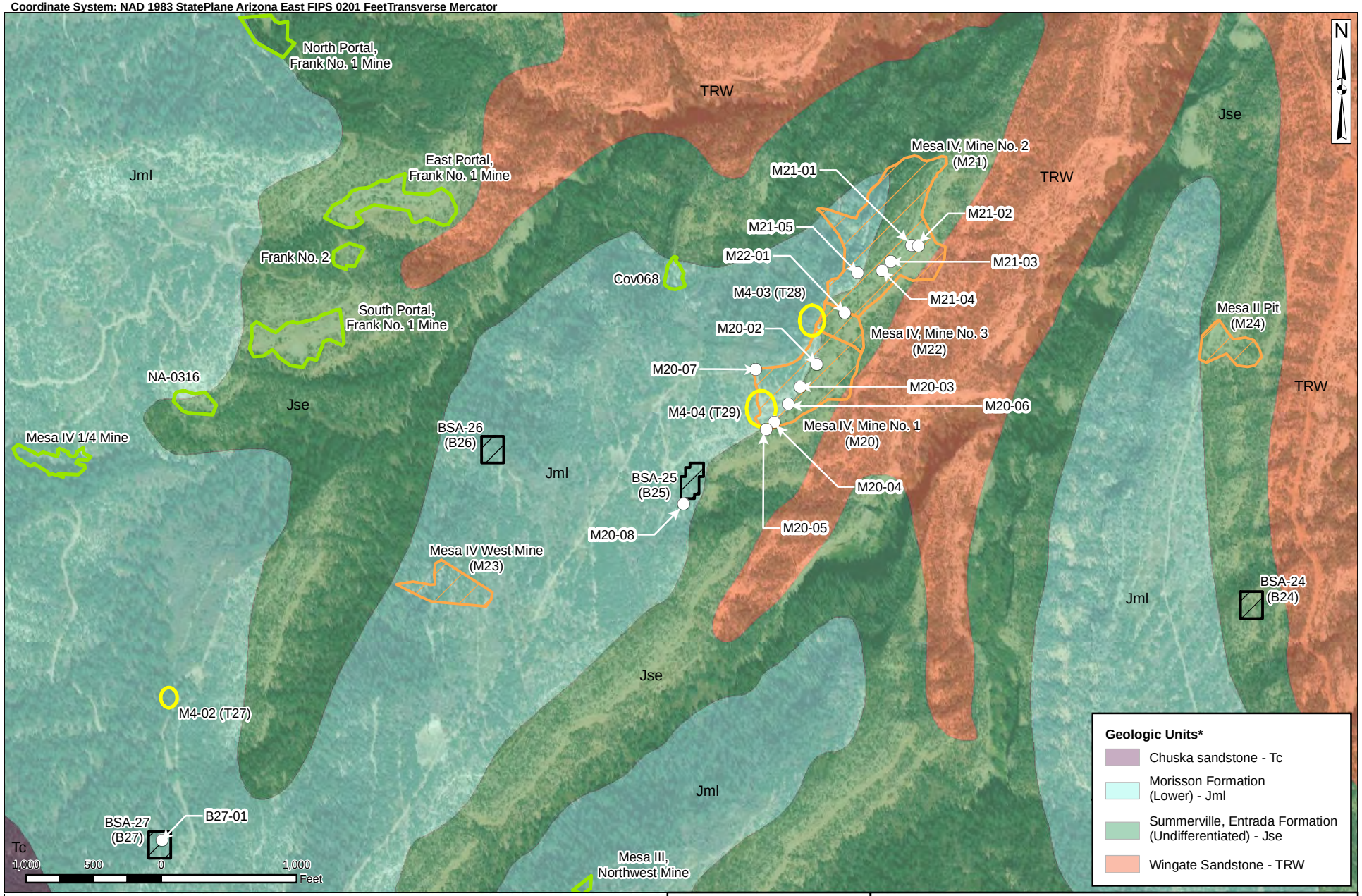
GROUP F
HPIC MEASUREMENT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-9-3
Location: COVE CHAPTER NAVAJO NATION	Date: 6/21/2019	

Coordinate System: NAD 1983 StatePlane Arizona East FIPS 0201 FeetTransverse Mercator



HPIC Measurement Location

Tronox AUM Site Boundary

Non-AUM Target Site Boundary

Background Sampling Location

Non-Tronox AUM Site

*O'Sullivan, R.B., and Beikman, H.M. (1963). *Geology, structure, and uranium deposits of the Shiprock quadrangle, New Mexico and Arizona* . Accessed 01/10/2018. https://ngmdb.usgs.gov/Prodesc/proddesc_1389.htm

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GROUP G
HPIC MEASUREMENT LOCATIONS

Task Order No.:	Contract No.:	Figure No.:
TO0001	EP-S9-17-03	C1-9-4
Location: COVE CHAPTER NAVAJO NATION	Date: 6/19/2019	

ATTACHMENT C2

CORRELATION DATA TABLES

Table C2-1. Gamma Count Rates and Associated Concentrations of Radium-226, Thorium-232, and Potassium-40 in Samples of Surface Soils Obtained in the Jml Correlation Study

Sample ID	Date of Collection	Gamma Count Rate (cpm)			Ra-226 (pCi/g)		Thorium-232 (pCi/g)		Potassium-40 (pCi/g)	
		Mean	Minimum	Maximum	Result	TPU	Result	TPU	Result	TPU
B27-Corr1-01-061918	06/19/2018	9590.874517	7719	11675	0.63	0.21	0.76	0.42	18	3.5
M15-Corr1-01-060418	06/04/2018	16506.52811	11267	22187	5.48	0.78	0.86	0.53	21.4	4.5
M16-Corr1-01-060418	06/05/2018	31124.8125	26560	36914	11.1	1.4	0.47	0.39	13.3	3
M16-Corr2-01-060418	06/04/2018	24178.74144	19549	30235	13.5	1.6	0.79	0.41	16.1	2.7
M16-Corr3-01-060518	06/04/2018	36277.704	30303	44202	18.7	2.4	0.21	0.67	16.8	3.9
M16-Corr4-01-060518	06/05/2018	57365.87624	38736	69046	29.2	3.6	0.31	0.88	9.4	3.7
M16-Corr5-01-060518	06/05/2018	56172.62548	45661	75335	29.5	3.5	-0.41	0.66	13.6	3.3
M16-Corr6-01-060518	06/05/2018	94728.81985	61686	179425	49.3	5.9	0	1	12.6	4.1
M18-Corr1-01-060418	06/04/2018	8984.813953	7317	11802	0.87	0.18	0.23	0.26	14.6	2.4
M20-Corr4-01-061918	06/19/2018	8246.673721	6566	10061	0.42	0.17	0.56	0.42	12.1	2.9
M21-Corr4-01-061818	06/18/2018	13866.83405	11407	16852	4.36	0.64	0.6	0.54	10.7	3.2
M3-Corr1-01-051018	05/10/2018	14201.49689	12514	16050	2.72	0.46	-0.06	0.46	11.7	3.3
M30-Corr1-01-082118	08/21/2018	17672.13765	15605	20251	1.95	0.37	0.11	0.48	16.4	3.5
M30-Corr2-01-082118	08/21/2018	14577.94472	12375	16854	2.12	0.43	0.79	0.58	15.1	3.7
M32-Corr1-01-082118	08/21/2018	29808.87069	25732	37535	4.57	0.64	0.46	0.46	13.5	3.1
M32-Corr2-01-082118	08/21/2018	39242.9117	31947	47499	18	2.2	0.14	0.39	16.7	2.9
M4-Corr1-01-050918	05/09/2018	13319.40323	11006	15863	2.99	0.49	0.33	0.47	16.6	4
M4-Corr2-01-050918	05/09/2018	35431.83168	29775	39491	12.9	1.6	0.29	0.63	12.1	3.2
M5-Corr1-01-050918	05/09/2018	18776.59259	15372	22184	4.52	0.63	0.12	0.42	9.1	2.4
M6-Corr2-01-050918	05/09/2018	41118.15972	35766	45938	12.7	1.6	0.2	0.56	12.9	3.3
M7-Corr2-01-051018	05/10/2018	12173.60989	9602	13692	2.99	0.49	0.77	0.57	11.2	3.3
M7-Corr3-01-051018	05/10/2018	18909.48701	16408	21471	7	0.94	1.41	0.54	23.1	4.3
M7-Corr1-01-051018	05/10/2018	37108.87681	32172	40602	12.6	1.6	0.47	0.67	12.1	3.9
M8-Corr1-01-050918	05/09/2018	26057.29008	23034	29929	6.71	0.87	1.01	0.42	24.7	4.3
* M8-Corr2-01-050918	05/09/2018	49212.62162	41453	65583	8.4	1.1	2.02	0.51	21.2	3.9
T17-Corr1-01-050918	05/09/2018	10181.80423	8509	12333	1.27	0.3	0.94	0.56	16.8	3.8
T23-Corr1-01-060418	06/04/2018	11916.98287	9752	14563	2.39	0.43	0.87	0.56	14.7	3.5

Notes:
* Outlier sample removed from regression analysis.
cpm counts per minute
Jml Lower Morrison Formation
pCi/g picocuries per gram
TPU total propagated uncertainty

Table C2-2. Gamma Count Rates and Associated Concentrations of Radium-226, Thorium-232, and Potassium-40 in Samples of Surface Soils Obtained in the Jse & Jste Correlation Study

Sample ID	Date of Collection	Gamma Count Rate (cpm)			Ra-226 (pCi/g)		Thorium-232 (pCi/g)		Potassium-40 (pCi/g)	
		Mean	Minimum	Maximum	Result	TPU	Result	TPU	Result	TPU
B32-Corr1-01-092618	09/26/2018	8389.477778	6376	11708	0.59	0.21	0.35	0.39	7.2	2.4
M17-Corr1-01-060518	06/05/2018	17422.72595	14221	21948	0.75	0.22	0.67	0.44	14.2	3.2
M19-Corr1-01-060418	06/04/2018	21798.77839	17064	27547	8.5	1.1	0.55	0.6	15	4
M20-Corr2-01-061818	06/18/2018	11550.08263	9267	14246	1.75	0.37	0.97	0.66	18.7	4.5
M20-Corr1-01-061818	06/18/2018	22838.56176	16377	30133	7.2	0.97	0.38	0.43	11.6	3.1
M20-Corr3-01-061918	06/19/2018	33081.62064	26929	51055	19	2.3	0.86	0.57	16.2	3.4
* M21-Corr1-01-061818	06/18/2018	29931.8903	23512	40706	6.86	0.93	0.24	0.43	9.7	2.9
M21-Corr3-01-061818	06/18/2018	22673.3002	17845	28108	10.4	1.3	0.44	0.52	18	3.5
M21-Corr2-01-061818	06/18/2018	27281.83562	22228	33377	12.2	1.5	0.45	0.26	18.7	3
M22-Corr1-01-061818	06/18/2018	19042.37229	14669	24809	7.7	1	-0.05	0.46	11.4	3
M27-Corr2-01-092518	09/25/2018	22276.84156	19751	25921	4.64	0.68	-0.02	0.46	13.3	3.5
M27-Corr1-01-092518	09/25/2018	31211.36458	26163	38308	13.4	1.7	0.22	0.56	14.9	3.4
M33-Corr1-01-092618	09/26/2018	8638.654611	6506	11274	0.64	0.22	0.09	0.35	8.9	2.6
M33-Corr3-01-092618	09/26/2018	13718.46174	10817	18191	4.71	0.68	0.24	0.52	11.8	3.2
M33-Corr2-01-092618	09/26/2018	21646.62313	17704	26014	9.9	1.3	0.84	0.45	20.2	3.8
M34-Corr4-01-082018	08/20/2018	18566.26531	16855	21156	3.32	0.51	0.49	0.42	13.2	3.1
M34-Corr2-01-082018	08/20/2018	23375.35426	21050	25587	9.7	1.3	0.84	0.47	10.9	3.1
M34-Corr3-01-082018	08/20/2018	42128.08306	37492	46632	20	2.4	0.57	0.43	13.6	2.6
M34-Corr1-01-082018	08/20/2018	31889.17959	27072	38130	23.4	2.9	1.02	0.77	16.1	4.1
M37-Corr1-01-082018	08/20/2018	14900.95489	12741	17581	2.43	0.36	0.52	0.21	15.9	2.7
M37-Corr2-01-082018	08/20/2018	25657.78827	22549	28341	10.9	1.5	0.56	0.59	13.6	3.6

Notes:
* Outlier sample removed from regression analysis.
cpm counts per minute
Jse Summerville Entrada Formation
Jste Undifferentiated Summerville, Todilto, and Entrada Formations
pCi/g picocuries per gram
TPU total propagated uncertainty

Table C2-3. Gamma Count Rates and Associated Concentrations of Radium-226, Thorium-232, and Potassium-40 in Samples of Surface Soils Obtained in the Tse Tah Region Correlation Study

Sample ID	Date of Collection	Gamma Count Rate (cpm)			Ra-226 (pCi/g)		Thorium-232 (pCi/g)		Potassium-40 (pCi/g)	
		Mean	Minimum	Maximum	Result	TPU	Result	TPU	Result	TPU
B4-Corr1-01-081918	08/19/2018	7930.135076	6877	9386	0.56	0.19	0.5	0.43	11.9	2.8
M1-Corr1-01-081918	08/19/2018	10125.73558	8579	11686	1.5	0.29	0.41	0.31	9.9	2.6
M2-Corr1-01-081918	08/19/2018	11545.63549	8188	15547	6.1	0.77	0.31	0.26	13.6	2.3
M2-Corr2-01-081918	08/19/2018	9548.773134	7667	11568	3.72	0.56	0.38	0.34	12	3
M2-Corr3-01-081918	08/19/2018	7832.874302	6684	9318	0.92	0.25	0.75	0.48	11.5	3.1
T1-Corr1-01-081918	08/19/2018	14565.43231	13157	16161	2.52	0.41	0.1	0.36	11	2.6
* T1-Corr2-01-081918	08/19/2018	49572.55597	43372	52741	10	1.3	-0.03	0.53	7.8	3.2
T4-Corr1-01-081918	08/19/2018	39557.76632	26691	44750	41	4.9	1.18	0.46	22.2	3.6
** T7-Corr1-01-081918	08/19/2018	7655.498442	6186	9048	0.87	0.3	0.25	0.45	14.1	3.5

Notes:
* Outlier sample removed from regression analysis.
** Data validation determined this sample to be a nondetect and it was not included in the correlation analysis.
cpm counts per minute
pCi/g picocuries per gram
TPU total propagated uncertainty

Table C2-4. Gamma Count Rates and Associated Concentrations of Radium-226, Thorium-232, and Potassium-40 in Samples of Surface Soils Obtained in the Group D Correlation Study

Sample ID	Date of Collection	Gamma Count Rate (cpm)			Ra-226 (pCi/g)		Thorium-232 (pCi/g)		Potassium-40 (pCi/g)	
		Mean	Minimum	Maximum	Result	TPU	Result	TPU	Result	TPU
M3-Corr1-01-051018	05/10/2018	14201.49689	12514	16050	2.72	0.46	-0.06	0.46	11.7	3.3
M4-Corr1-01-050918	05/09/2018	35431.83168	29775	39491	12.9	1.6	0.29	0.63	12.1	3.2
M4-Corr2-01-050918	05/09/2018	13319.40323	11006	15863	2.99	0.49	0.33	0.47	16.6	4
M5-Corr1-01-050918	05/09/2018	18776.59259	15372	22184	4.52	0.63	0.12	0.42	9.1	2.4
M6-Corr1-01-051018	05/10/2018	8421.683333	7363	9342	0.38	0.14	0.27	0.17	13.1	2.2
M6-Corr2-01-050918	05/09/2018	41118.15972	35766	45938	12.7	1.6	0.2	0.56	12.9	3.3
M7-Corr1-01-051018	05/10/2018	18909.48701	16408	21471	7	0.94	1.41	0.54	23.1	4.3
M7-Corr2-01-051018	05/10/2018	12173.60989	9602	13692	2.99	0.49	0.77	0.57	11.2	3.3
M7-Corr3-01-051018	05/10/2018	37108.87681	32172	40602	12.6	1.6	0.47	0.67	12.1	3.9
M8-Corr1-01-050918	05/09/2018	26057.29008	23034	29929	6.71	0.87	1.01	0.42	24.7	4.3
* M8-Corr2-01-050918	05/09/2018	49212.62162	41453	65583	8.4	1.1	2.02	0.51	21.2	3.9
T17-Corr1-01-050918	05/09/2018	10181.80423	8509	12333	1.27	0.3	0.94	0.56	16.8	3.8

Notes:
* Outlier sample removed from regression analysis.
cpm counts per minute
pCi/g picocuries per gram
TPU total propagated uncertainty

Table C2-5. Gamma Count Rates and Associated Concentrations of Radium-226, Thorium-232, and Potassium-40 in Samples of Surface Soils Obtained in the Group F Correlation Study

Sample ID	Date of Collection	Gamma Count Rate (cpm)			Ra-226 (pCi/g)		Thorium-232 (pCi/g)		Potassium-40 (pCi/g)	
		Mean	Minimum	Maximum	Result	TPU	Result	TPU	Result	TPU
M15-Corr1-01-060418	06/04/2018	16506.52811	11267	22187	5.48	0.78	0.86	0.53	21.4	4.5
M16-Corr1-01-060418	06/04/2018	24178.74144	19549	30235	13.5	1.6	0.79	0.41	16.1	2.7
M16-Corr2-01-060418	06/04/2018	36277.704	30303	44202	18.7	2.4	0.21	0.67	16.8	3.9
M16-Corr3-01-060518	06/05/2018	56172.62548	45661	75335	29.5	3.5	-0.41	0.66	13.6	3.3
M16-Corr4-01-060518	06/05/2018	94728.81985	61686	179425	49.3	5.9	0	1	12.6	4.1
M16-Corr5-01-060518	06/05/2018	57365.87624	38736	69046	29.2	3.6	0.31	0.88	9.4	3.7
M16-Corr6-01-060518	06/05/2018	31124.8125	26560	36914	11.1	1.4	0.47	0.39	13.3	3
M17-Corr1-01-060518	06/05/2018	17422.72595	14221	21948	0.75	0.22	0.67	0.44	14.2	3.2
M18-Corr1-01-060418	06/04/2018	8984.813953	7317	11802	0.87	0.18	0.23	0.26	14.6	2.4
M19-Corr1-01-060418	06/04/2018	21798.77839	17064	27547	8.5	1.1	0.55	0.6	15	4
T23-Corr1-01-060418	06/04/2018	11916.98287	9752	14563	2.39	0.43	0.87	0.56	14.7	3.5

Notes:
cpm counts per minute
pCi/g picocuries per gram
TPU total propagated uncertainty

Table C2-6. Gamma Count Rates and Associated Concentrations of Radium-226, Thorium-232, and Potassium-40 in Samples of Surface Soils Obtained in the Group G Correlation Study

Sample ID	Date of Collection	Gamma Count Rate (cpm)			Ra-226 (pCi/g)		Thorium-232 (pCi/g)		Potassium-40 (pCi/g)	
		Mean	Minimum	Maximum	Result	TPU	Result	TPU	Result	TPU
B27-Corr1-01-061918	06/19/2018	9590.874517	7719	11675	0.63	0.21	0.76	0.42	18	3.5
M20-Corr1-01-061818	06/18/2018	22838.56176	16377	30133	7.2	0.97	0.38	0.43	11.6	3.1
M20-Corr2-01-061818	06/18/2018	11550.08263	9267	14246	1.75	0.37	0.97	0.66	18.7	4.5
M20-Corr3-01-061918	06/19/2018	33081.62064	26929	51055	19	2.3	0.86	0.57	16.2	3.4
M20-Corr4-01-061918	06/19/2018	8246.673721	6566	10061	0.42	0.17	0.56	0.42	12.1	2.9
* M21-Corr1-01-061818	06/18/2018	29931.8903	23512	40706	6.86	0.93	0.24	0.43	9.7	2.9
M21-Corr2-01-061818	06/18/2018	27281.83562	22228	33377	12.2	1.5	0.45	0.26	18.7	3
M21-Corr3-01-061818	06/18/2018	22673.3002	17845	28108	10.4	1.3	0.44	0.52	18	3.5
M21-Corr4-01-061818	06/18/2018	13866.83405	11407	16852	4.36	0.64	0.6	0.54	10.7	3.2
M22-Corr1-01-061818	06/18/2018	19042.37229	14669	24809	7.7	1	-0.05	0.46	11.4	3

Notes:
* Outlier sample removed from regression analysis.
cpm counts per minute
pCi/g picocuries per gram
TPU total propagated uncertainty

Table C2-7. Gamma Count Rates and Associated Concentrations of Radium-226, Thorium-232, and Potassium-40 in Samples of Surface Soils Obtained in the Group H Correlation Study

Sample ID	Date of Collection	Gamma Count Rate (cpm)			Ra-226 (pCi/g)		Thorium-232 (pCi/g)		Potassium-40 (pCi/g)	
		Mean	Minimum	Maximum	Result	TPU	Result	TPU	Result	TPU
M27-Corr1-01-092518	09/25/2018	31211.36458	26163	38308	13.4	1.7	0.22	0.56	14.9	3.4
M27-Corr2-01-092518	09/25/2018	22276.84156	19751	25921	4.64	0.68	-0.02	0.46	13.3	3.5
M30-Corr1-01-082118	08/21/2018	14577.94472	12375	16854	2.12	0.43	0.79	0.58	15.1	3.7
M30-Corr2-01-082118	08/21/2018	17672.13765	15605	20251	1.95	0.37	0.11	0.48	16.4	3.5
M32-Corr1-01-082118	08/21/2018	29808.87069	25732	37535	4.57	0.64	0.46	0.46	13.5	3.1
M32-Corr2-01-082118	08/21/2018	39242.9117	31947	47499	18	2.2	0.14	0.39	16.7	2.9

Notes:
cpm counts per minute
pCi/g picocuries per gram
TPU total propagated uncertainty

Table C2-8. Gamma Count Rates and Associated Concentrations of Radium-226, Thorium-232, and Potassium-40 in Samples of Surface Soils Obtained in the Group I & J Correlation Study

Sample ID	Date of Collection	Gamma Count Rate (cpm)			Ra-226 (pCi/g)		Thorium-232 (pCi/g)		Potassium-40 (pCi/g)	
		Mean	Minimum	Maximum	Result	TPU	Result	TPU	Result	TPU
B32-Corr1-01-092618	09/26/2018	8389.477778	6376	11708	0.59	0.21	0.35	0.39	7.2	2.4
M33-Corr1-01-092618	09/26/2018	8638.654611	6506	11274	0.64	0.22	0.09	0.35	8.9	2.6
M33-Corr2-01-092618	09/26/2018	21646.62313	17704	26014	9.9	1.3	0.84	0.45	20.2	3.8
M33-Corr3-01-092618	09/26/2018	13718.46174	10817	18191	4.71	0.68	0.24	0.52	11.8	3.2
M34-Corr1-01-082018	08/20/2018	31889.17959	27072	38130	23.4	2.9	1.02	0.77	16.1	4.1
M34-Corr2-01-082018	08/20/2018	23375.35426	21050	25587	9.7	1.3	0.84	0.47	10.9	3.1
M34-Corr3-01-082018	08/20/2018	42128.08306	37492	46632	20	2.4	0.57	0.43	13.6	2.6
M34-Corr4-01-082018	08/20/2018	18566.26531	16855	21156	3.32	0.51	0.49	0.42	13.2	3.1
M37-Corr1-01-082018	08/20/2018	14900.95489	12741	17581	2.43	0.36	0.52	0.21	15.9	2.7
M37-Corr2-01-082018	08/20/2018	25657.78827	22549	28341	10.9	1.5	0.56	0.59	13.6	3.6

Notes:
cpm counts per minute
pCi/g picocuries per gram
TPU total propagated uncertainty

Table C2-9. Gamma Count Rates and Associated HPIC Measurements

Sample ID	TT Group	Date of Collection	Count Rate (cpm)	Exposure Rate (µR/hr)
M19-01	F	06/04/18	22,386	22.4
M18-01	F	06/04/18	8,755	14.0
T23-01	F	06/04/18	11,769	15.6
M15-01	F	06/04/18	16,165	18.6
M16-01	F	06/04/18	22,595	21.6
M16-02	F	06/05/18	65,613	43.3
M16-03	F	06/05/18	10,3363	66.5
M16-04	F	06/05/18	53,745	38.3
M16-05	F	06/05/18	29,099	23.6
M17-01	F	06/05/18	17,143	17.4
M21-01	G	06/18/18	30,808	25.1
M21-02	G	06/18/18	77,718	47.0
M21-03	G	06/18/18	27,146	23.5
M21-04	G	06/18/18	25,073	21.8
M21-05	G	06/18/18	13,679	15.9
M22-01	G	06/18/18	19,594	19.4
M20-02	G	06/18/18	24,835	22.9
M20-03	G	06/18/18	11,437	15.0
M20-04	G	06/19/18	32,195	27.8
M20-05	G	06/19/18	58,864	40.0
M20-06	G	06/19/18	26,042	23.6
M20-07	G	06/19/18	8,218	13.7
M20-08	G	06/19/18	6,597	12.4
B27-01	G	06/19/18	9,744	15.1
T1-01	A	08/19/18	15,108	16.3
T1-02	A	08/19/18	51,787	38.3
M1-01	A	08/19/18	9,984	12.5
T4-01	A	08/19/18	40,232	30.4
B4-01	A	08/19/18	7,699	11.3
M2-01	B	08/19/18	14,307	14.9
M2-02	B	08/19/18	10,462	12.7
M2-03	B	08/19/18	7,900	11.3
T7-01	B	08/19/18	7,799	11.3

Notes:
uR/hr microroentgen per hour
cpm counts per minute
HPIC High-pressure ionization chamber
TT Tetra Tech, Inc.

ATTACHMENT C3

MULTILINEAR REGRESSION RESULTS

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GROUP I & J MULTILINEAR REGRESSION RESULTS

JML MULTILINEAR REGRESSION RESULTS

Table C3-1-1. Jml - Ra-226, K-40, and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	12043.5	4112.9	2.93	0.0078
Ra-226 Result	16434.6	95.0	17.20	< 0.0001
K-40 Result	-23.3	298.6	-0.08	0.9386
Th-232 Result	-2383.6	3210.7	-0.74	0.4657

Table C3-1-2. Jml - Ra-226 and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	11768.8	2076.1	5.67	< 0.0001
Ra-226 Result	1633.6	92.6	17.65	< 0.0001
Th-232 Result	-2519.0	2641.1	-0.95	0.3501

Table C3-1-3. Jml - Ra-226 and K-40 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	12388.1	2076.1	5.67	< 0.0001
Ra-226 Result	1665.9	92.6	17.65	< 0.0001
K-40 Result	-143.2	2641.1	-0.95	0.3501

Table C3-1-4. Jml - Ra-226 MLR Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	10168.9	1221.0	8.33	< 0.0001
Ra-226 Result	1675.7	81.4	20.58	< 0.0001

JSE & JSTE MULTILINEAR REGRESSION RESULTS

Table C3-2-1. Jse & Jste - Ra-226, K-40, and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	12043.5	4112.9	2.93	0.0078
Ra-226 Result	16434.6	95.0	17.20	< 0.0001
K-40 Result	-23.3	298.6	-0.08	0.9386
Th-232 Result	-2383.6	3210.7	-0.74	0.4657

Table C3-2-2. Jse & Jste - Ra-226 and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	11768.8	2076.1	5.67	< 0.0001
Ra-226 Result	1633.6	92.6	17.65	< 0.0001
Th-232 Result	-2519.0	2641.1	-0.95	0.3501

Table C3-2-3. Jse & Jste - Ra-226 and K-40 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	12388.1	2076.1	5.67	< 0.0001
Ra-226 Result	1665.9	92.6	17.65	< 0.0001
K-40 Result	-143.2	2641.1	-0.95	0.3501

Table C3-2-4. Jse & Jste - Ra-226 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	10168.9	1221.0	8.33	< 0.0001
Ra-226 Result	1675.7	81.4	20.58	0.3501

TSE TAH REGION MULTILINEAR REGRESSION RESULTS

Table C3-3-1. Tse Tah - Ra-226, K-40, and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	19878.0	6039.9	3.29	0.0302
Ra-226 Result	1094.1	158.8	6.89	0.0023
K-40 Result	-877.8	511.7	-1.72	0.1614
Th-232 Result	-5034.0	3178.3	-1.58	0.1884

Table C3-3-2. Tse Tah - Ra-226 and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	9750.1	1532.2	6.36	< 0.0014
Ra-226 Result	856.8	91.8	9.33	< 0.0002
Th-232 Result	-4700.9	3738.1	-1.26	0.2641

Table C3-3-3 Tse Tah - Ra-226 and K-40 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	17563.7	6688.3	2.63	< 0.0468
Ra-226 Result	982.9	162.5	6.05	< 0.0018
K-40 Result	-828.3	582.7	-1.42	0.2145

Table C3-3-4. Tse Tah - Ra-226 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	8125.3	862.7	9.42	< 0.001
Ra-226 Result	765.2	58.5	13.09	< 0.001

GROUP D MULTILINEAR REGRESSION RESULTS

Table C3-4-1. Group D - Ra-226, K-40, and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	5040.5	2939.1	1.71	0.1301
Ra-226 Result	2411.1	160.2	15.05	< 0.0001
K-40 Result	286.6	244.3	1.17	0.2791
Th-232 Result	-4797.6	2717.6	-1.77	0.1208

Table C3-4-2. Group D - Ra-226 and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	7989.1	1559.2	5.12	0.0009
Ra-226 Result	2410.8	163.9	14.72	< 0.0001
Th-232 Result	-2291.0	1718.6	-1.33	0.2192

Table C3-4-3. Group D - Ra-226 and K-40 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	7516.0	2904.7	2.59	0.0322
Ra-226 Result	2419.8	180.0	13.44	< 0.0001
K-40 Result	-52.4	169.8	-0.31	0.7653

Table C3-4-4. Group D - Ra-226 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	6723.2	1288.9	5.22	0.0006
Ra-226 Result	2422.1	170.6	14.2	< 0.0001

GROUP F MULTILINEAR REGRESSION RESULTS

Table C3-5-1. Group F - Ra-226, K-40, and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	17397.5	8824.8	1.97	0.0893
Ra-226 Result	1638.5	127.5	12.85	< 0.001
K-40 Result	-590.3	537.7	-1.10	0.3086
Th-232 Result	698.8	4844.4	0.41	0.8894

Table C3-5-2. Group F - Ra-226 and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	8643.4	3826.9	2.26	< 0.0538
Ra-226 Result	1672.6	125.2	13.36	< 0.001
Th-232 Result	-385.7	4802.9	-0.08	0.9380

Table C3-5-3. Group F - Ra-226 and K-40 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	17623.1	8136.3	2.17	< 0.0622
Ra-226 Result	1627.5	95.8	16.99	< 0.0001
K-40 Result	-574.5	493.2	-1.16	0.2776

Table C3-5-4. Group F - Ra-226 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	8378.4	1827.7	4.58	0.0013
Ra-226 Result	1679.5	86.4	19.43	0.001

GROUP G MULTILINEAR REGRESSION RESULTS

Table C3-6-1. Group G - Ra-226, K-40, and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	9063.9	3377.6	2.68	0.0436
Ra-226 Result	1336.8	129.9	10.29	0.0001
K-40 Result	89.8	264.2	0.34	0.5093
Th-232 Result	-2146.0	3021.7	-0.71	0.7477

Table C3-6-2. Group G - Ra-226 and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	10020.5	1724.9	5.81	0.0011
Ra-226 Result	1349.0	115.3	11.70	< 0.0001
Th-232 Result	-1588.1	2342.9	-0.68	0.5231

Table C3-6-3. Group G - Ra-226 and K-40 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	9265.0	3223.7	2.87	0.0283
Ra-226 Result	1357.6	121.3	11.19	< 0.0001
K-40 Result	-12.1	212.5	-0.06	0.9565

Table C3-6-4. Group G - Ra-226 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	9092.5	1007.9	9.02	< 0.0001
Ra-226 Result	1356.3	110.3	12.3	< 0.0001

GROUP H MULTILINEAR REGRESSION RESULTS

Table C3-7-1. Group H - Ra-226, K-40, and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	38697.7	28185.3	1.37	0.3034
Ra-226 Result	1353.8	436.4	3.10	0.0901
K-40 Result	-1508.5	1941.2	-0.78	0.5184
Th-232 Result	-1338.2	9121.0	-0.15	0.8968

Table C3-7-2. Group H - Ra-226 and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	17160.6	4770.7	3.6	0.0368
Ra-226 Result	1224.5	375.8	3.26	0.0472
Th-232 Result	-1697.6	8486.5	-0.20	0.8542

Table C3-7-3. Group H - Ra-226 and K-40 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	38378.0	23067.5	1.66	0.1948
Ra-226 Result	1374.9	338.3	4.06	0.0269
K-40 Result	-1522.9	1591.5	-0.96	0.4092

Table C3-7-4. Group H - Ra-226 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	16491.7	2966.5	5.56	0.0051
Ra-226 Result	1249.8	308.6	4.05	0.0155

GROUP I & J MULTILINEAR REGRESSION RESULTS

Table C3-8-1. Group I & J - Ra-226, K-40, and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	9341.1	5967.5	1.57	0.1685
Ra-226 Result	1301.7	297.0	4.38	0.0047
K-40 Result	232.9	565.8	0.41	0.6949
Th-232 Result	-4803.1	9490.0	-0.51	0.6308

Table C3-8-2. Group I & J - Ra-226 and Th-232 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	11315.3	3333.8	3.39	0.0115
Ra-226 Result	1301.9	278.9	4.67	0.0023
Th-232 Result	-2839.3	7701.5	-0.37	0.7233

Table C3-8-3. Group I & J - Ra-226 and K-40 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	9387.9	5640.8	1.66	0.1400
Ra-226 Result	1207.5	218.8	5.52	0.0009
K-40 Result	88.9	462.4	0.19	0.8529

Table C3-8-4. Group I & J - Ra-226 Multilinear Regression Results

Term	Estimate	Std Error	t Ratio	Prob > |t|
Intercept	10386.9	2063.4	5.03	0.0010
Ra-226 Result	1227.3	181.1	6.78	0.0001

ATTACHMENT C4

OUTLIER ANALYSIS RESULTS

Analysis of the correlation data sets was conducted to determine if statistically significant outliers existed. The two methods, as described in ASTM's "Standard Practice for Dealing With Outlying Observations" E178-08 published November 2008 tested the T-statistic and the Dixon criteria. A sample was considered an outlier if both tests concluded the sample was significantly different than the population at the 5% significance level. Calculation of the T-statistic (T_n) is described by an excerpt from ASTM E178-08 below:

6.1 Let the sample of n observations be denoted in order of increasing magnitude by $x_1 \leq x_2 \leq x_3 \leq \ldots \leq x_n$. Let x_n be the doubtful value, that is the largest value. The test criterion, T_n, recommended here for a single outlier is as follows:

$$T_n = (x_n - \bar{x})/s \quad (1)$$

where:

$\bar{x}$ = arithmetic average of all n values, and

s = estimate of the population standard deviation based on the sample data, calculated as follows:

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{\sum_{i=1}^{n} x_i^2 - n \cdot \bar{x}^2}{n-1}} = \sqrt{\frac{\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2/n}{n-1}}$$

The T-statistic is then compared to the critical values given in Table 1 of ASTM's "Standard Practice for Dealing With Outlying Observations" E178-08 published November 2008. A result that is larger than the critical value indicates that sample is statistically different than the population for a given significance level.

TABLE 1 Critical Values for *T* (One-Sided Test) When Standard Deviation Is Calculated from the Same Sample[A]

Number of Observations, *n*	Upper 0.1 % Significance Level	Upper 0.5 % Significance Level	Upper 1 % Significance Level	Upper 2.5 % Significance Level	Upper 5 % Significance Level	Upper 10 % Significance Level
3	1.155	1.155	1.155	1.155	1.153	1.148
4	1.499	1.496	1.492	1.481	1.463	1.425
5	1.780	1.764	1.749	1.715	1.672	1.602
6	2.011	1.973	1.944	1.887	1.822	1.729
7	2.201	2.139	2.097	2.020	1.938	1.828
8	2.358	2.274	2.221	2.126	2.032	1.909
9	2.492	2.387	2.323	2.215	2.110	1.977
10	2.606	2.482	2.410	2.290	2.176	2.036
11	2.705	2.564	2.485	2.355	2.234	2.088
12	2.791	2.636	2.550	2.412	2.285	2.134
13	2.867	2.699	2.607	2.462	2.331	2.175
14	2.935	2.755	2.659	2.507	2.371	2.213
15	2.997	2.806	2.705	2.549	2.409	2.247
16	3.052	2.852	2.747	2.585	2.443	2.279
17	3.103	2.894	2.785	2.620	2.475	2.309
18	3.149	2.932	2.821	2.651	2.504	2.335
19	3.191	2.968	2.854	2.681	2.532	2.361
20	3.230	3.001	2.884	2.709	2.557	2.385
21	3.266	3.031	2.912	2.733	2.580	2.408
22	3.300	3.060	2.939	2.758	2.603	2.429
23	3.332	3.087	2.963	2.781	2.624	2.448
24	3.362	3.112	2.987	2.802	2.644	2.467
25	3.389	3.135	3.009	2.822	2.663	2.486
26	3.415	3.157	3.029	2.841	2.681	2.502
27	3.440	3.178	3.049	2.859	2.698	2.519
28	3.464	3.199	3.068	2.876	2.714	2.534
29	3.486	3.218	3.085	2.893	2.730	2.549
30	3.507	3.236	3.103	2.908	2.745	2.563

The Dixon criteria calculation and critical values are given in Table 2 (shown below for reference) from ASTM's "Standard Practice for Dealing With Outlying Observations" E178-08 published November 2008. The Dixon criteria is calculated differently depending on the number of samples, n, in the population and whether the suspected sample is the smallest or the largest value in the data set.

TABLE 2 Dixon Criteria for Testing of Extreme Observation (Single Sample)[A]

n	Criterion	Significance Level (One-Sided Test)		
		10 percent	5 percent	1 percent
3	$r_{10} = (x_2 - x_1)/(x_n - x_1)$ if smallest value is suspected;	0.886	0.941	0.988
4	$= (x_n - x_{n-1})/(x_n - x_1)$ if largest value is suspected	0.679	0.765	0.889
5		0.557	0.642	0.780
6		0.482	0.560	0.698
7		0.434	0.507	0.637
8	$r_{11} = (x_2 - x_1)/(x_{n-1} - x_1)$ if smallest value is suspected;	0.479	0.554	0.683
9	$= (x_n - x_{n-1})/(x_n - x_2)$ if largest value is suspected.	0.441	0.512	0.635
10		0.409	0.477	0.597
11	$r_{21} = (x_3 - x_1)/(x_{n-1} - x_1)$ if smallest value is suspected;	0.517	0.576	0.679
12	$= (x_n - x_{n-2})/(x_n - x_2)$ if largest value is suspected.	0.490	0.546	0.642
13		0.467	0.521	0.615
14	$r_{22} = (x_3 - x_1)/(x_{n-2} - x_1)$ if smallest value is suspected;	0.492	0.546	0.641
15	$= (x_n - x_{n-2})/(x_n - x_3)$ if largest value is suspected.	0.472	0.525	0.616
16		0.454	0.507	0.595
17		0.438	0.490	0.577
18		0.424	0.475	0.561
19		0.412	0.462	0.547
20		0.401	0.450	0.535
21		0.391	0.440	0.524
22		0.382	0.430	0.514
23		0.374	0.421	0.505
24		0.367	0.413	0.497
25		0.360	0.406	0.489
26		0.354	0.399	0.486
27		0.348	0.393	0.475
28		0.342	0.387	0.469
29		0.337	0.381	0.463
30		0.332	0.376	0.457

[A] $x_1 \le x_2 \le \ldots \le x_n$. (See Ref **(1)**, Appendix.)

The following tables present the data sets used in calculation of the T-statistic and the Dixon criteria for each correlation where outlier tests were performed. Following each data set table are the parameters and results for each test, respectively.

The tables are in the groupings and order as listed below.

JML GEOLOGY

Table C4-1-1. Jml Geology - Correlation Dataset Residuals

Table C4-1-2. Jml Geology - T-Statistic Test Parameters and Results

Table C4-1-3. Jml Geology - Dixon Criterion Test Parameters and Results

TSE TAH REGION

Table C4-2-1. Tse Tah Region - Correlation Dataset Residuals

Table C4-2-2. Tse Tah Region - T-Statistic Test Parameters and Results

Table C4-2-3. Tse Tah Region - Dixon Criterion Test Parameters and Results

JSE & JSTE GEOLOGY

Table C4-3-1. Jse & Jste Geology - Correlation Dataset Residuals

Table C4-3-1. Jse & Jste Geology - T-Statistic Test Parameters and Results

Table C4-3-2. Jse & Jste Geology - Dixon Criterion Test Parameters and Results

GROUP D

Table C4-4-1. Group D – Correlation Dataset Residuals

Table C4-4-2. Group D – T-Statistic Test Parameters and Results

Table C4-4-3. Group D – Dixon Criterion Test Parameters and Results

GROUP G

Table C4-5-1. Group G – Correlation Dataset Residuals

Table C4-5-2. Group G – T-Statistic Test Parameters and Results

Table C4-5-3. Group G – Dixon Criterion Test Parameters and Results

GROUP F

GROUP H

GROUP I & J

Table C4-1-1. Jml Geology - Correlation Dataset Residuals

Graphical analysis suggests an outlier at M8-CORR2. Statistical analysis supports the conclusion that M8-CORR2 is an outlier.

Sample ID	Average Gamma (cpm)	Predicted Gamma (cpm)	Residuals
M20-Corr4-01-061918	8246.7	11904.5	-3657.8
B27-Corr1-01-061918	9590.9	12254.0	-2663.1
M18-Corr1-01-060418	8984.8	12653.5	-3668.7
T17-Corr1-01-050918	10181.8	13319.2	-3137.4
M30-Corr2-01-082118	17672.1	14451.0	3221.1
M30-Corr1-01-082118	14577.9	14733.9	-156.0
T23-Corr1-01-060418	11917.0	15183.3	-3266.3
M3-Corr1-01-051018	14201.5	15732.6	-1531.1
M4-Corr2-01-050918	13319.4	16182.0	-2862.6
M7-Corr2-01-051018	12173.6	16182.0	-4008.4
M21-Corr4-01-061818	13866.8	18462.2	-4595.3
M5-Corr1-01-050918	18776.6	18728.5	48.1
M32-Corr1-01-082118	29808.9	18811.7	10997.2
M15-Corr1-01-060418	16506.5	20326.3	-3819.7
M8-Corr1-01-050918	26057.3	22373.5	3683.8
M7-Corr1-01-051018	18909.5	22856.1	-3946.6
M8-Corr2-01-050918	49212.6	25186.3	24026.4
M16-Corr6-01-060518	31124.8	29680.1	1444.7
M7-Corr3-01-051018	37108.9	32176.7	4932.2
M6-Corr2-01-050918	41118.2	32343.1	8775.0
M4-Corr1-01-050918	35431.8	32676.0	2755.8
M16-Corr1-01-060418	24178.7	33674.6	-9495.9
M32-Corr2-01-082118	39242.9	41164.3	-1921.4
M16-Corr2-01-060418	36277.7	42329.4	-6051.7
M16-Corr5-01-060518	57365.9	59805.4	-2439.5
M16-Corr3-01-060518	56172.6	60304.7	-4132.1
M16-Corr4-01-060518	94728.8	93259.5	1469.3

Notes:
Colored shading indicates suspected outlier (green for statistically significant and orange for not statistically significant).
cpm Counts per minute

Table C4-1-2. Jml Geology - T-Statistic Test Parameters and Results

n	X_{avg}	s	T_n	Critical Value
27	-1.4E-8	6556.8	3.66	2.698

Notes:
n Number of observations
s Estimate of the population standard deviation
T_n Test criterion
X_{avg} Average of the residuals

Table C4-1-3. Jml Geology - Dixon Criterion Test Parameters and Results

n	Dixon Criterion	X_n	X_{n-2}	X_3	Result	Critical Value
27	r22	24026	8775	-4595	0.533	0.393

Notes:
n Number of observations
X_3 Value at index 3
X_n Doubtful value
X_{n-2} Value at index n-2

Table C4-2-1. Tse Tah Region - Correlation Dataset Residuals

Graphical analysis suggests an outlier at T1-CORR2. Statistical analysis supports the conclusion that T1-CORR2 is an outlier.

Sample ID	Average Gamma (cpm)	Predicted Gamma (cpm)	Residuals
B4-Corr1-01-081918	7930.1	11867.8	-3937.7
M1-Corr1-01-081918	10125.7	12647.1	-2521.4
M2-Corr1-01-081918	11545.6	16460.6	-4915.0
M2-Corr2-01-081918	9548.8	14487.5	-4938.8
M2-Corr3-01-081918	7832.9	12166.3	-4333.4
T1-Corr1-01-081918	14565.4	13492.7	1072.7
T1-Corr2-01-081918	49572.6	19693.8	29878.7
T4-Corr1-01-081918	39557.8	45393.7	-5836.0
T7-Corr1-01-081918	7655.5	12124.8	-4469.3

Notes:
Colored shading indicates suspected outlier (green for statistically significant and orange for not statistically significant).
cpm Counts per minute

Table C4-2-2. Tse Tah Region - T-Statistic Test Parameters and Results

n	X_{avg}	S	T_n	Critical Value
9	6.67E-8	11385.9	2.62	2.11

Notes:
n Number of observations
s Estimate of the population standard deviation
T_n Test criterion
X_{avg} Average of the residuals

Table C4-2-3. Tse Tah Region - Dixon Criterion Test Parameters and Results

n	Dixon Criterion	X_n	X_{n-1}	X_2	Result	Critical Value
9	r11	29879	1073	-4939	0.827	0.512

Notes:
n Number of observations
X_2 Value at index 2
X_n Doubtful value
X_{n-1} Value at index n-1

Table C4-3-1. Jse & Jste Geology - Correlation Dataset Residuals

Graphical analysis suggests an outlier at M21-CORR1, however statistical analysis does not support that conclusion.

Sample ID	Average Gamma (cpm)	Predicted Gamma (cpm)	Residuals
M21-Corr1-01-061818	29931.9	20428.5	9503
M34-Corr1-01-082018	31889.2	39450.2	-7561
M34-Corr3-01-082018	42128.1	35540.1	6588
B32-Corr1-01-092618	8389.5	13217.8	-4828
M33-Corr1-01-092618	8638.7	13275.3	-4637
M27-Corr2-01-092518	22276.8	17875.4	4401
M33-Corr3-01-092618	13718.5	17955.9	-4237
M17-Corr1-01-060518	17422.7	13401.8	4021
M27-Corr1-01-092518	31211.4	27949.8	3262
M20-Corr2-01-061818	11550.1	14551.8	-3002
M22-Corr1-01-061818	19042.4	21394.6	-2352
M33-Corr2-01-092618	21646.6	23924.7	-2278
M34-Corr4-01-082018	18566.3	16357.4	2209
M20-Corr1-01-061818	22838.6	20819.6	2019
M21-Corr3-01-061818	22673.3	24499.7	-1826
M20-Corr3-01-061918	33081.6	34390.0	-1308
M21-Corr2-01-061818	27281.8	26569.8	712
M37-Corr2-01-082018	25657.8	25074.7	583
M19-Corr1-01-060418	21798.8	22314.6	-516
M37-Corr1-01-082018	14901.0	15333.9	-433

Notes:
Colored shading indicates suspected outlier (green for statistically significant and orange for not statistically significant).
cpm Counts per minute

Table C4-3-2. Jse & Jste Geology - T-Statistic Test Parameters and Results

n	X_{avg}	s	T_n	Critical Value
21	9.05E-9	4092.5	2.32	2.58

Notes:
N Number of observations
S Estimate of the population standard deviation
T_n Test criterion
X_{avg} Average of the residuals

Table C4-3-3. Jse & Jste Geology - Dixon Criterion Test Parameters and Results

n	Dixon Criterion	X_n	X_{n-2}	X_3	Result	Critical Value
21	r22	9503	4401	-4637	0.361	0.440

Notes:
N Number of observations
X_3 Value at index 3
X_n Doubtful value
X_{n-2} Value at index n-2

Table C4-4-1. Group D – Correlation Dataset Residuals

Graphical analysis suggests an outlier at M8-CORR2. Statistical analysis supports the conclusion that M8-CORR2 is an outlier.

Sample ID	Average Gamma (cpm)	Predicted Gamma (cpm)	Residuals
M3-Corr1-01-051018	14201.5	14419.9	-218.4
M4-Corr1-01-050918	35431.8	41191.9	-5760.1
M4-Corr2-01-050918	13319.4	15129.9	-1810.5
M5-Corr1-01-050918	18776.6	19153.6	-377.0
M6-Corr1-01-051018	8421.7	8266.0	155.7
M6-Corr2-01-050918	41118.2	40665.9	452.2
M7-Corr1-01-051018	18909.5	25675.7	-6766.2
M7-Corr2-01-051018	12173.6	15129.9	-2956.3
M7-Corr3-01-051018	37108.9	40402.9	-3294.1
M8-Corr1-01-050918	26057.3	24913.0	1144.3
M8-Corr2-01-050918	49212.6	29357.5	19855.1
T17-Corr1-01-050918	10181.8	10606.6	-424.8

Notes:
Colored shading indicates suspected outlier (green for statistically significant and orange for not statistically significant).
cpm Counts per minute

Table C4-4-2. Group D – T-Statistic Test Parameters and Results

n	X_{avg}	s	T_n	Critical Value
12	-7.17E-8	6728.2	2.95	2.285

Notes:
N Number of observations
S Estimate of the population standard deviation
T_n Test criterion
X_{avg} Average of the residuals

Table C4-4-3. Group D – Dixon Criterion Test Parameters and Results

n	Dixon Criterion	X_n	X_{n-2}	X_2	Result	Critical Value
12	r21	19855	452	-5760	0.757	0.546

Notes:
N Number of observations
X_2 Value at index 2
X_n Doubtful value
X_{n-2} Value at index n-2

Table C4-5-1. Group G – Correlation Dataset Residuals

Graphical analysis suggests an outlier at M21-CORR1. Statistical analysis supports the conclusion that M21-CORR1 is an outlier.

Sample ID	Average Gamma (cpm)	Predicted Gamma (cpm)	Residuals
B27-Corr1-01-061918	9590.9	11147.7	-1556.8
M20-Corr1-01-061818	22838.6	20010.0	2828.5
M20-Corr2-01-061818	11550.1	12658.4	-1108.4
M20-Corr3-01-061918	33081.6	35927.3	-2845.7
M20-Corr4-01-061918	8246.7	10864.4	-2617.7
M21-Corr1-01-061818	29931.9	19551.4	10380.5
M21-Corr2-01-061818	27281.8	26754.6	527.2
M21-Corr3-01-061818	22673.3	24326.6	-1653.3
M21-Corr4-01-061818	13866.8	16179.1	-2312.3
M22-Corr1-01-061818	19042.4	20684.5	-1642.1

Notes:
Colored shading indicates suspected outlier (green for statistically significant and orange for not statistically significant).
cpm Counts per minute

Table C4-5-2. Group G – T-Statistic Test Parameters and Results

n	X_{avg}	s	T_n	Critical Value
10	4.20E-8	4020	2.58	2.176

Notes:
N Number of observations
S Estimate of the population standard deviation
T_n Test criterion
X_{avg} Average of the residuals

Table C4-5-3. Group G – Dixon Criterion Test Parameters and Results

n	Dixon Criterion	X_n	X_{n-1}	X_1	Result	Critical Value
10	r11	10381	2829	-2846	0.571	0.477

Notes:
N Number of observations
X_1 Value at index 2
X_n Doubtful value
X_{n-1} Value at index n-2

GROUP F

The Group F correlation has no clear visual outliers and the correlation passes the data quality objectives, so no statistical analysis was completed.

GROUP H

The Group H correlation has no clear visual outliers and the correlation passes the data quality objectives, so no statistical analysis was completed.

GROUP I & J

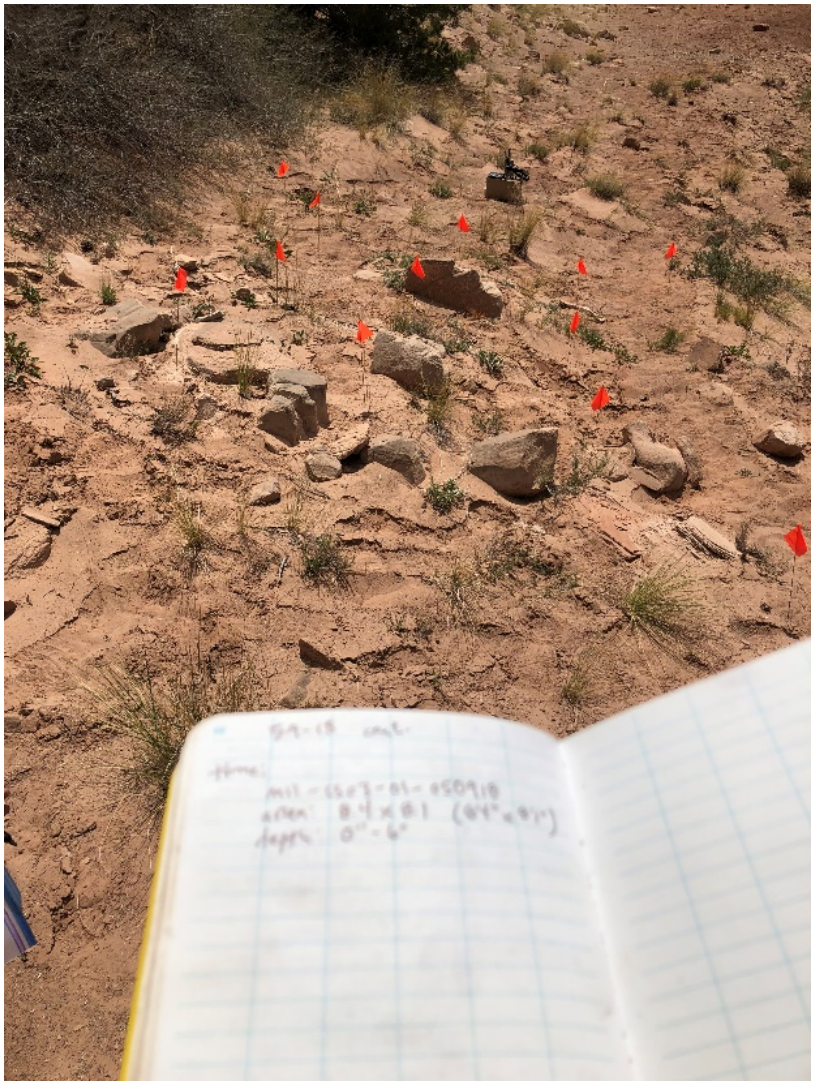
The Group I & J correlation has no clear visual outliers and the correlation passes the data quality objectives, so no statistical analysis was completed.

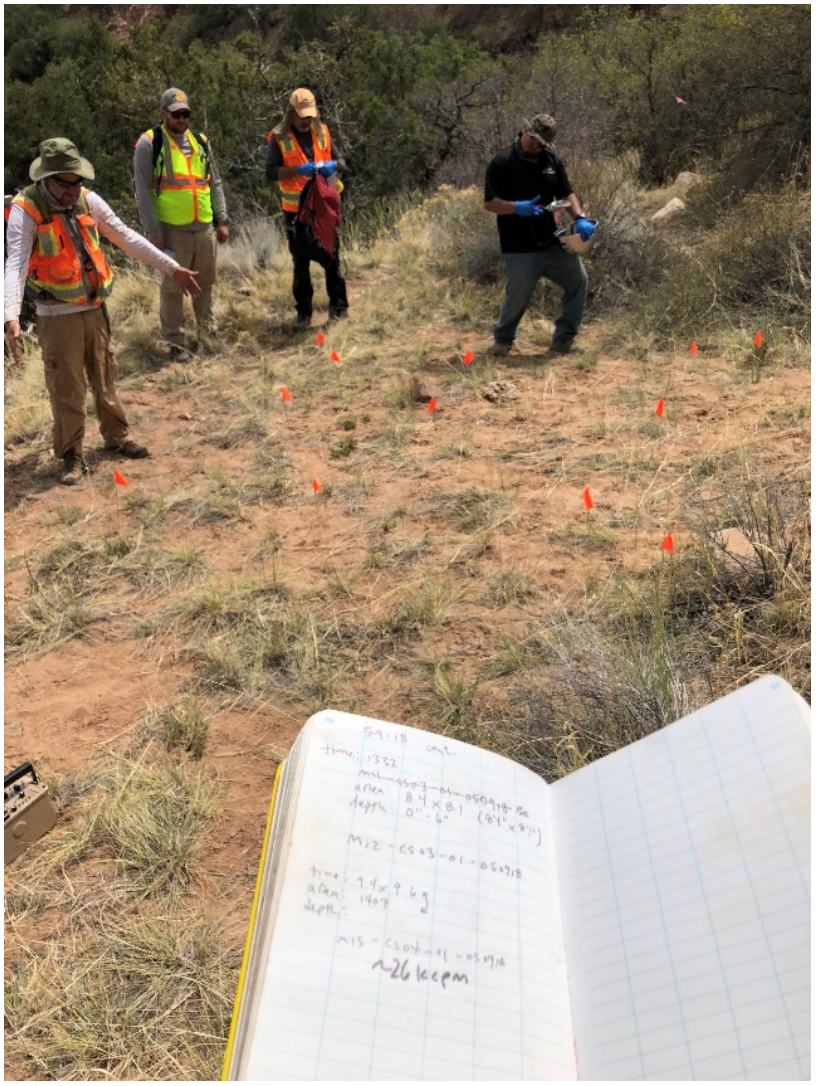
ATTACHMENT C5

IMAGES OF CORRELATION PLOTS AND HPIC LOCATIONS

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M4-CORR1-01-050918	NOT APPLICABLE

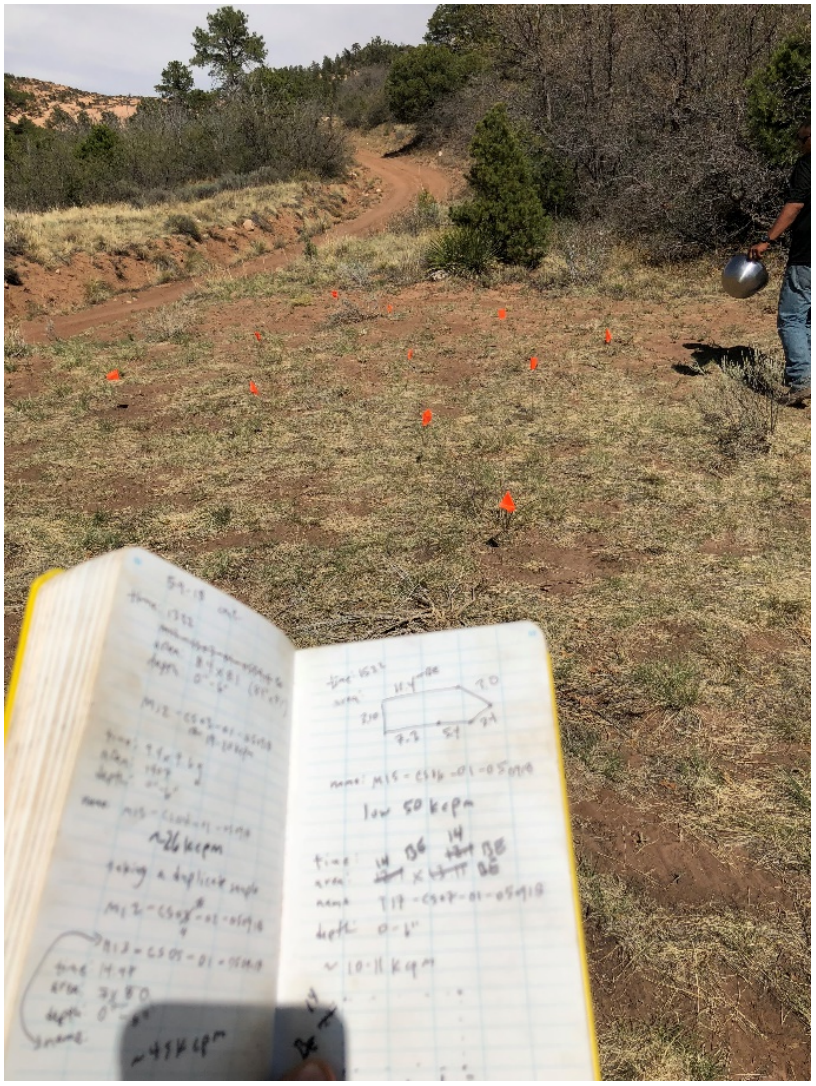
CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M4-CORR2-01-050918	NOT APPLICABLE

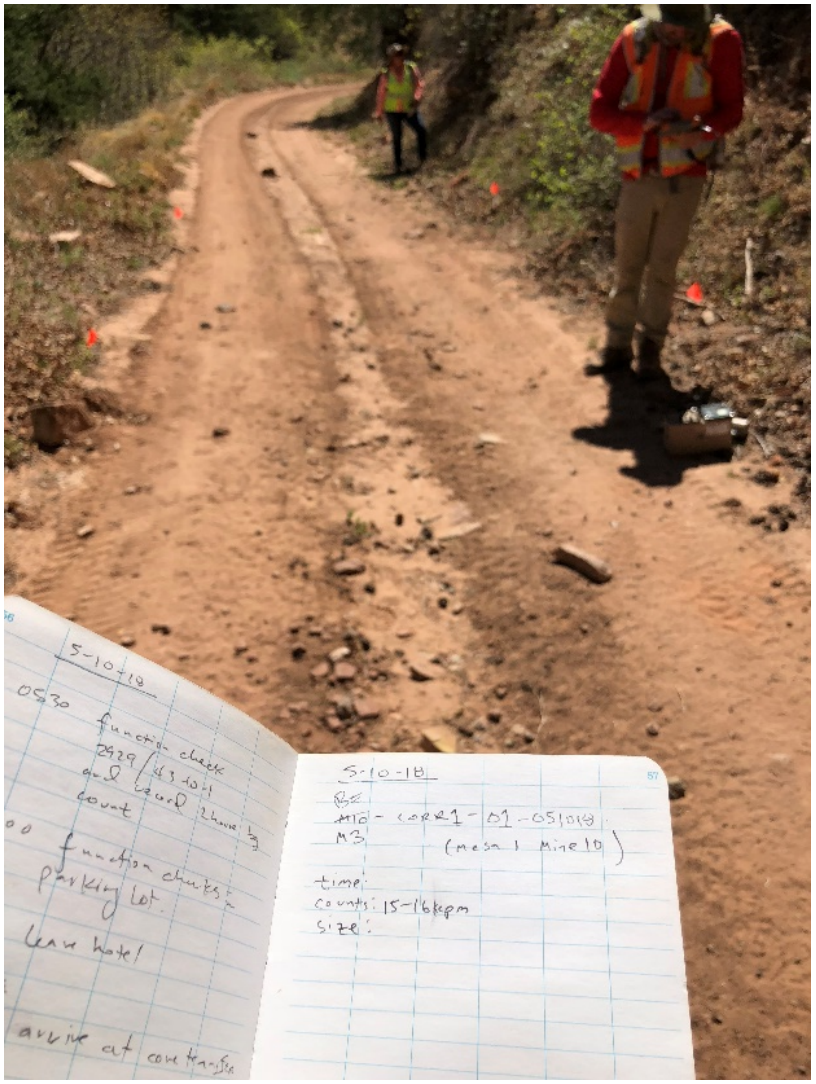
CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M5-CORR1-01-050918	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M8-CORR1-01-050918	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M6-CORR2-01-050918	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M8-CORR2-01-050918	NOT APPLICABLE

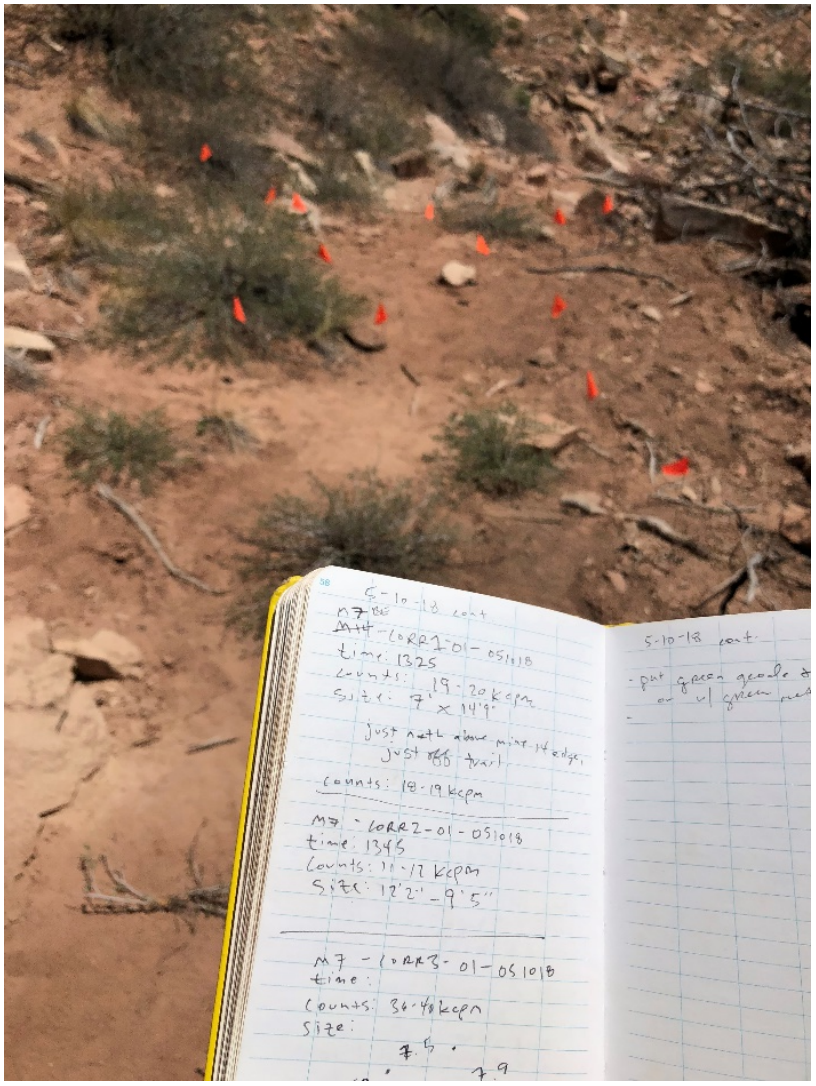
CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	T17-CORR1-01-050918	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M3-CORR1-01-051018	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M6-CORR1-01-051018	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M7-CORR1-01-051018	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M7-CORR2-01-051018	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M7-CORR1-01-051018	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M19-CORR1-01-060418	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M18-CORR1-01-060418	M18-01

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	T23-CORR1-01-060418	T23-01

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M15-CORR1-01-060418	M15-01

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M16-CORR1-01-060418	M16-01

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M16-CORR2-01-060418	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M16-CORR3-01-060418	M16-02

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M16-CORR4-01-060418	M16-03

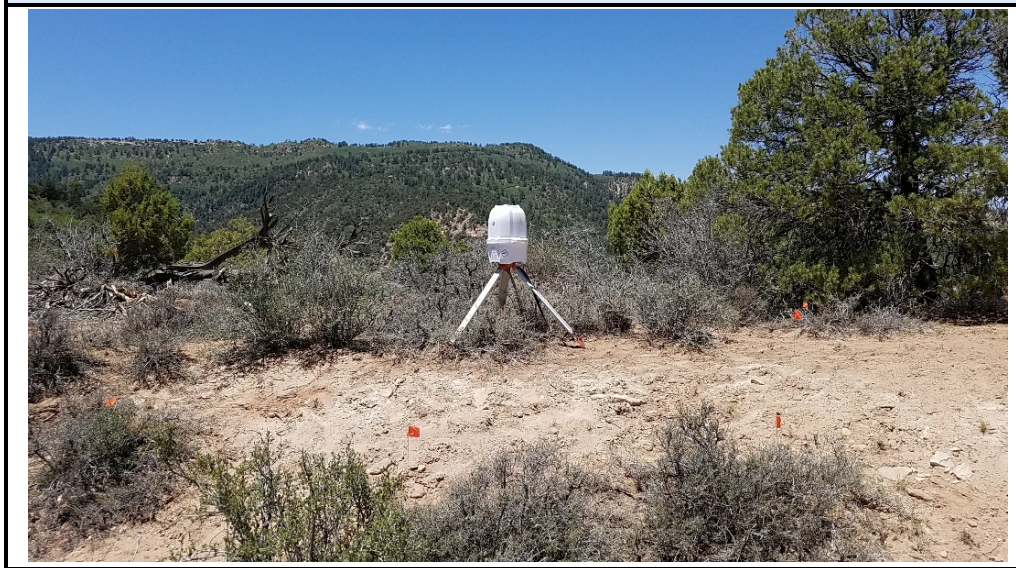
CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M16-CORR5-01-060418	M16-04

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M16-CORR6-01-060418	M16-05

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M17-CORR1-01-060418	M17-01

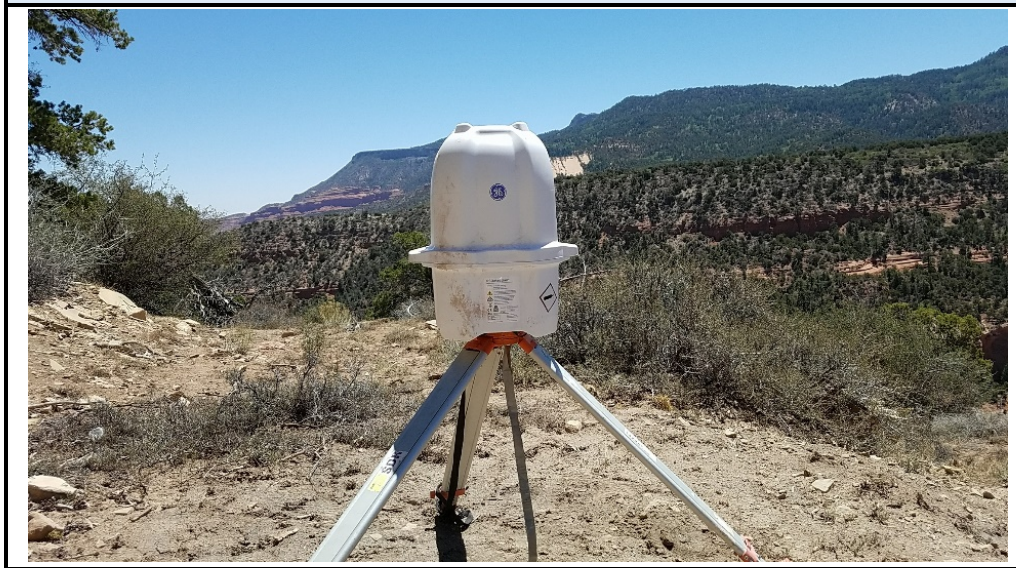
CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M21-CORR1-01-061818	M21-01
	NO SOIL SAMPLE TAKEN	M21-02

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M21-CORR2-01-061818	M21-03
	M21-CORR3-01-061818	M21-04

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M21-CORR4-01-061818	M21-05
	M22-CORR1-01-061818	M22-01

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M20-CORR1-01-061818	M20-02
	M20-CORR2-01-061818	M20-03

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M20-CORR3-01-061818	M20-04
	NO SOIL SAMPLE TAKEN	M20-05

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	NO SOIL SAMPLE TAKEN	M20-06
	M20-CORR4-061918	M20-07

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	NO SOIL SAMPLE TAKEN	M20-08
	B27-CORR1-01-061918	B27-01

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	T1-CORR1-01-081918	T1-01
	T1-CORR2-01-081918	T1-02

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M1-CORR1-01-081918	M1-01
	T4-CORR1-01-081918	T4-01

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	B4-CORR1-01-081918	B4-01
	M2-CORR1-01-081918	M2-01

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M2-CORR2-01-081918	M2-02
	T7-CORR1-01-081918	T7-01

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M37-CORR1-01-082018	NOT APPLICABLE
	M37-CORR2-01-082018	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M34-CORR1-01-082018	NOT APPLICABLE
	M34-CORR2-01-082018	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M34-CORR3-01-082018	NOT APPLICABLE
	M34-CORR4-01-082018	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M32-CORR1-01-082118	NOT APPLICABLE
	M32-CORR2-01-082118	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M30-CORR1-01-082118	NOT APPLICABLE
	M30-CORR2-01-082118	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	M27-CORR1-01-092518	NOT APPLICABLE
	M27-CORR2-01-092518	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	T9-CORR1-01-092518	NOT APPLICABLE
	T10-CORR1-01-092518	NOT APPLICABLE

CORRELATION PLOT PHOTO	SOIL SAMPLE ID	HPIC ID
	T11-CORR1-01-092518	NOT APPLICABLE