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June 12, 2017

Sylvia P. Tella
Milwhite, Inc
5487 South Padre Island Highway
Brownsville TX 78521
800-442-0082
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Subject: X-ray Diffraction Analysis
Sample: Zeolita Natural
K-T File No.: Z17160B

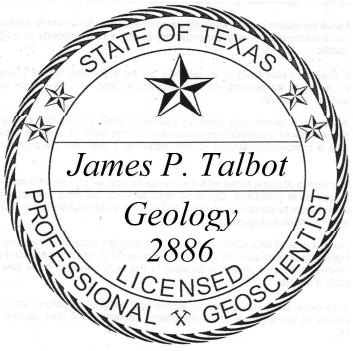
Dear Ms. Tella,

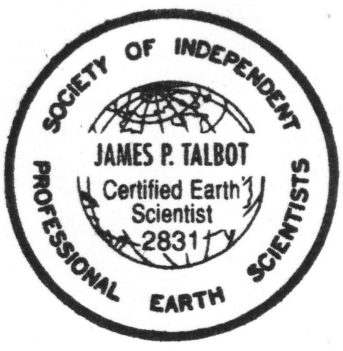
This report presents the results of bulk (whole rock) and clay fraction (<4 micron) X-ray diffraction (XRD) analysis performed on 1 sample. This analysis is performed to provide mineralogy of the sample.

Enclosed find the tabular XRD data (weight percentage), the X-ray diffraction traces and a detailed description of sample preparation and analytical procedures. For your convenience, I have sent a copy of this report via e-mail.

Unused portions of the samples will be returned upon request. If you have any questions concerning these results or if you need anything else please contact me at (970) 641-1235. Thank you for using K-T GeoServices to perform your X-ray diffraction analyses and I look forward to working with you again in the future.

Sincerely,





James P. Talbot, P.G.

X-ray Diffraction Data
(Weight Percent)

Sample ID	Zeolita Natural
XRD#	MW141
Quartz	1.3
Heu/Cli*	87.3
K-Feldspar	0
Plagioclase	0
Hematite	0
Gypsum	0
Calcite	0
Illite&Mica	0
Smectite	11.4
TOTAL	100

*Heu/Cli - Heulandite and/or Clinoptilolite. These two minerals are indistinguishable using XRD methods.

See page 3 for mineral definitions.
See page 4 for a discussion of X-ray diffraction terminology and limitations.
Sample preparation and analytical procedures are on page 5.
X-ray diffraction traces are on pages 6 – 7.

Mineral Definitions
Phyllosilicate (Clay) Minerals

Illite & Mica
Illite & Mica (muscovite) are common non-expanding (non-swelling) minerals. Illite is the fine-grained clay mineral analogue to muscovite. Illite and Mica are hydrated silicates containing potassium, silica and alumina.

Smectite (Montmorillonite)
A clay mineral group synonymous with the montmorillonite group. The smectite group is composed of expandable (swelling) clay minerals. The general formula for Smectite is $(Na,Ca)(Al,Mg)_6 (Si_4O_{10})_3(OH)_6 \bullet n H_2O$. Smectites are characterized by swelling in water and extreme colloidal behavior.

Rock Forming (nonclay) Minerals

Quartz
Quartz (SiO_2) is the most common rock-forming mineral.

Barite
Barite is an anhydrous barium sulfate mineral that has the formula $BaSO_4$.

K-Feldspar
K-Feldspar ($KAlSi_3O_8$) is a potassium bearing feldspar and can be Orthoclase, Microcline or Sanidine.

Plagioclase
Plagioclase is a mineral series ranging in composition from Albite ($NaAlSi_3O_8$) to Anorthite ($CaAl_2Si_2O_8$) and is one of the most common rock forming mineral groups.

Calcite
Calcite is a common hexagonal carbonate mineral with the formula $CaCO_3$.

Clinoptilolite
Clinoptilolite is a member of the zeolite group of minerals. It is a hydrated sodium potassium calcium aluminum silicate that has the formula $(Na, K, Ca)_{2-3} Al_3(Al, Si)_2Si_{13}O_{36} \bullet 12H_2O$,

Heulandite
Heulandite is one of the most common members of the zeolite group of minerals. It is a hydrated calcium sodium aluminum silicate with the formula $(Ca, Na)_{2-3} Al_3 (Al, Si)_2 Si_{13}O_{36} \bullet 12H_2O$.

Reference for general mineral definitions: Dictionary of Geological Terms, American Geological Institute, 1976, Anchor Press/Doubleday, Garden City, New York.

K-T GeoServices, Inc.
Whole Rock and Clay Fraction XRD
Discussion of Terminology and Limitations

Weight percentage data from X-ray diffraction methods are considered semi-quantitative. There are many factors affecting the results.

XRD methods can quantify crystalline material only. Organic non-crystalline material in large concentrations can be detected but not quantified. Therefore, any organic and/or non-crystalline material is not included in the accompanying results.

Detection limits for XRD are on the order of one to five weight percent. The detection limits differ for each mineral species.

Mineral standards used to determine calibration factors are often different from the actual minerals analyzed. Minerals such as feldspars that undergo solid solution are especially problematic. Clay minerals are problematic for this same reason. Clay minerals also have a wide range of crystallinities (poorly crystallized to well crystallized) which may compound this problem.

With this method the data always sums to 100%. This means that the percentages reported for each mineral are dependent upon the percentages reported for the other minerals. If one mineral is underestimated the others will be overestimated. Also, if one or more minerals are present but not detected then the percentages of the minerals that are detected will be overestimated.

Any or all of the above factors may affect the estimated weight percentages.

Data are formatted as weight percent, but are actually calculated as weight fractions. Therefore, slight rounding errors may be observed in the formatted data.

For this analytical method, the clay fraction is defined as the <4 micron ESD (Equivalent Spherical Diameter) fraction of the sample. Clay fraction does not mean clay minerals (phyllosilicates) only, it is a size term and as such this size fraction can and almost always does include non-clay minerals (quartz, plagioclase, etc.). This size fraction is used because it typically contains abundant clay minerals.

K-T GeoServices, Inc.
Whole Rock and Clay Fraction XRD
Sample Preparation and Analytical Procedures

Sample Preparation

Samples submitted for whole rock and clay mineral XRD analyses are cleaned of obvious contaminants and disaggregated in a mortar and pestle. A split of each sample is then transferred to distilled water and pulverized using a McCrone micronizing mill. The resultant powder is dried, disaggregated, and packed into a metal sample holder to produce random whole-rock mounts. A separate split of each sample is dispersed in distilled water using a sonic probe. The suspensions are then size fractionated with a centrifuge to isolate clay-size (<4 micron equivalent spherical diameter) materials for a separate clay mount. The suspensions are then vacuum deposited on nylon membrane filters to produce oriented clay mineral mounts. The clay mineral mounts are attached to glass slides and exposed to ethylene glycol vapor for approximately 12 hours.

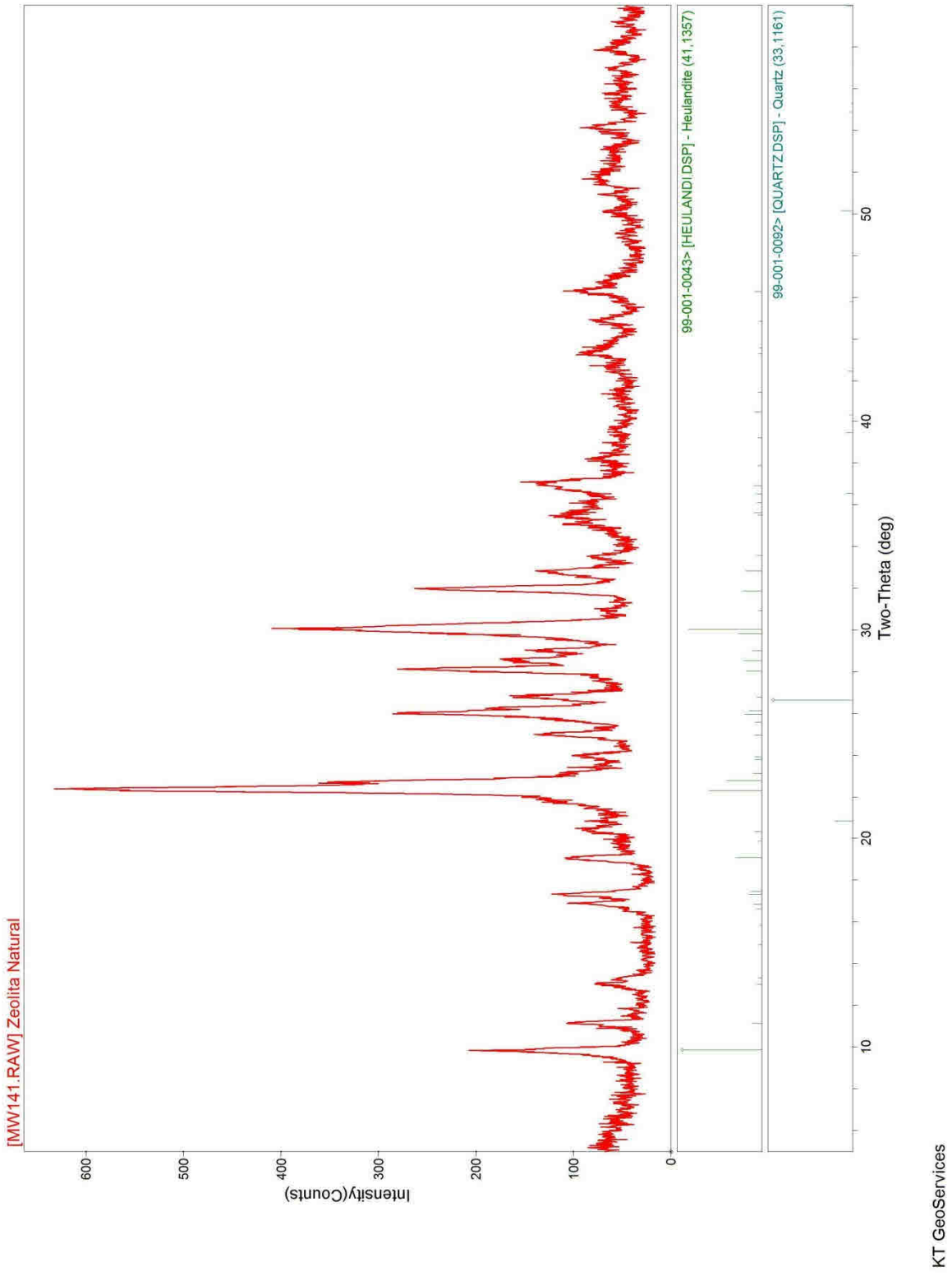
Analytical Procedures

X-ray Diffraction (XRD) analyses of the samples are performed using a Siemens D500 automated powder diffractometer equipped with a copper X-ray source (40kV, 30mA) and a scintillation X-ray detector. The whole rock samples are analyzed over an angular range of five to sixty degrees two theta at a scan rate of one degree per minute. The glycol solvated oriented clay mounts are analyzed over an angular range of two to thirty six degrees two theta at a scan rate of one degree per minute.

XRD patterns from air-dried and glycol-solvated clay-fraction samples are qualitatively analyzed to determine the types of clays present in the samples. Determinations of mixed-layer clay ordering and expandability are done by comparing experimental diffraction data from the glycol-solvated clay mounts with simulated one dimensional diffraction profiles generated using the program NEWMOD written by R. C. Reynolds.

Semiquantitative determinations of whole-rock mineral amounts are done using Jade Software (Materials Data, Inc.) with the Whole Pattern Fitting option. All quantitative data (including clay mineral amounts) come from the whole rock pattern. This is done by using Whole Pattern Fitting (WPF) and Rietveld refinement methods on the observed data. A diffraction model is fit to the measured pattern by non-linear least-square optimization in which certain parameters are varied to improve the fit of the model to the observed data. Modeling parameters include background, profile parameters, and lattice constants. For Rietveld refinement, a complete physics simulation is generally used in which crystal structures of the phases are required. Since the physics of scattering is well known, this method can be very exact and even allow adjustment of atomic coordinates, occupancies, and thermal parameters.

Bulk (Whole Rock) X-ray Diffraction Trace



Ethylene Glycol Solvated Clay Fraction (<4 micron) X-ray Diffraction Trace