

received 02/12/2011
Complaint 200294386

February 9, 2011
Lab no. 211073

Mr/Ms. H. Ackerman
Energy Laboratories, Inc
P.O. Box 3258
Casper, Wyoming 82602

Dear Mr/Ms Ackerman:

Enclosed are the x-ray diffraction ("XRD") results for sample, "C11020151-001A" received with your PO no. 2614 on Monday, February 7. This sample was analyzed on a rush basis (one business day to the next turnaround for **DRY** samples) so this report will be faxed within one business day after the sample is dry. A copy will follow by mail. We prefer to email reports. Please provide an email address and clearly PRINT your contact's name on the submittal form.

The sample was air-dried before grinding and analysis. A representative portion of the dry sample was ground to approximately -400 mesh in a steel swing mill, packed into a well-type plastic holder and then scanned with the diffractometer over the range, $3-61^{\circ} 2\theta$ using Cu-K α radiation. The ground sample was also prepared as an oriented mount by mixing ground sample with distilled water, drawing the mixture onto a cellulose acetate filter and then rolling the deposited material onto a glass disk. The oriented mount was scanned over the range $2-30^{\circ}$; treated with glycol and then re-scanned over the range $2-22^{\circ}$. Analysis of oriented mounts aids in the identification of clay minerals. The results of these scans are summarized as approximate mineral weight percent concentrations on the enclosed table. Estimates of mineral concentrations were made using our XRF-determined elemental composition and the relative peak heights/areas on the bulk XRD scan. The detection limit for an average mineral in this sample is ~1-3% and the analytical reproducibility is approximately equal to the square root of the amount. "Unidentified" accounts for that portion of the XRD scan which could not be resolved and a "?" indicates doubt in both mineral identification and amount.

Thank you for the opportunity to be of continuing service to Energy Laboratories, Inc.

Sincerely,


Peggy Dalheim

Energy Laboratories, Inc
X-Ray Diffraction RUSH Results for "C11020151-001A" Received with PO# 2614

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Mineral Name	Chemical Formula	Approx. Wt %
Quartz	SiO_2	19
K-feldspar	KAlSi_3O_8	14
Plagioclase feldspar	$(\text{Na,Ca})\text{Al}(\text{Si,Al})_3\text{O}_8$	<5
Kaolinite	$\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$	25
Smectite	$(\text{Ca,Na})_x(\text{Al,Mg,Fe})_4(\text{Si,Al})_8\text{O}_{20}(\text{OH,F})_4 \cdot n\text{H}_2\text{O}$	29
Mica/illite	$(\text{K,Na,Ca})(\text{Al,Mg,Fe})_2(\text{Si,Al})_4\text{O}_{10}(\text{OH,F})_2$	5
Chlorite	$(\text{Mg,Fe,Al})_5(\text{Si,Al})_4\text{O}_{10}(\text{OH})$	<5
"Unidentified"	?	<5

Initial pd

Date 9 Feb 2011

Analysis performed by The Mineral Lab, Inc