Frontier Analysis, Ltd

TECHNICAL SERVICE RESPONSE NO.: UT054

Subject: Analysis of Soil Samples Related to a Calf Mutilation in Depuyer, Montana (Discovered October, 2007)

Date: August 7, 2008

Requested By: John Rhodes
Reptoids Research Center

Reported By: P. A. Budinger
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Nick Reiter
Avalon Foundation

Background/Objective: A calf was found mutilated in the southern (inside) rim of a 33 ft. circle of dirt on October 2007 in Depuyer, Montana. The dirt was hydrophobic, and the stubble inside the circle was flattened. The rancher reported he found the calf the morning after an evening of rain and snow. The ground around the circle was muddy, making walking difficult. However, the dirt inside the circle was firm. The soil seemed to have a glossy surface that repelled the raindrops, and was of a lighter color than that of the surrounding area. The object is to determine whether there are any unusual materials in the soil.

Conclusions:

•Besides normal soil components, four samples contain less than 0.5 wt.% potassium nitrate. These are from 1' south of the calf, 10' north of the calf, 15' north of the calf and 25' North of the Calf. The sample from 25' north of the calf contains less nitrate than the others. No potassium nitrate is detected in the soil 10' south of the calf. The nitrate may be imparting the unusual properties observed in the circle soils.

•There is a possibility that the source of this material may be from fertilizer. The fertilizer used by the farmer is 10 (nitrogen) 42 (phosphorus) 10 (potassium). However, no phosphorus is detected, and this is in higher concentration in the fertilizer than the potassium. This might suggest the potassium nitrate is from another source, which remains unknown.

•Common uses for potassium nitrate, besides fertilizer, are: pyrotechnics, explosives, matches, reagent to modify burning properties of tobacco, glass manufacture, tempering steel, curing food, oxidizer in solid rocket propellants.[1] Also, it is commonly used as the main component (usually about 98%) of tree stump remover; it accelerates the natural decomposition of the stump.[2]

•Normal levels of magnesium are in all soils. This is a common element found in soil minerals. This comment is included because of a theory by the submitter that magnesium may be a component of UFO craft propulsion.

Procedure:

Samples: The soil samples were submitted on February 20, 2008 with the following information.

•Soil 1' south of calf
•Soil 10' south of calf
•Soil 10' north of calf
•Soil 15' north of calf
•Soil 25' north of calf (submitted as a control to the above samples)

Infrared spectra were obtained from all the 'as received' samples. Nick Reiter (The Avalon Foundation) did EDS elemental analysis. He also checked the samples with a Baird Atomic 916 ratemeter, and additionally, examined them with both long and short-wave UV lamps.

The samples were quantitatively extracted with distilled water. Infrared spectra were also acquired from the extracts. All infrared data in this analysis were obtained on Thermo Scientific's Avatar 260 spectrometer using the Smart Harrick diamond SplitPea® sampling accessory.

Results:

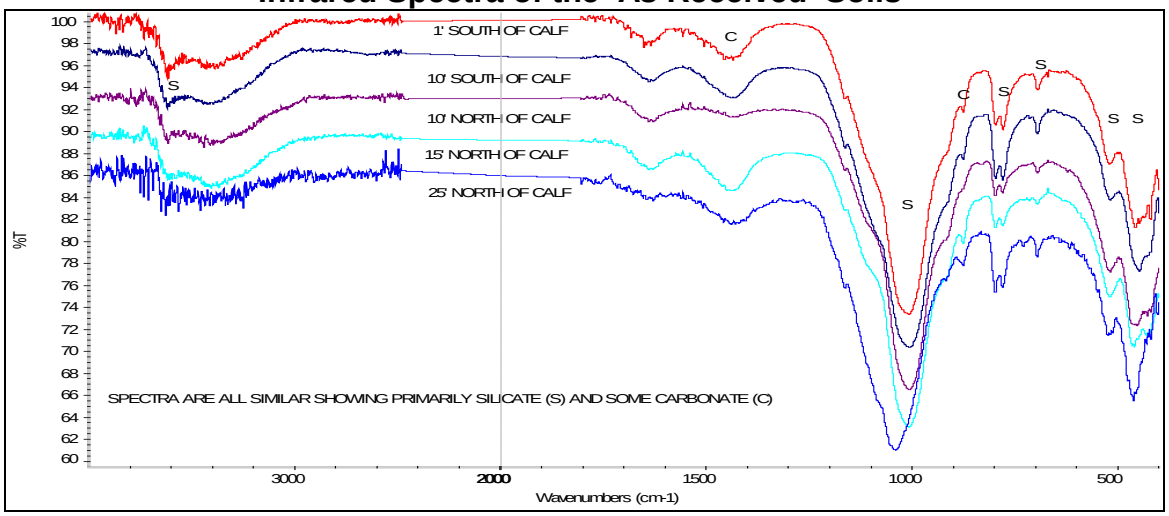
The results of the individual tests done on the samples follow. These results are summarized in the conclusions section on the page three of this report.

Analysis of the 'As Received' Soils

[1] Richard J. Lewis Sr., "Hawley's Condensed Chemical Dictionary", Fourteenth Edition, John Wiley & Sons, Inc., 2001.
[2] http://en.wickipedia.org/wiki/Potassium_nitrate.

Infrared Analysis: Infrared spectra of the 'as received' samples are all typical of soil. Primarily, silicate minerals and a small amount of calcium carbonate (calcite) are detected. Following are the spectra with pertinent bands labeled.

Infrared Spectra of the 'As Received' Soils



EDS Elemental Analysis: Very little difference can be seen between any of the samples by EDS. All appear to represent a dry clay soil, with the elemental components one would expect, in approximately the same ratios. No foreign inorganic "trace" is seen in any sample that might distinguish it from the others. Within the resolution and accuracy of the EDS, all samples are essentially identical. The total report with spectra can be found in the appendix.

Radiation Measurement: No radiation above background was detected

UV Light Inspection: No noticeable fluorescent species were observed.

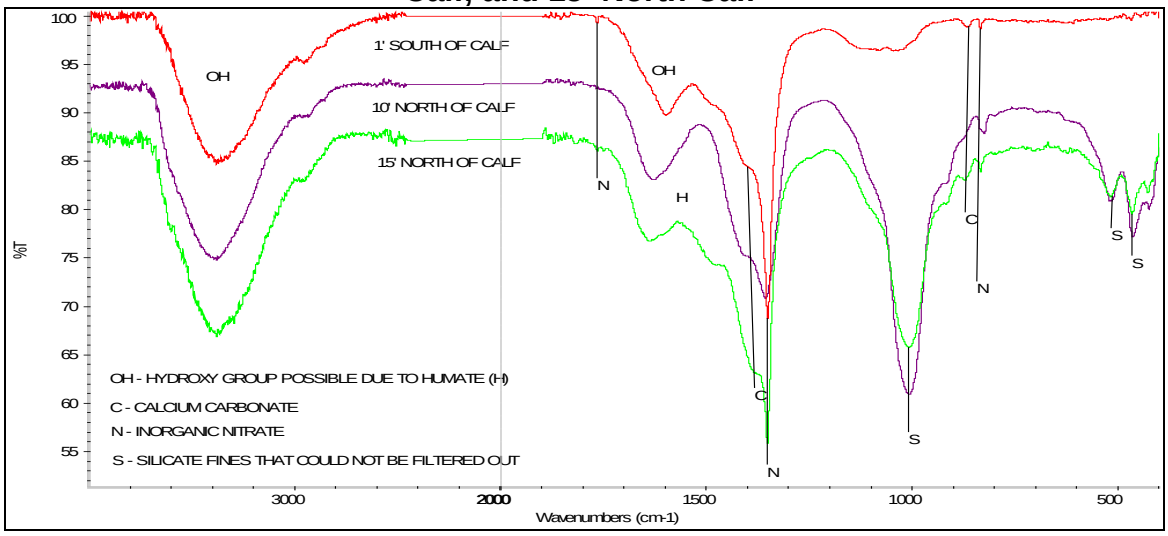
Infrared Analysis of the Water Extracts

All soils (site and controls) were extracted quantitatively with water to isolate unusual materials. Less than 1 wt.% of the soils contain water-soluble materials, and roughly half were silicate fines, which are difficult to filter out. The following table shows the amounts of materials extracted for each sample.

Sample	Wt.%
1’ S of Calf	0.32
10’ S of Calf	0.35
10’ N of Calf	0.60
15’ N of Calf	0.57
25’ N of Calf	0.31

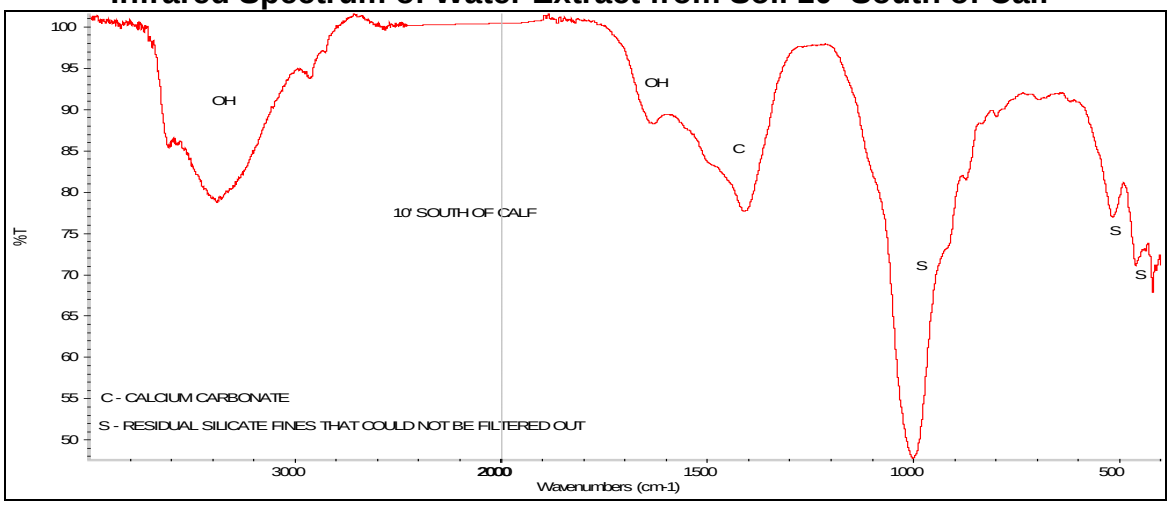
Analysis of water extracts from 1’ south of the calf, 10’ north of the calf, and 15’ north of the calf: Infrared analysis of the extracts from 1’ south of the calf, 10’ north of the calf, and 15’ north of the calf are most similar to each other, so they are written up together. The spectra show typical components found in soil. These include humates, inorganic carbonates, and fine, unfilterable silicate mineral. Additionally present is potassium nitrate. Band ratios show these materials are unevenly distributed. Following are the spectra of the soil extracts from1’ south of the calf, 10’ north of the calf, and 15’ north of the calf.

Infrared Spectra of Water Extracts from Soils 1’ South of Calf, 10’ north of Calf, and 15’ North Calf



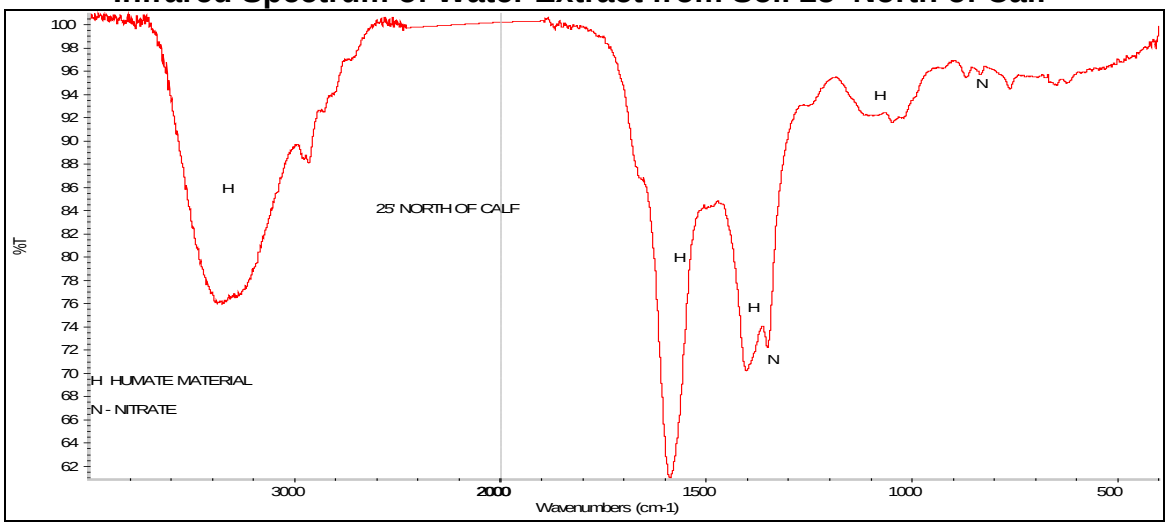
Water Extract from Soil 10’ South of the Calf: The infrared spectrum of this extract is different than the above extracts. It shows primarily residual silicate fines that could not be filtered out. There is a smaller amount of inorganic carbonate. Some material containing OH groups is present, which may be due to hydration on the inorganics and/or from some soluble humate type materials. It is significant that no nitrate is detected.

Infrared Spectrum of Water Extract from Soil 10' South of Calf



Water Extract from Soil 25' North of the Calf: Infrared analysis of this sample shows primarily soluble humate material. A small amount of nitrate, presumably potassium nitrate, is also present.

Infrared Spectrum of Water Extract from Soil 25' North of Calf

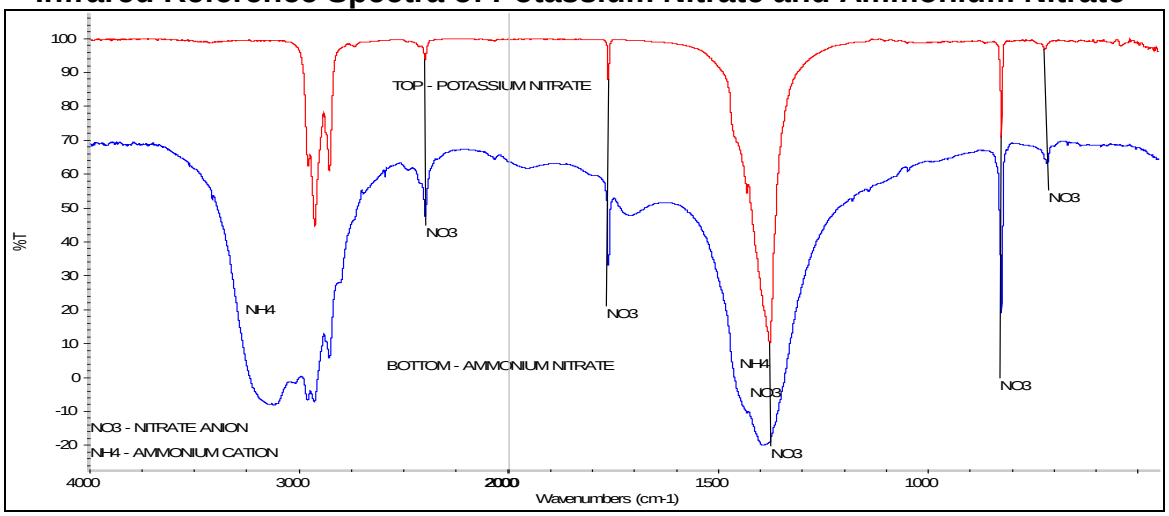


Comment on Differentiation of Potassium Nitrate from Ammonium Nitrate

Initial inspection of the spectra from the water extracts suggested that ammonium nitrate was the specific nitrate detected. Additional elemental analysis, and re-inspection of the infrared spectra, indicated that the nitrate component is potassium nitrate instead. It is worthwhile to discuss the differences between the spectra of the two nitrates to show how they can be misinterpreted in the analyses of the soil extracts.

The nitrate anion infrared bands for both ammonium nitrate and potassium nitrate are identical. The potassium cation does not absorb in the infrared region because it is not polyatomic. The ammonium cation does absorb between 3500-3000 cm^{-1} and 1500-1300 cm^{-1}. However, the humate and any hydrated material also have OH absorption in the 3500-3000 cm^{-1} region. Also, a strong nitrate band absorbs in the 1500-1300 cm^{-1} region, and so the ammonium band would be combined with it producing a broader asymmetrical absorption band. For these samples, the sharpness and band intensity between 1500-1300 cm^{-1} compared to the absorption between 3500-3000 cm^{-1} suggest there is no ammonium contribution. Following are the spectra of potassium nitrate and ammonium nitrate for reference.

Infrared Reference Spectra of Potassium Nitrate and Ammonium Nitrate



FILE: UT054

Phyllis A. Budinger

Addendum

XRD Spectra
Tabulated Elemental Results

EDS analysis performed for P. Budinger
18 July 2008

N. Reiter
The Avalon Foundation

Description of samples:

Five ziplocked plastic bags were received from PB in March of 2008. These contained small volumes of dried soil from a livestock mutilation case occurring in Canada in 2007. The bags were labeled as follows, and given the sample number designation following in red by NR:

Sample 1 – "Location 1 ft S of calf. Sampled 15 Oct 2007. Event date 5 Oct 2007."
Sample 2 – "Location 25 ft N of calf. Sampled 15 Oct 2007. Event date 5 Oct 2007." This sample bag was also labeled "control."
Sample 3 – "Location 10 ft S of calf. Sampled 15 Oct 2007. Event date 5 Oct 2007."
Sample 4 – "Location 10 ft N of calf. Sampled 15 Oct 2007. Event date 5 Oct 2007." This sample bag was also labeled "best sample."
Sample 5 – "Location 15 ft N of calf. Sampled 15 Oct 2007. Event date 5 Oct 2007."

Visually, there appears to be little difference among any of the five samples. Sample 2 appeared to be more pulverized than the others. However, in hue and granularity, all are similar.

EDS Analysis:

SEM- Jeol 6390
EDS – EDAX Genesis

Small "clumps" of each soil sample were placed on graphite SEM stubs and affixed with dabs of graphite cement. All were gold sputtered to reduce charging, thus a small gold peak is noted on all EDS scans. The samples were examined at 500X, 20kV accel. Combined photo location and EDS spectra report format was used, and these files were saved at jpg. Two samples, sample 1 and sample 2 were also examined using the semi-quantitative software on our EDS. All EDS was taken using a broad view option, rather than minimum spot-size.

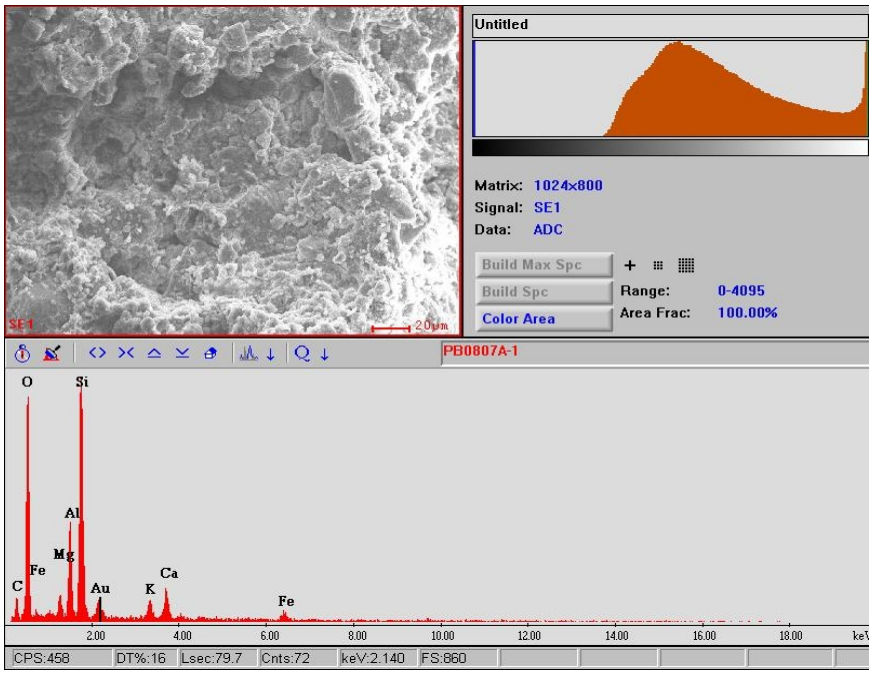
This should allow for a more compositionally averaged spectrum. These files are all attached separately.

Results and Interpretation:

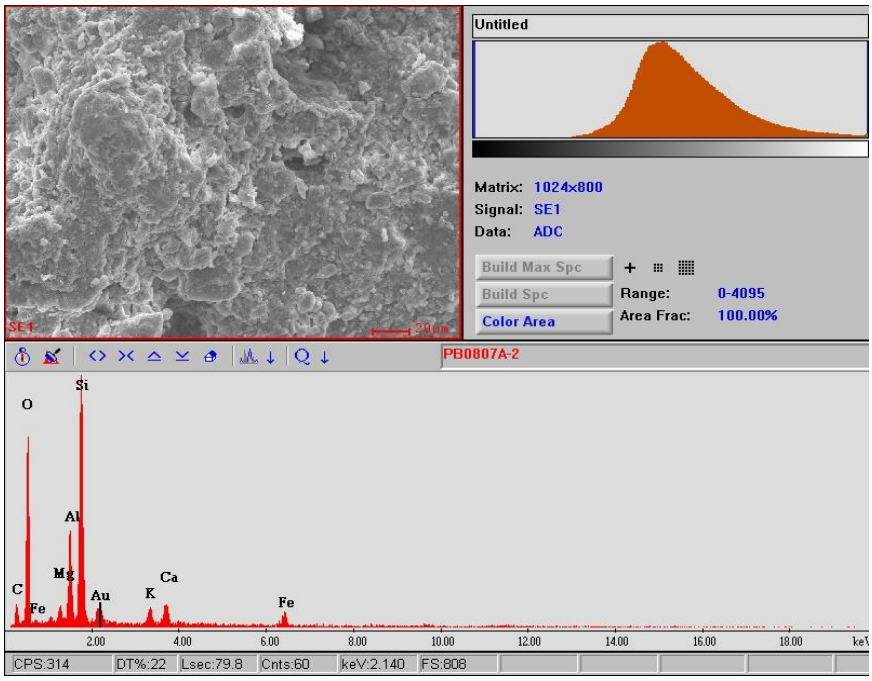
Very little difference can be seen among any of the samples by EDS. All appear to represent a dry clay soil, with the elemental components one would expect in approximately the same ratios. No foreign inorganic “trace” is seen in any sample that might distinguish it from the others. Within the resolution and accuracy of the EDS, all samples are essentially identical.

All soil samples were checked with a Baird Atomic 916 ratemeter. No unusual levels of radioactivity above ambient were noted.

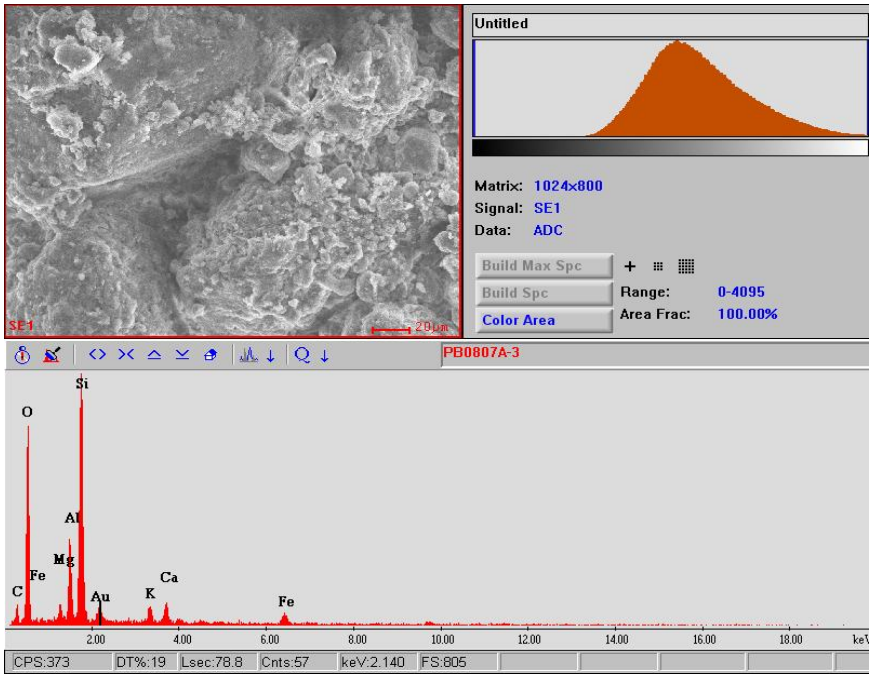
All soil samples were examined with both long and short-wave UV lamps, and no noticeable fluorescent species were observed. The data follow.



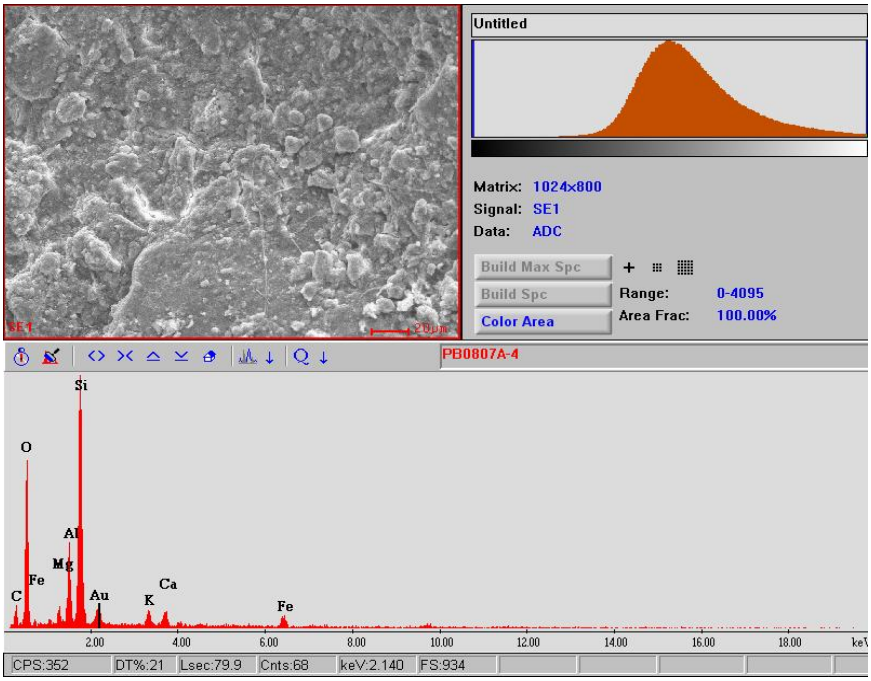
Soil 1’ South of Calf



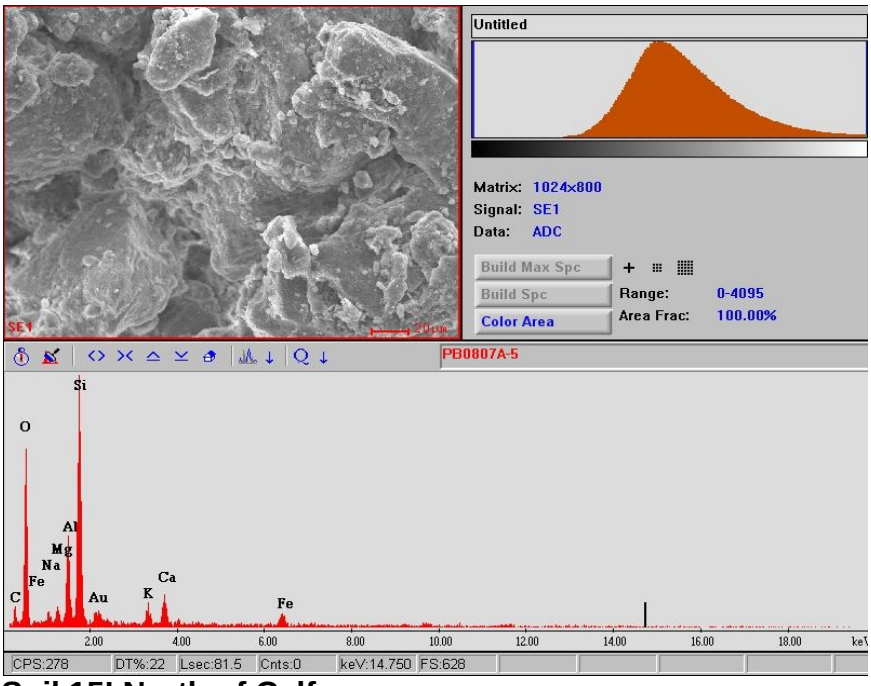
Soil 25’ North of Calf



Soil 10’ South of Calf



Soil 10’ North of Calf



Soil 15’ North of Calf

c:\edax32\genesis\genspc.spc
Label : PB0807A-1 quant
Acquisition Time : 16:31:38 Date:17-Jul-2008

kV : 20.00 Tilt: 0.00 Take-off:34.81 AmpT : 51.2
Detector Type:SUTW, Sapphire Resolution:130.37 Lsec:100

EDAX ZAF Quantification (Standardless)
Element Normalized
SEC Table : Default

Element	Wt %	At %	K-Ratio	Z	A	F
C K	18.13	28.61	0.0347	1.0463	0.1828	1.0004
O K	41.57	49.23	0.1059	1.0287	0.2476	1.0003
NaK	0.25	0.21	0.0009	0.9628	0.3716	1.0028
MgK	1.57	1.22	0.0081	0.9870	0.5206	1.0052
AlK	5.85	4.11	0.0367	0.9580	0.6498	1.0072
SiK	18.30	12.35	0.1285	0.9859	0.7117	1.0007
AuM	5.47	0.53	0.0382	0.6938	1.0058	1.0002
K K	2.16	1.05	0.0182	0.9357	0.8949	1.0056
CaK	3.20	1.51	0.0282	0.9576	0.9176	1.0017
FeK	3.49	1.18	0.0304	0.8710	0.9962	1.0048
Total	100.00	100.00				

Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	5.73	0.26	4.36	22.04
O K	46.30	0.51	1.49	90.78
NaK	0.56	1.57	34.35	0.36
MgK	5.15	2.02	5.89	2.55
AlK	23.07	2.03	2.26	11.36
SiK	75.37	2.01	1.18	37.50
AuM	6.13	1.90	5.14	3.23
K K	7.34	1.76	4.49	4.17
CaK	10.33	1.56	3.55	6.62
FeK	5.11	0.75	5.03	6.81

c:\edax32\genesis\genspc.spc
Label : PB0807A-2 quant
Acquisition Time : 16:26:08 Date:17-Jul-2008

kV : 20.00 Tilt: 0.00 Take-off:36.74 AmpT : 51.2
Detector Type:SUTW, Sapphire Resolution:130.37 Lsec:100

EDAX ZAF Quantification (Standardless)
Element Normalized
SEC Table : Default

Element	Wt %	At %	K-Ratio	Z	A	F
C K	18.46	29.25	0.0354	1.0470	0.1831	1.0004
O K	40.04	47.62	0.1027	1.0294	0.2492	1.0004
NaK	0.40	0.33	0.0015	0.9634	0.3814	1.0029
MgK	1.48	1.16	0.0078	0.9876	0.5303	1.0054
AlK	6.56	4.63	0.0418	0.9586	0.6597	1.0072
SiK	18.18	12.32	0.1282	0.9865	0.7142	1.0008
AuM	4.83	0.47	0.0336	0.6941	1.0007	1.0002
K K	2.65	1.29	0.0225	0.9362	0.9016	1.0058
CaK	3.11	1.48	0.0275	0.9582	0.9211	1.0021
FeK	4.30	1.46	0.0375	0.8715	0.9966	1.0043
Total	100.00	100.00				

Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
C K	5.16	0.21	4.58	24.57
O K	39.09	0.38	1.61	102.87
NaK	0.79	1.39	23.92	0.57
MgK	4.24	2.13	6.88	1.99
AlK	22.49	2.52	2.33	8.92
SiK	64.25	2.42	1.29	26.55
AuM	4.67	1.80	6.16	2.59
K K	7.73	1.20	4.12	6.44
CaK	8.57	1.08	3.82	7.94
FeK	5.35	0.74	4.88	7.23