



Hygieneering, Inc.

Industrial hygiene, safety and environmental consulting services

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February 7, 2025

Via E-mail: lcmalina@ktjlaw.com

Mr. Lance Malina
Partner
Village of Mount Prospect
C/O Klein, Thorpe and Jenkins, Ltd.
120 S. LaSalle St., Suite 1710
Chicago, IL 60603

**RE: Particle ID Assessment – Prestige Feed - DRAFT
Hygieneering Project # 2025-11242**

Dear Mr. Malina,

Thank you for the opportunity for Hygieneering, Inc. (Hygieneering) to provide professional consulting services to Klein, Thorpe and Jenkins, Ltd. This report presents the findings concerning the unknown black particles that have been deposited on vehicles near the Prestige Feed Facility in Mount Prospect, IL.

Background

According to Klein, Thorpe and Jenkins, Ltd., there have been odor complaints associated with the Prestige Feed Facility in Mount Prospect, IL, which processes dairy products into animal feed. In addition to the odor complaints, it was reported that there has been black particles observed on vehicles parked near the Prestige Feed Facility.

In response to the presence of the particles, Hygieneering was requested to submit a sample of black particles for characterization and composition.

Sample Collection

The Village of Mount Prospect parked a village vehicle near 660 Middleton, Des Plaines, Illinois on December 30, 2024. The vehicle's exterior was cleaned by the Village of Mount Prospect's Public Works Department prior to being parked outside. On the afternoon of Friday January 3, 2025, Hygieneering collected a surface sample of the particles on the vehicles hood. A second backup sample was collected from the vehicle's front windshield. The sample was collected using an alcohol wipe, per the lab's requirements. An approximately 2 square foot area of the hood was used for the sample. Photographs 1-2 show the sample collected from the hood.

According to Village of Mount Prospect representatives the Prestige Feed Facility had operated prior to the sample collection.



Photograph 1



Photograph 2

The surface sample was submitted to EMSL of Cinnaminson, NJ for a Full Particle ID analysis. The following analysis was performed on the surface sample:

- Polarized Light Microscopy (PLM)
- Stereo Microscopy
- epi-Reflected Light Microscopy (RLM)
- Scanning Electron Microscopy/Energy Dispersive X-Rays (SEM/EDX)
- Gas Chromatography - Mass Spectrometry (GC-MS)

The detailed report is provided in **Attachment 1**, Full Particle ID Report.

The following is a summary of the findings:

The surface particles are composed primarily of a mixture of components associated with construction dust (calcite/dolomite, feldspars/micas/clays, quartz, gypsum/anhydrite, rust/iron oxides, paint, wood/lumber fragments, and fibrous glass). Lower amounts of pollen, mold, diatoms, natural plant fragments, starch, insect fragments, processed cellulose/cotton, synthetic fibers, skin fragments, rubber dust, and organic/polymeric material are also present.

Additionally, no semi-volatile organic compounds (including fatty acids) were detected in the sample. These materials may be associated with odors and biological materials including some food products.

One of the three Scanning Electron Microscopy/Energy Dispersive X-Rays elemental spectrum of an agglomeration of material did have a high concentration of carbon-based materials (~46%); however, the source of the carbon was not specified. The Polarized Light Microscopy did identify wood fragments in the particles, which may be the source of carbon since soot and other potential carbon-based particles were not specifically identified.



Conclusions and Recommendations

Hygieneering collected a surface sample of particles deposited on a previously cleaned vehicle near the Prestige Feed Facility in Mount Prospect, IL. Results from the Full Particle ID did not conclusively find particles specifically associated with the reported odors or presumed animal feed processing.

Thank you for the continued opportunity to provide quality environmental, health and safety services to Klein, Thorpe and Jenkins, Ltd.

Respectfully Submitted,
Hygieneering, Inc.

David L. Zeidner, MS, CMR, WRT, LEED AP
Director of Indoor Air Quality Services

Travis Fellers, CIH, CSP
Managing Director, Technical Services

DRAFT



ATTACHMENT 1

**FULL PARTICLE ID
LABORATORY REPORT**

DRAFT



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EMSL Order ID: 362500143
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Date of Reporting: 1/30/2025
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Reported By: E. Mirica

- Laboratory Report -

Full Particle Identification

Project: Klein Thorpe & Jenkins

Conclusions:

- The material found in sample 1 is composed primarily of a mixture of components associated with construction dust (calcite/dolomite, feldspars/micas/clays, quartz, gypsum/anhydrite, rust/iron oxides, paint, wood/lumber fragments, and fibrous glass). Lower amounts of pollen, mold, diatoms, natural plant fragments, starch, insect fragments, processed cellulose/cotton, synthetic fibers, skin fragments, rubber dust, and organic/polymeric material are also present.
- No semi-volatile organic compounds (including fatty acids) were detected in the sample.

Procurement of Samples and Analytical Overview:

The material for analysis (one, wipe) arrived at EMSL Analytical (Cinnaminson, NJ) on January 10, 2025. The package arrived in satisfactory condition with no evidence of damage to the contents. The purpose of the analysis is to determine the identification of the individual components. The data reported herein has been obtained using the following equipment and methodologies.

Methods & Equipment: Polarized Light Microscopy (PLM)
Stereo Microscopy
epi-Reflected Light Microscopy (RLM)
Scanning Electron Microscopy/Energy Dispersive X-Rays (SEM/EDX)
Gas Chromatography - Mass Spectrometry (GC-MS)

Analyzed by:

Christen Helou
Assistant Laboratory Manager

January 30, 2025
Date

Reviewed/Approved:

Eugenia Mirica, Ph.D.
Laboratory Director

January 30, 2025
Date



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Sample Description:

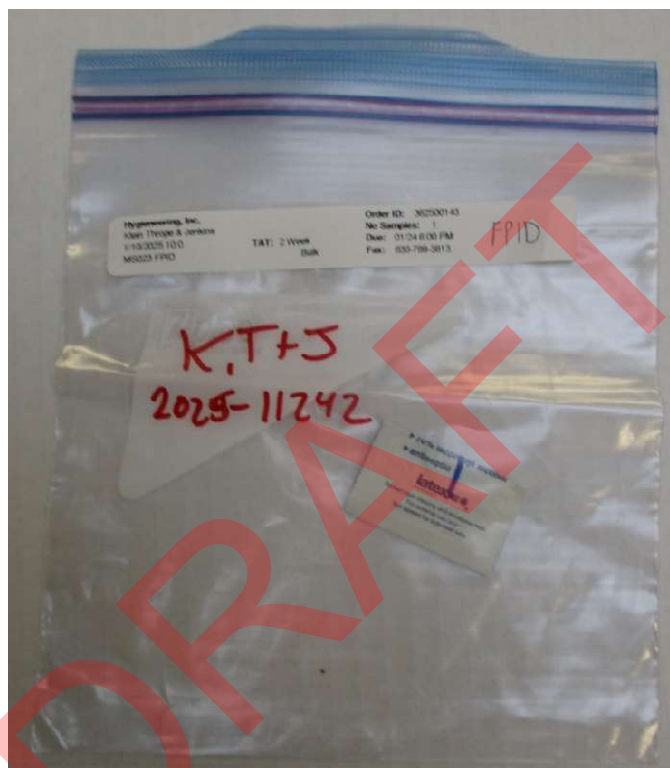


Figure 1. Image of the sample received for analysis.

Table 1: Description of the sample submitted for analysis.

Sample	Description	Date Sampled	Analysis / Purpose
1 362500143-0001	Vehicle Hood	1/2/25 2 pm	Identification of the particles

Sample Preparation Procedures:

The sample was initially observed in the as-received condition to observe general constituency and homogeneity.

Half of the as-received wipe sample was individually sonicated for 10 minutes in a sealable plastic vial with 15 ml isopropanol (enough amount to cover the sample) to extract the particles in suspension. The resulting suspension was filtered onto a PC filter using vacuum filtration. The particles on the filter were subjected to the analysis.

The second half of the wipe sample was placed into a glass test tube. Dichloromethane was added until the wipe was submerged in solvent. The sample was sonicated for thirty minutes. The dichloromethane solution was extracted from the wipe sample and analyzed by GC-MS. The results were assessed by tentative match with the NIST library.



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Results:

Table 2: Components found in sample 1

EMSL Sample Identification:		362500143-0001			
Sample Identification:		1			
Sample Description:		Vehicle Hood			
Common Building Dust:		(%)	Fibrous Particulate:		(%)
Gypsum/Anhydrite	1		Asbestos:	Total	ND
Quartz	10		MMVF's:	Fibrous Glass	1
Calcite/Dolomite	35			Mineral Wool	ND
Clays/Feldspar/Mica	20			RCF's	ND
Cement Dust	ND				
Rust/Iron Oxides	7		Paper Fibers/Dust:	(Total)	ND
Zinc Oxide	ND				
Aluminum Oxide/Hydroxides	ND		Textiles:	Processed Cellulose/Cotton	1
Paint/ Pigments/ Plaster	2			Synthetics	1
Wood/ Lumber Fragments	2				
Adhesive	ND				
Mixed Building Agglomerate	ND				
Biological:		(%)	Additional Particulate:		(%)
Natural Plant Matter: Fragments	<1		Hair:	Human	ND
Trichomes	ND			Animal	ND
Pollen	1			Skin Fragments	<1
Natural Starch	2				
Microorganisms: Fungi (spores)	2		Sample Specific:	Rubber Dust	7
Hyphae	ND			Organic/Polymeric Material	2
Diatoms/Algae	<1				
Insects: Fragments	<1				
Moth Scales	ND				
Dust Mites	ND				
Unidentified Inert Organics:	2		Unidentified Inorganics:		ND

Comments: LOQ ~1% by Visual Area Estimation (VAE)

The general composition of the sample is 78% common building dust, 2% paper and textiles, 1% human/animal detritus, 4% natural plant-based particles, 1% insects and insect fragments, 3% microorganisms (mold), 9% additional particles, and 2% unidentified material.

Quartz and calcite are indicative of concrete and mortar dust. Gypsum is indicative of drywall and joint compounds.

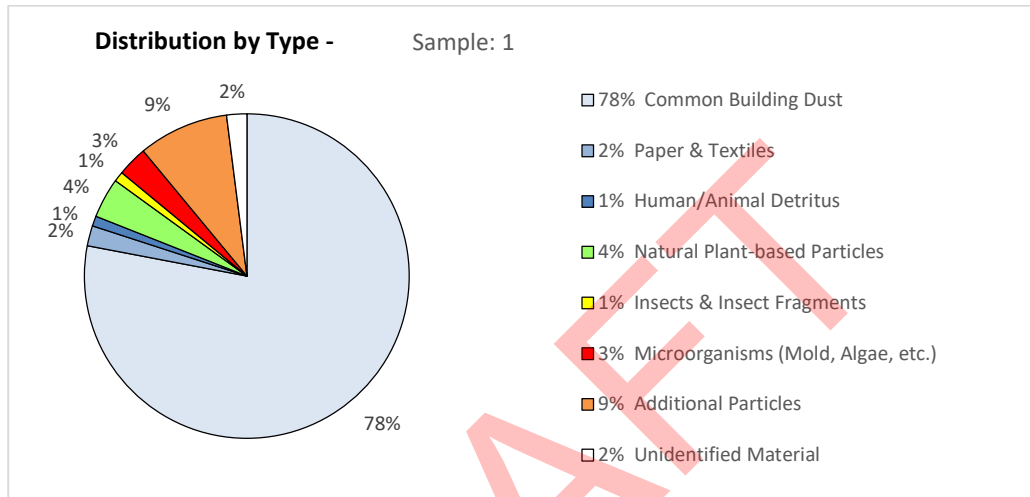


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Comments:

Common Building Dust - Building dust originating from cement and wallboard, insulation, paint etc.
Paper & Textiles - Cotton, polyester, nylon, tissues, cardboard etc.
Human/Animal Detritus - Common human and animal detritus such as hair and skin fragments
Biological (Plant-based) - Plant matter, trichomes, pollen and starch
Biological Insect - Whole insects and insect fragments
Biological (Microorganisms) - Mold, Algae, Diatoms
Additional Particles - Items noted that are not commonly observed in samples subjected to this analysis
Unidentified - Materials that require a more comprehensive analysis for identification



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Table 3. – Summary of results of the GC-MS analysis of extract from 1

EMSL Sample Identification:	362500143-0001
Sample Identification:	1
Sample Description:	Vehicle Hood
Compound	Qualifier
Semi-Volatile Organic Compounds	Not Present; No fatty acids were detected.



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Definition of terms:

Asbestos: Generic designation referring usually to six types of naturally occurring mineral fibers that belong to two mineral groups: serpentines (chrysotile) and amphiboles (crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, and actinolite).

MMVF's (Man Made Vitreous fibers): Synthetic vitreous/amorphous inorganic fibrous materials, primarily silica-based containing various amounts of other oxides (e.g., aluminum, boron, calcium, or iron oxides). The category is composed of: Fibrous glass (FG), Mineral Wool (MW), and Refractory Ceramics Fibers (RCF's). FG and MW are typically used as insulating materials; RCF's are used in high temperature applications.

Quartz: Crystalline form of silicon dioxide/silica (SiO_2), the second most common mineral in Earth's crust; commonly found in sand/soils, various rocks, concrete and mortar.

Calcite/Dolomite: A mineral which contains calcium carbonate (CaCO_3). This is an abundant mineral on the earth surface. Dolomite is a mineral which contains calcium magnesium carbonate $\text{CaMg}(\text{CO}_3)_2$. Calcite and dolomite are very similar minerals, used for ornamental stones, in concrete mixes, in soil remediation projects.

Gypsum: Calcium sulfate dehydrate mineral ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) commonly used for wallboard in buildings; concrete for highways, bridges, soil conditioner.

Feldspars: Aluminum silicates containing varying amounts of calcium, potassium, or sodium, the most common minerals in Earth's crust; used as fluxing agents in ceramics and glass production, as fillers in paints, plastics, rubber adhesives, paper.

Clays: Large group of hydrous silicates composed mainly of silica, alumina, and water with varying amount of iron, alkaline, and alkaline earth elements; used commonly in construction materials, manufacturing of paper, refractories, rubber, dinnerware and pottery, floor and wall tile, sanitary wear, absorbent and filtering materials, and cosmetics.

Rust/Iron Oxides: A mixture of iron oxides formed by the redox reaction of iron (from metal surfaces) and oxygen (from air) in the presence of water or air moisture.

Skin fragments: Shed human skin cells.

The unidentified inert organic dust consists of particles with carbon-based composition. They are inert (they do not react with the surrounding media) and they could not be isolated for individual identification. This category may include degraded skin fragments, cellulosic and polymeric remnants, degraded rubber fragments.



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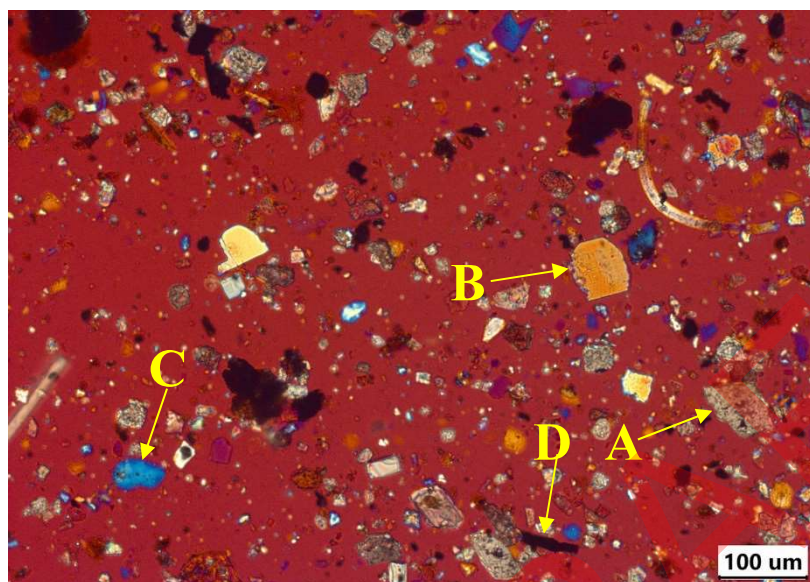
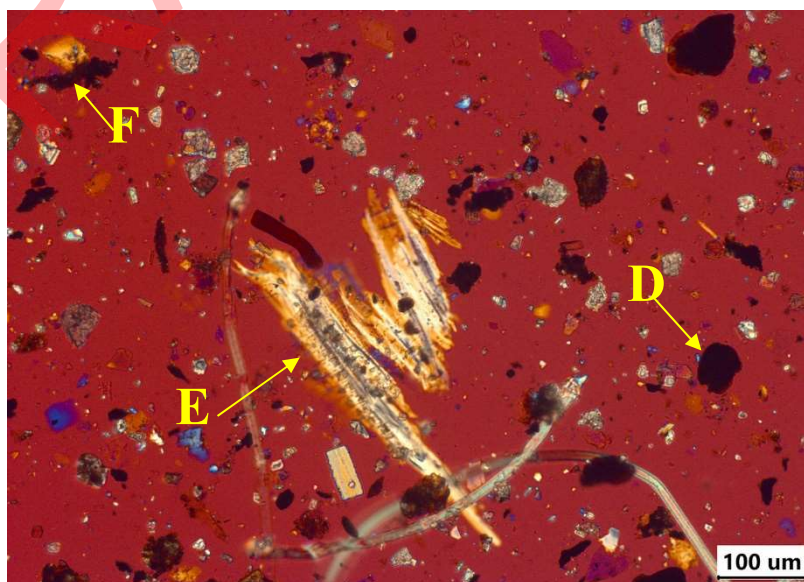


Figure 2. PLM image of particles in sample 1

A: Calcite/Dolomite
B: Feldspar
C: Quartz
D: Rust/Iron Oxide

Figure 3. Additional PLM image of particles in sample 1

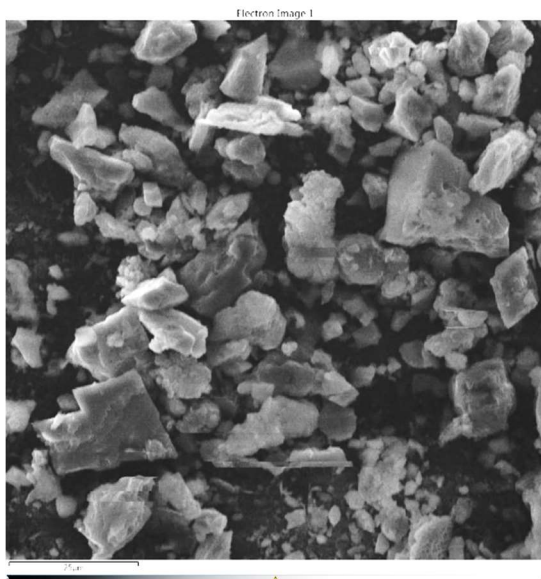
D: Rust/Iron Oxide
E: Wood
F: Rubber Dust





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Element	Weight %
C	42.49
O	42.92
Mg	2.81
Al	0.91
Si	2.97
Ca	5.58
Fe	0.87
K	0.36
Na	0.43
S	0.35
Ti	0.2
Cl	0.11
Total	100

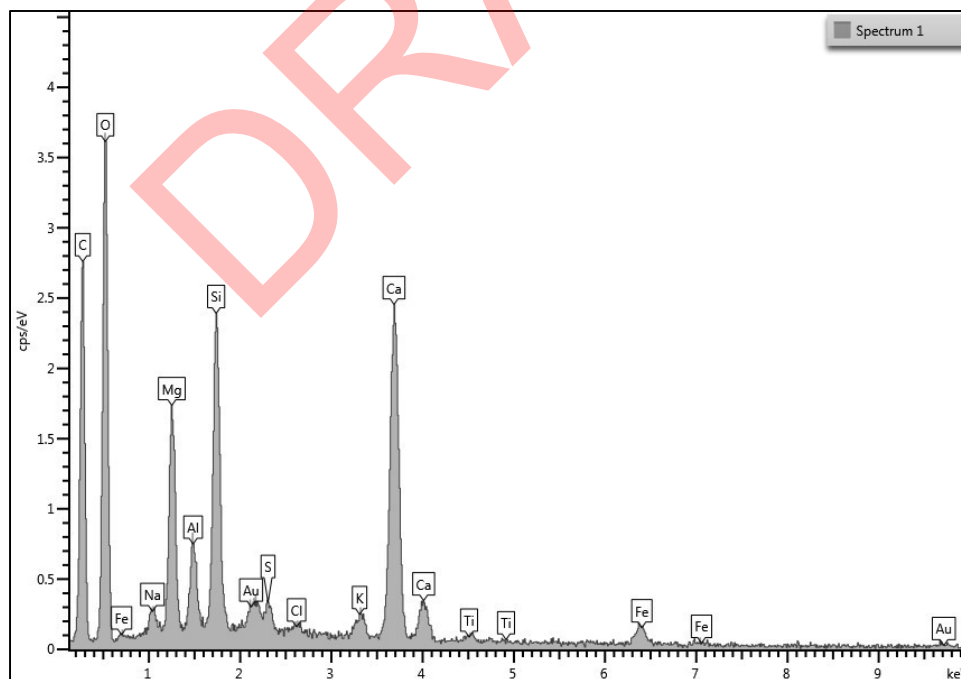


Figure 4: SEM/EDX elemental spectrum of an agglomeration of material from sample 1 showing carbon (C) as the main component. Oxygen (O), sodium (Na), magnesium (Mg), aluminum (Al), silicon (Si), sulfur (S), chlorine (Cl), potassium (K), calcium (Ca), titanium (Ti), and iron (Fe) are also present. The sample was coated with gold (Au) to minimize electron charging.



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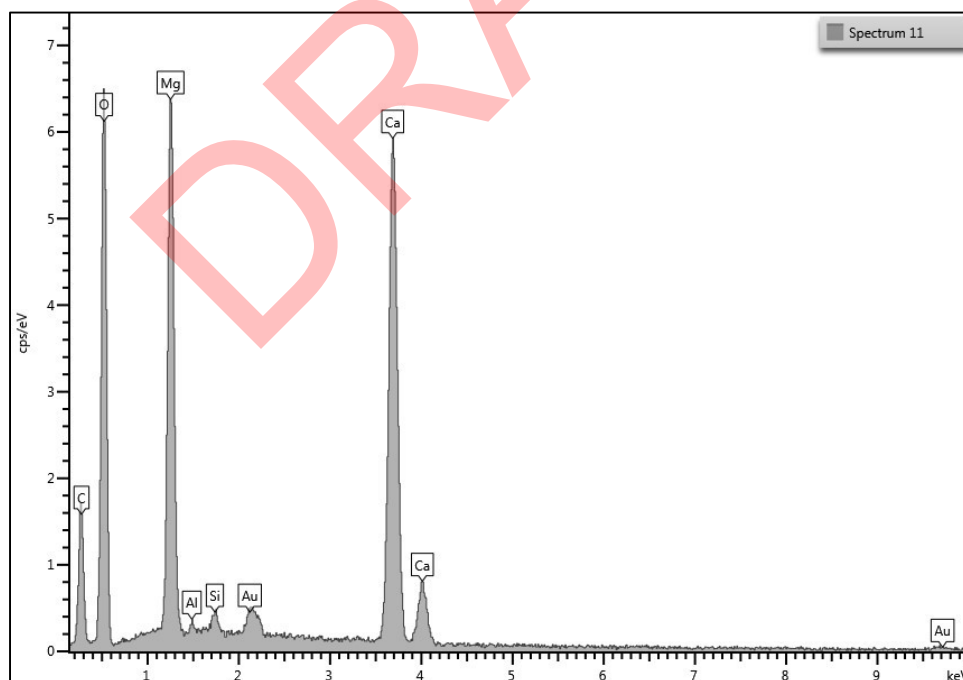
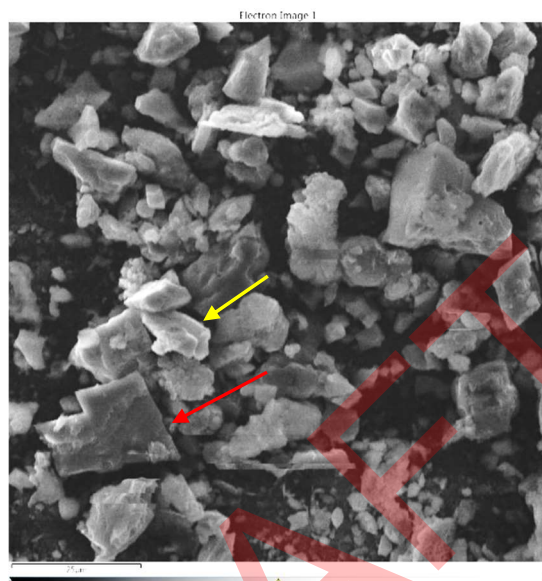


Figure 5. SEM image and EDX spectrum of particle in sample 1 showing the presence of dolomite (red arrow). The sample was coated with gold (Au) to minimize electron charging.



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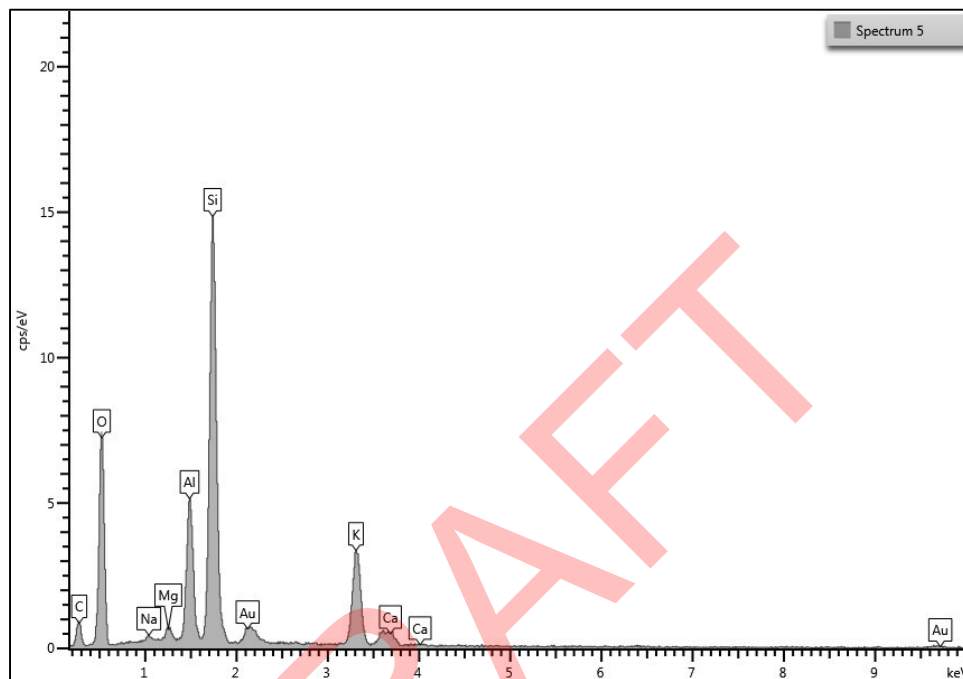


Figure 6. EDX spectrum of another particle in sample 1 (yellow arrow in Figure 5) showing the presence of feldspar/aluminum silicate. The sample was coated with gold (Au) to minimize electron charging.



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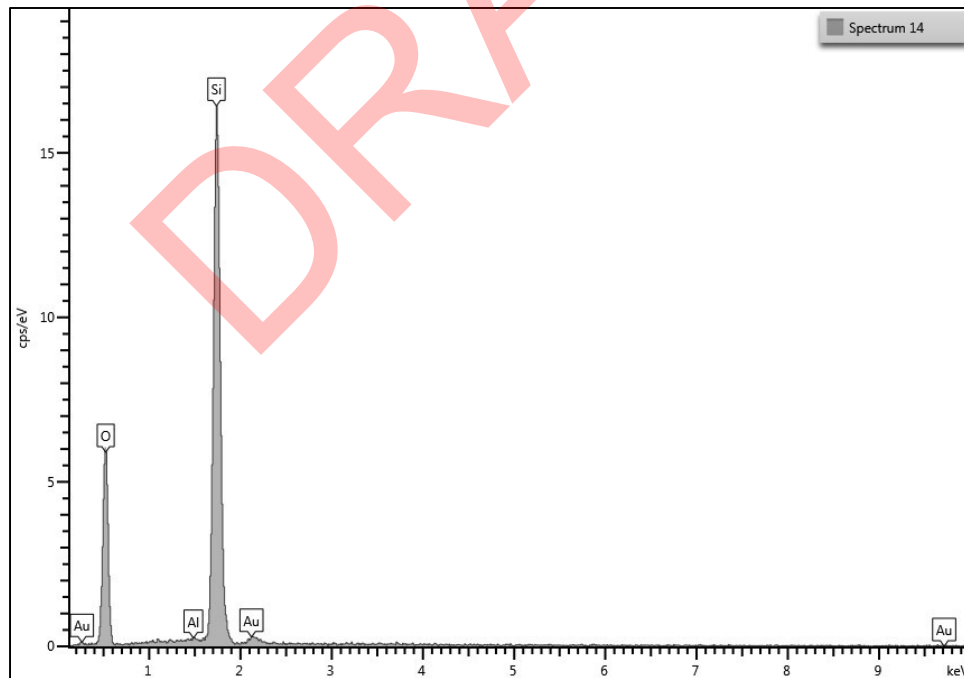
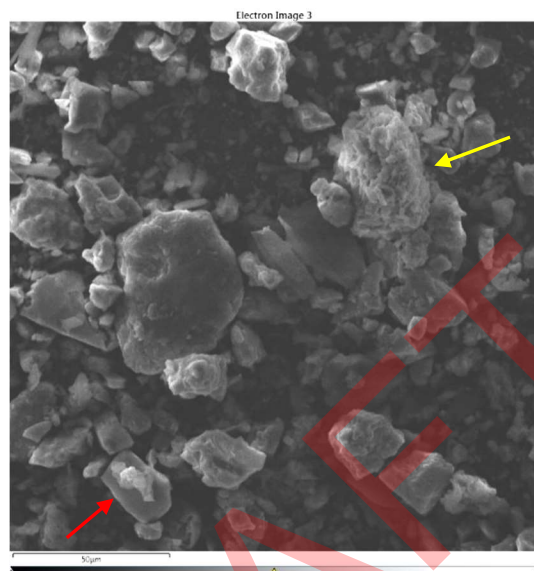


Figure 7. SEM image and EDX spectrum of particle in sample 1 showing the presence of quartz (red arrow). The sample was coated with gold (Au) to minimize electron charging.



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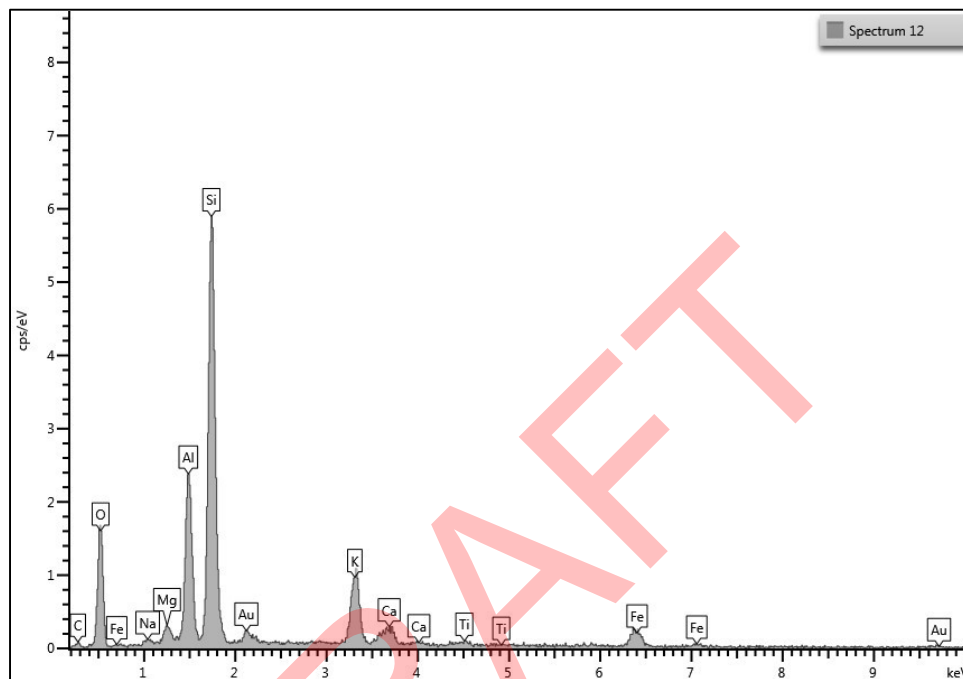


Figure 8. EDX spectrum of another particle in sample 1 (yellow arrow in Figure 7) showing the presence of clays/aluminum silicate. The sample was coated with gold (Au) to minimize electron charging.



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Descriptions & Definitions:

None Detected (ND) denotes the absence of analyte in the subsample analyzed. Trace levels of the analyte may be present in the sample below the limit of detection (LOD).

Limit of Detection (LOD): The minimum concentration that can be theoretically achieved for a given analytical procedure in the absence of matrix or sample processing effects. Particle analysis is limited to a single occurrence of an analyte particle in the sub-sample analyzed.

Limit of Quantitation (LOQ): The minimum concentration of an analyte that can be measured within specified limits of precision and accuracy during routine laboratory operating conditions

Trace concentration: denotes the presence of an analyte above LOD but below LOQ. When results are reported as Trace Concentration, at least one particle was detected in the collection of particles that represents the sample.

Concentrations for bulk samples are derived from Visual Area Estimation (VAE) unless otherwise noted. Air sample concentrations are calculated to particles per unit volume.

VAE technique estimates the relative projected area of a certain type of particulate from a mixture of particulate by comparison to data derived from analysis of calibration materials having similar texture and particulate content. Due to bi-dimensional nature of the measurements, in some cases the particle thickness could affect the results.

Important Terms, Conditions, and Limitations:

Sample Retention: Samples analyzed by EMSL will be retained for 60 days after analysis date. Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling may be returned to the client immediately. EMSL reserves the right to charge a sample disposal or return shipping fee.

Change Orders and Cancellation: All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for holding times that are exceeded due to such changes.

Warranty: EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures, when available. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

Limits of Liability: In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to ensure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.

The data and other information contained in this report, as well as any accompanying documents, represent only the samples analyzed. They are reported upon the condition that they are not to be reproduced wholly or in part for advertising or other purposes without the written approval from the laboratory.