

New York State Department of Environmental Conservation

Division of Air Resources

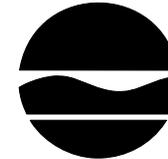
Bureau of Air Quality Surveillance – Air Pollution Microscopy Lab

625 Broadway, Albany, New York 12233-3256

Phone: (518) 525-2741 • Fax: (518) 525-2730

Website: www.dec.ny.gov

Dlhershe@gw.dec.state.ny.us



Joe Martens
Commissioner

TO: Al Carlacci

DATE: August 30, 2012

FROM: Dan Hershey

SUBJECT: Attica Residential Samples –Hillcrest Industries Source samples – Wyoming County

In response to residential complaints, samples were collected in the Hillcrest Industrial area of Attica by Michael Emery. Region 9 collected the samples and submitted them to the BAQS Microscopy Lab for analysis. The lab was asked to determine the composition of the dust impacting the neighbourhood and also to determine if a source or sources at Hillcrest Industries was contributing to the problem. Also of concern was if the particulate was of respirable size (< 2.5 microns).

Analysis has shown that the four residences are impacted by particulate from Hillcrest Industries. Although <2.5 micron particles were observed in the samples, it appears that the majority of particles attributed to Hillcrest were above the 2.5 respirable standard. Approximately 1%-7% of the crushed glass in the residential samples was found to be in the 2.5 -10 micron range.

Of the 5 residential complainant samples, all had some impact from one or more sources at Hillcrest. Of the many sources investigated, the particulate most closely matched source samples I and J (crushed clear glass that feeds the bead furnace and fines from the furnace cyclone #1). In addition to the glass spheres and fractured glass, some slag product was identified (sample C). New sand and baghouse dust did not seem to be of issue with these samples.

Sampling

Michael Emery placed out four (4) residential samplers (large Petri dishes w/ carbon tape) on 7/10/2012. They were left out for 7 days. The list of sampled addresses is included below. A windowsill sample was also collected at 20 Jackson St. In addition to the residential samples, eleven (11) source samples were collected at Hillcrest Industries and submitted. The list of sampled sources is included below. All samples were submitted to the air pollution microscopy lab at the same time.

Source Samples:

- A – new sand for sandblasting
- B – dust from sandblasting baghouse
- C – slag from pile outside
- D – slag product 30-60 micron media
- E – dust from grit dryer baghouse
- F – dust from grit grinder baghouse
- G – dust from clear glass grinder baghouse
- H – crushed glass 30-50 micron glass feed to bead furnace
- I – crushed clear glass 70 micron glass feed to bead furnace
- J – fines from glass bead furnace #1 cyclone
- K - reflective glass beads product from 30-50 micron glass

Residential Samples:

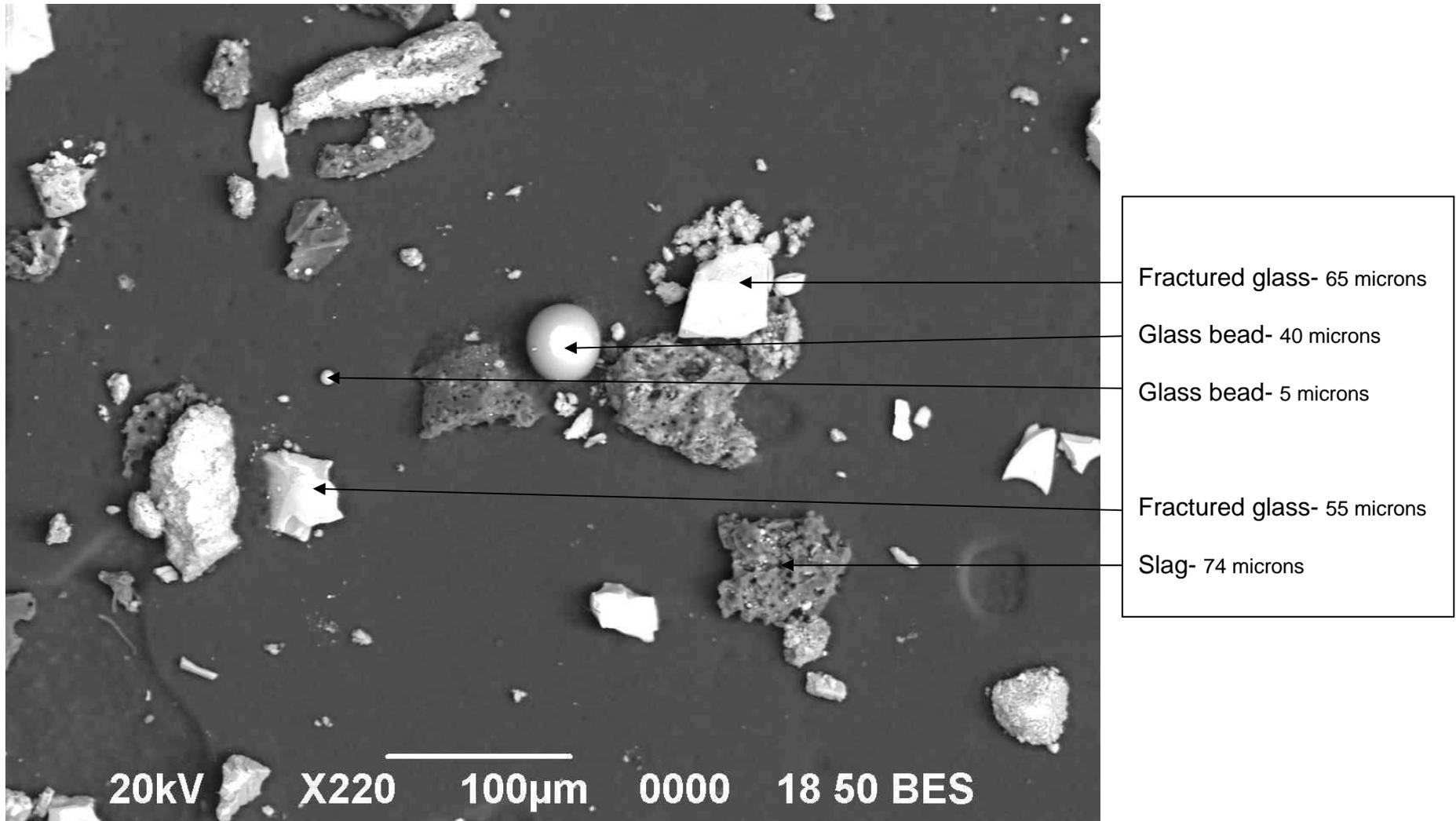
- Sample #1 – 92 Georges Dr
- Sample #2 – 20 Jackson St
- Windowsill – 20 Jackson St
- Sample #3 – 9 South Pearl St
- Sample #4 – 27 Favor St

Analysis

The samples were analyzed by both optical and scanning electron microscopy. Photomicrographs of the samples were collected and are included in this report. The samples were compared to reference materials found in the McCrone "Particle Atlas," to in house reference standards, and to sources samples collected by the Region. Particle sizing was performed on all residential samples. Attribution of source particulate to residential samples was based on the morphology of the samples.

RESULTS

Below is a typical example of the dust found on all 4 residences. Representative photomicrographs of each sample site are included in the following pages. Some images are taken with the electron microscope and some with the stereomicroscope. Electron microscopic images were taken with either the Backscatter Detector (BES) or the Secondary Electron Detector (SEI). Particle size of the dust found at the 4 residences was consistent with the source material acquired from Hillcrest Industries. In the image below, fractured glass, glass beads, and slag material are noted. These materials were found at all 4 residential sites.

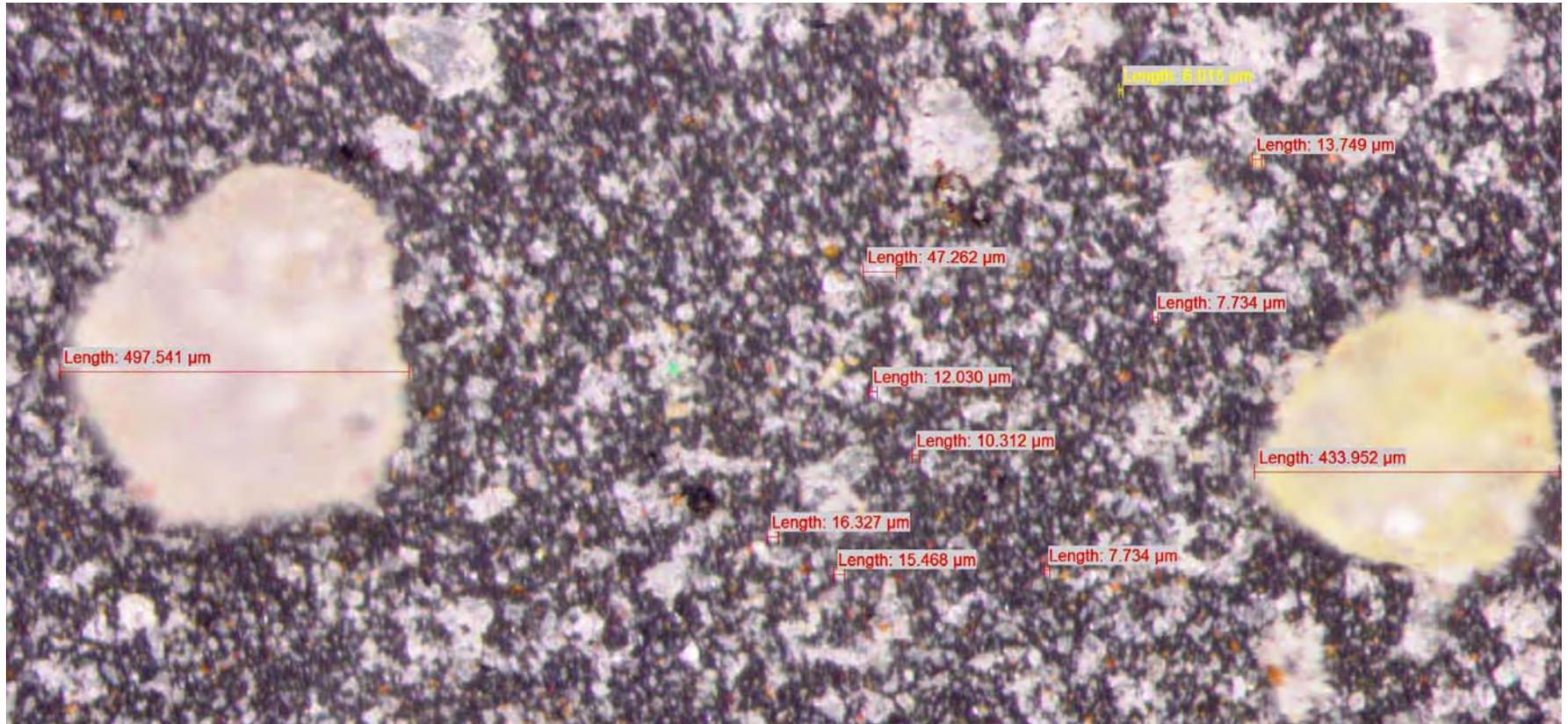


Source Samples

A –new sand for sandblasting - 12.5 X Stereo Microscope Image



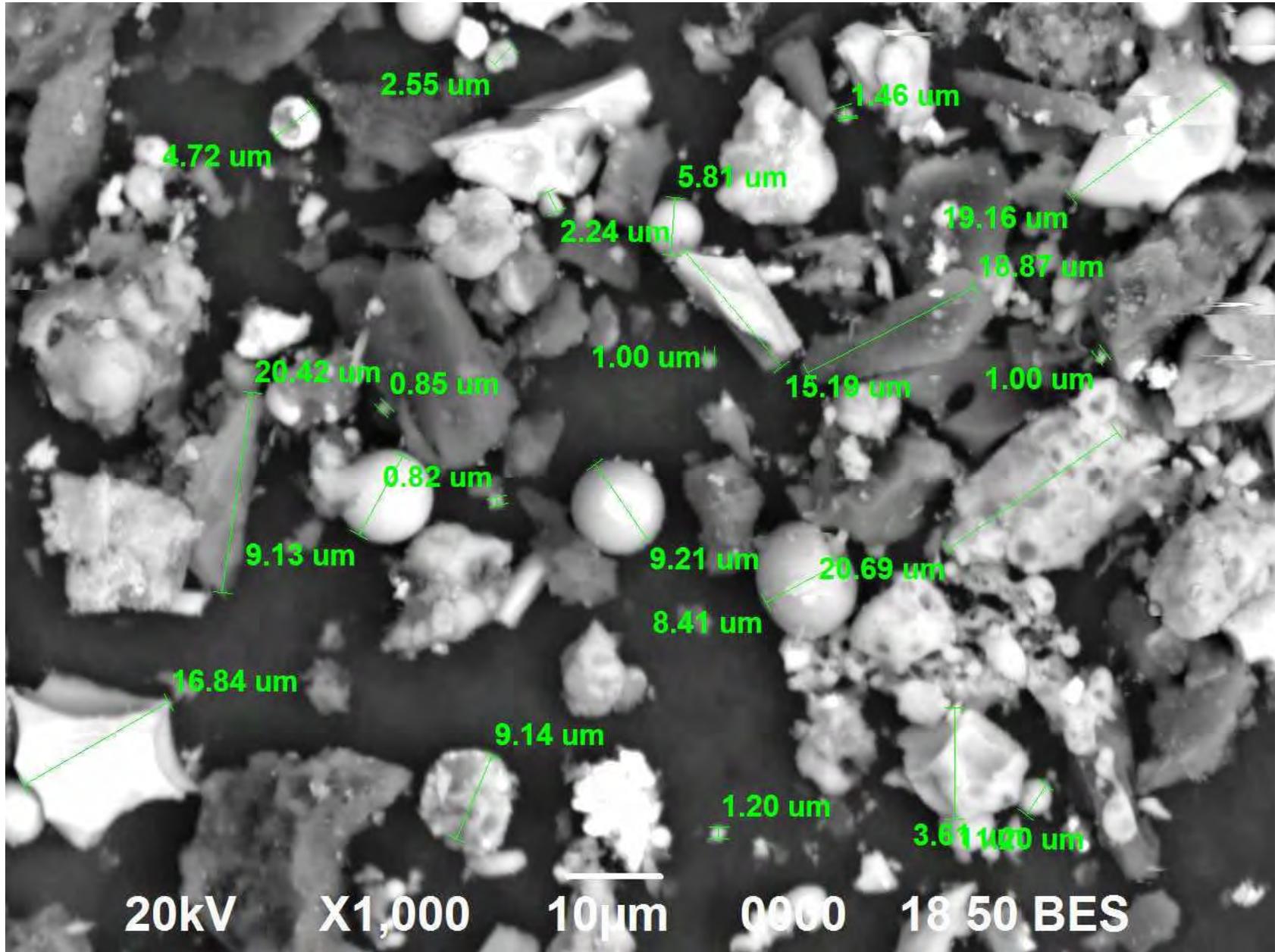
B – dust from sandblasting baghouse - 90x Stereo Microscope Image



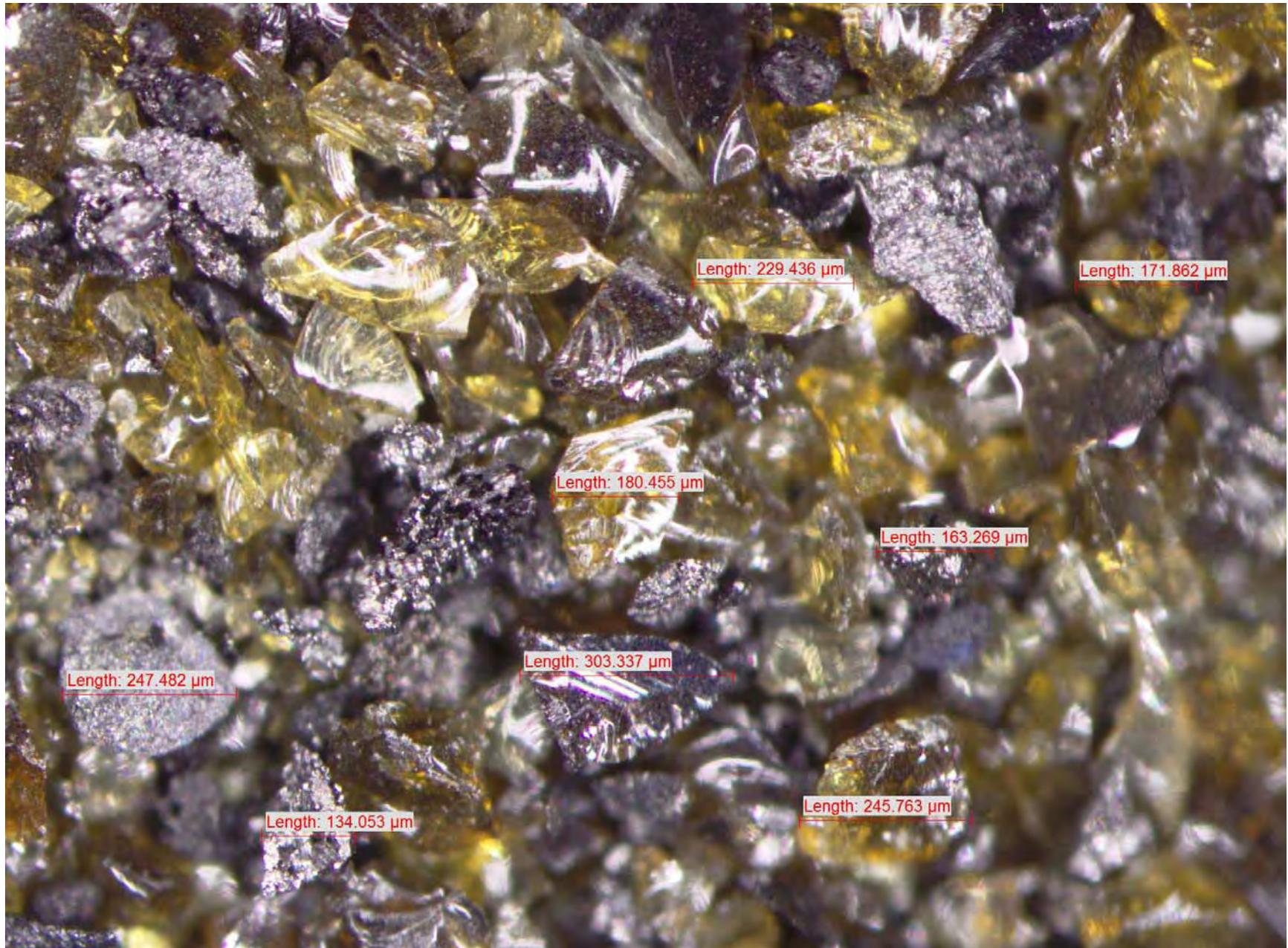
C – slag from pile outside - 7X Stereo Microscope Image



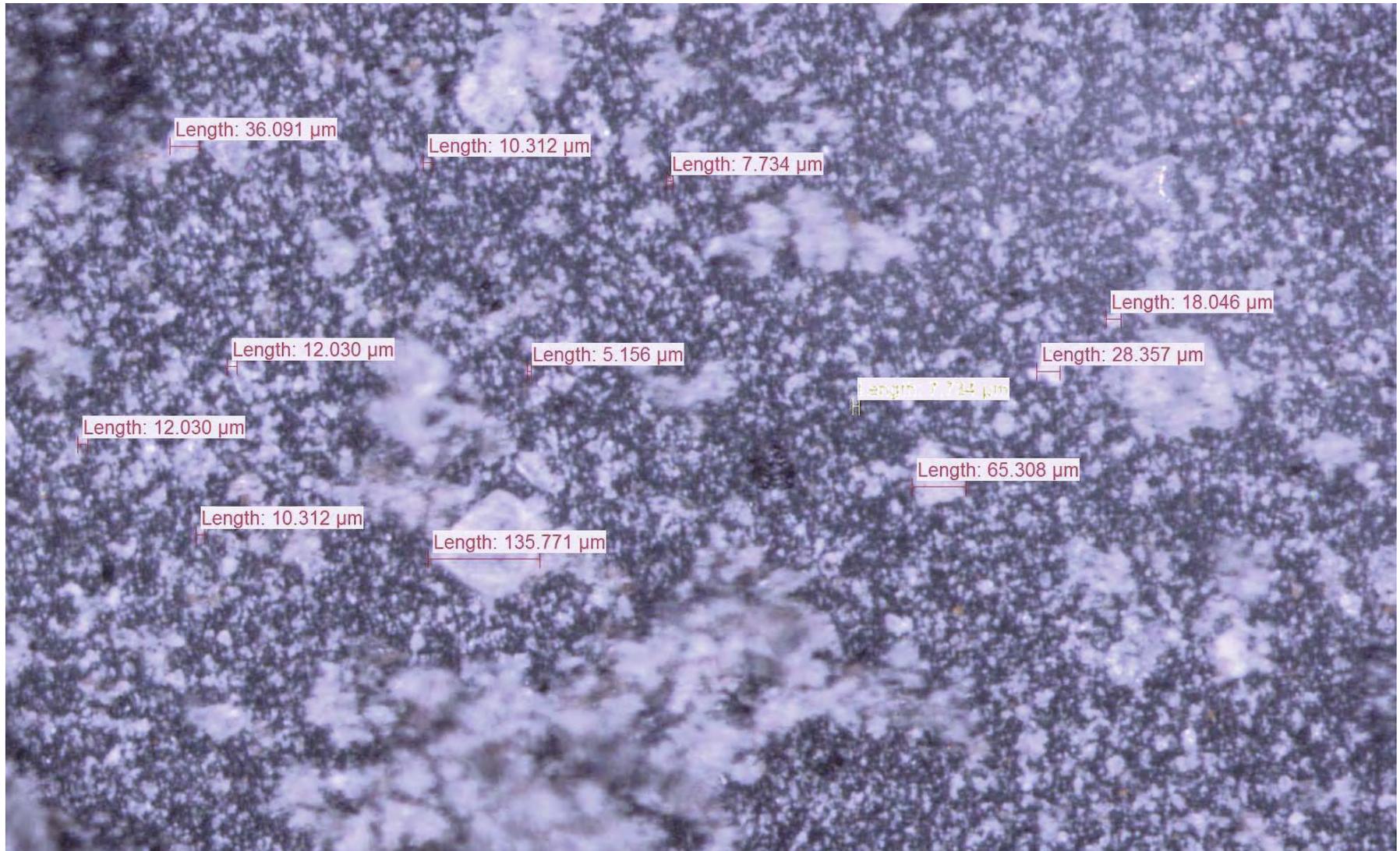
C (Cont.) – slag from pile outside – 1000x SEM Backscattered image



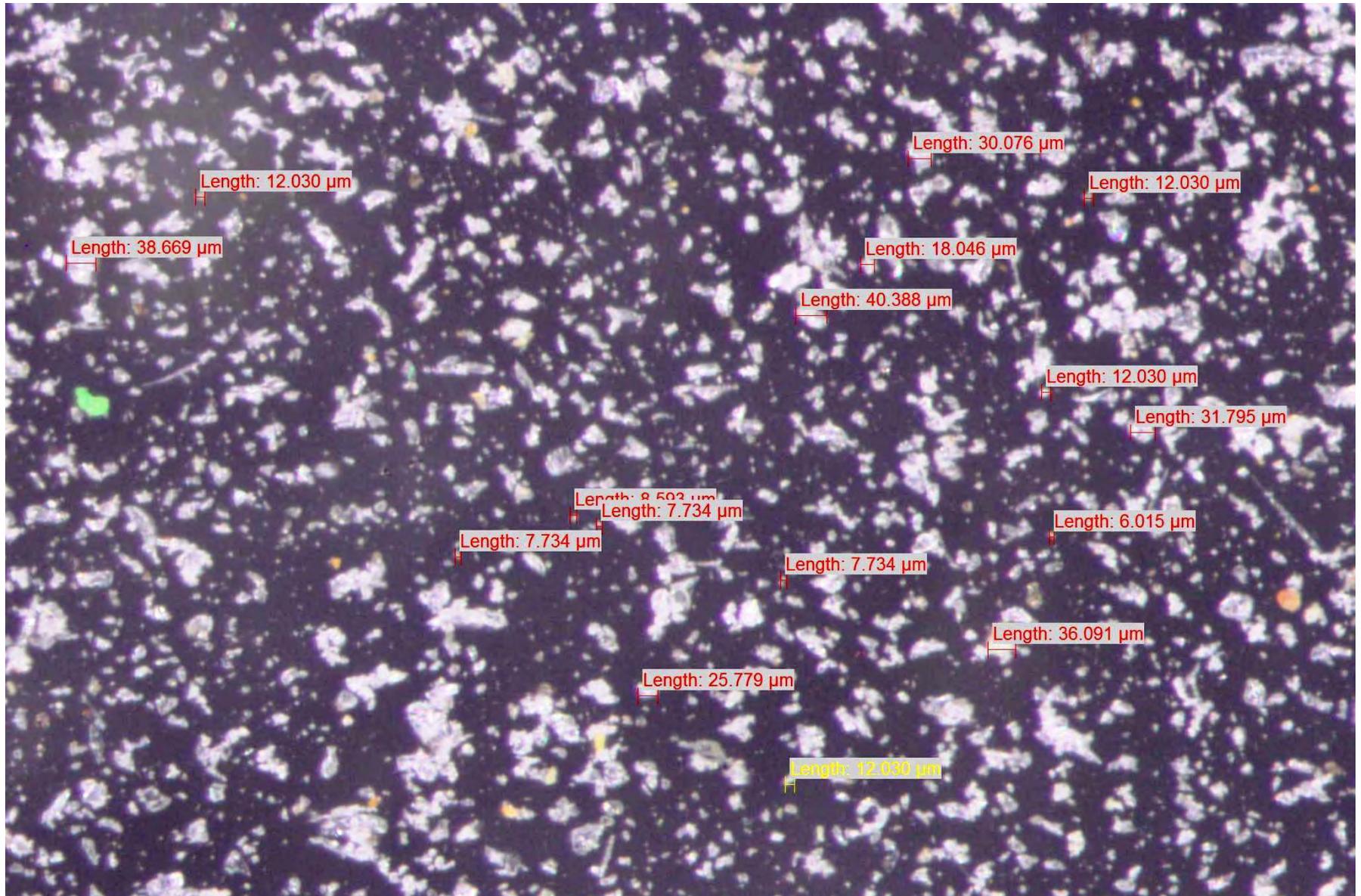
D – slag product 30-60 micron media = 32X Stereo Microscope Image



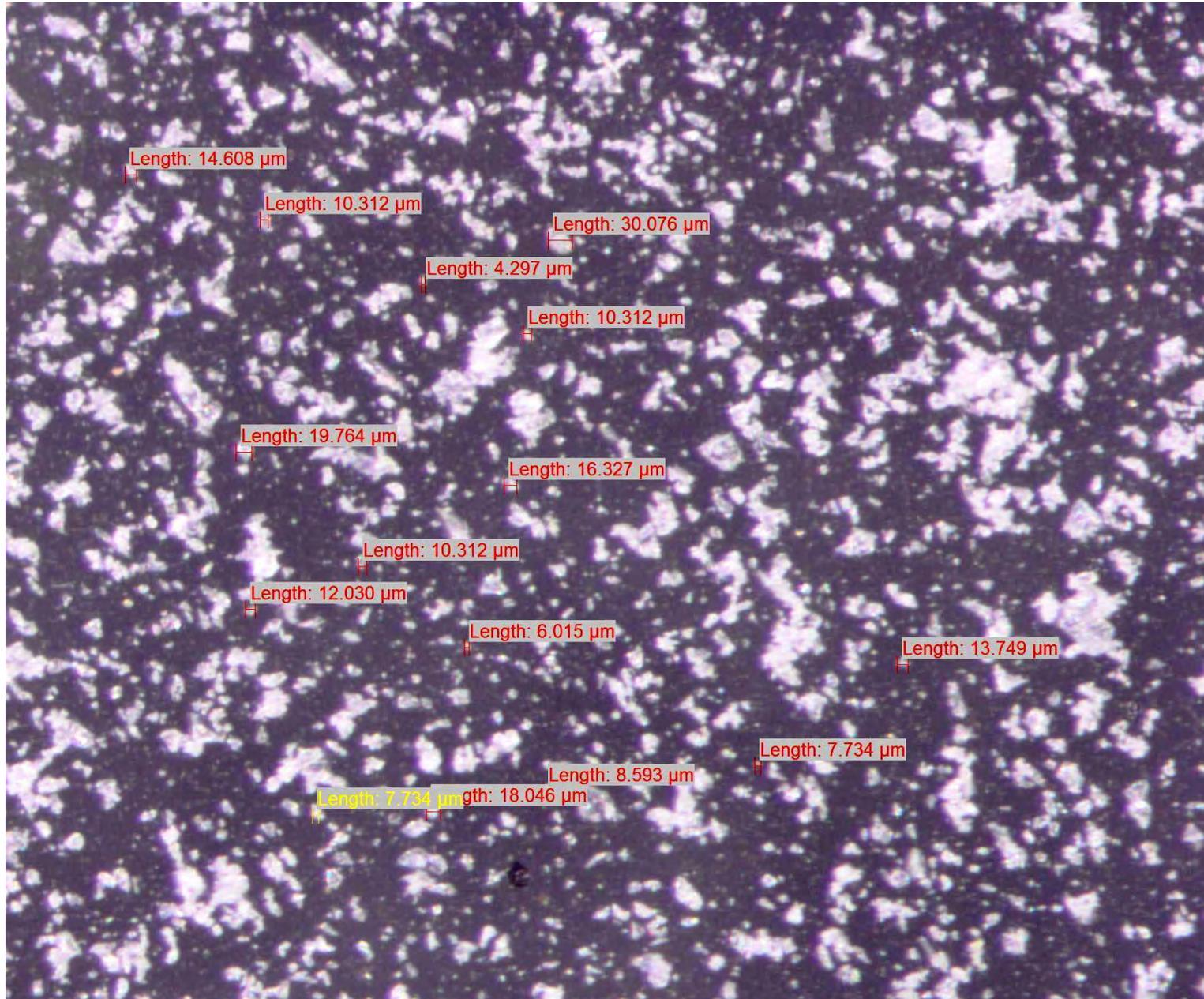
E – dust from grit dryer baghouse - 90X Stereo Microscope Image



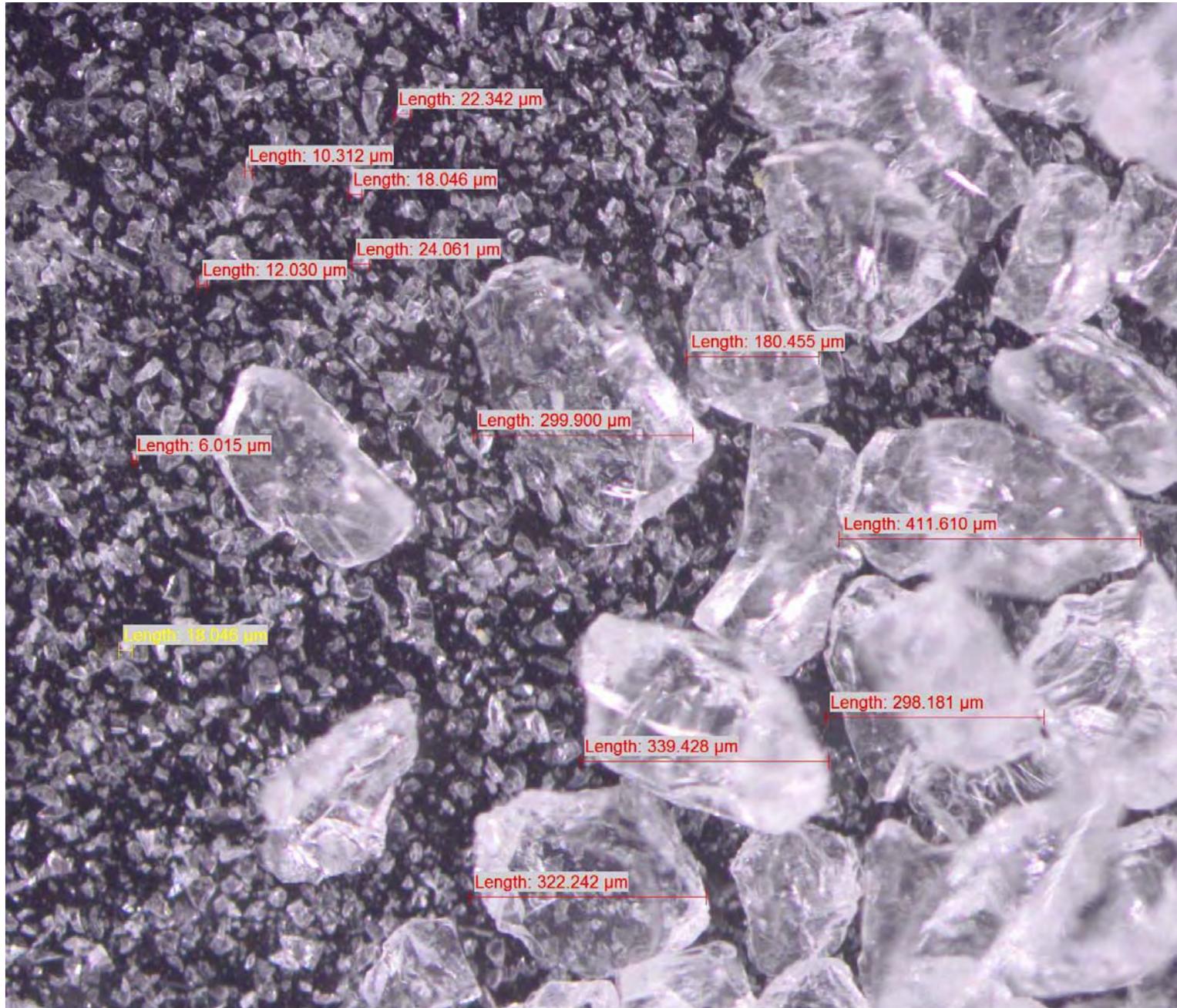
F – dust from grit grinder baghouse - 90X Stereo Microscope Image



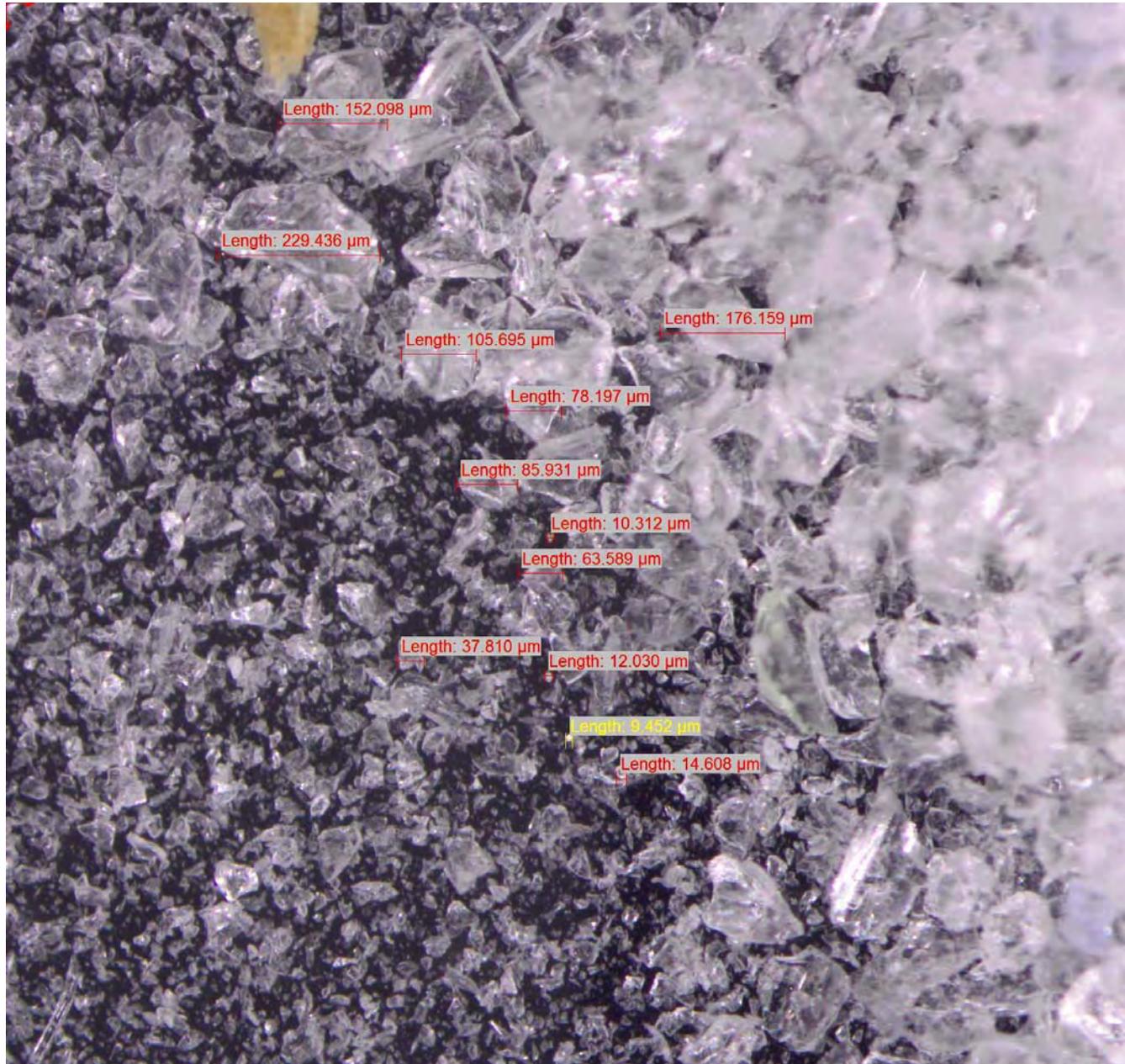
G – dust from clear glass grinder baghouse - 90X Stereo Microscope Image



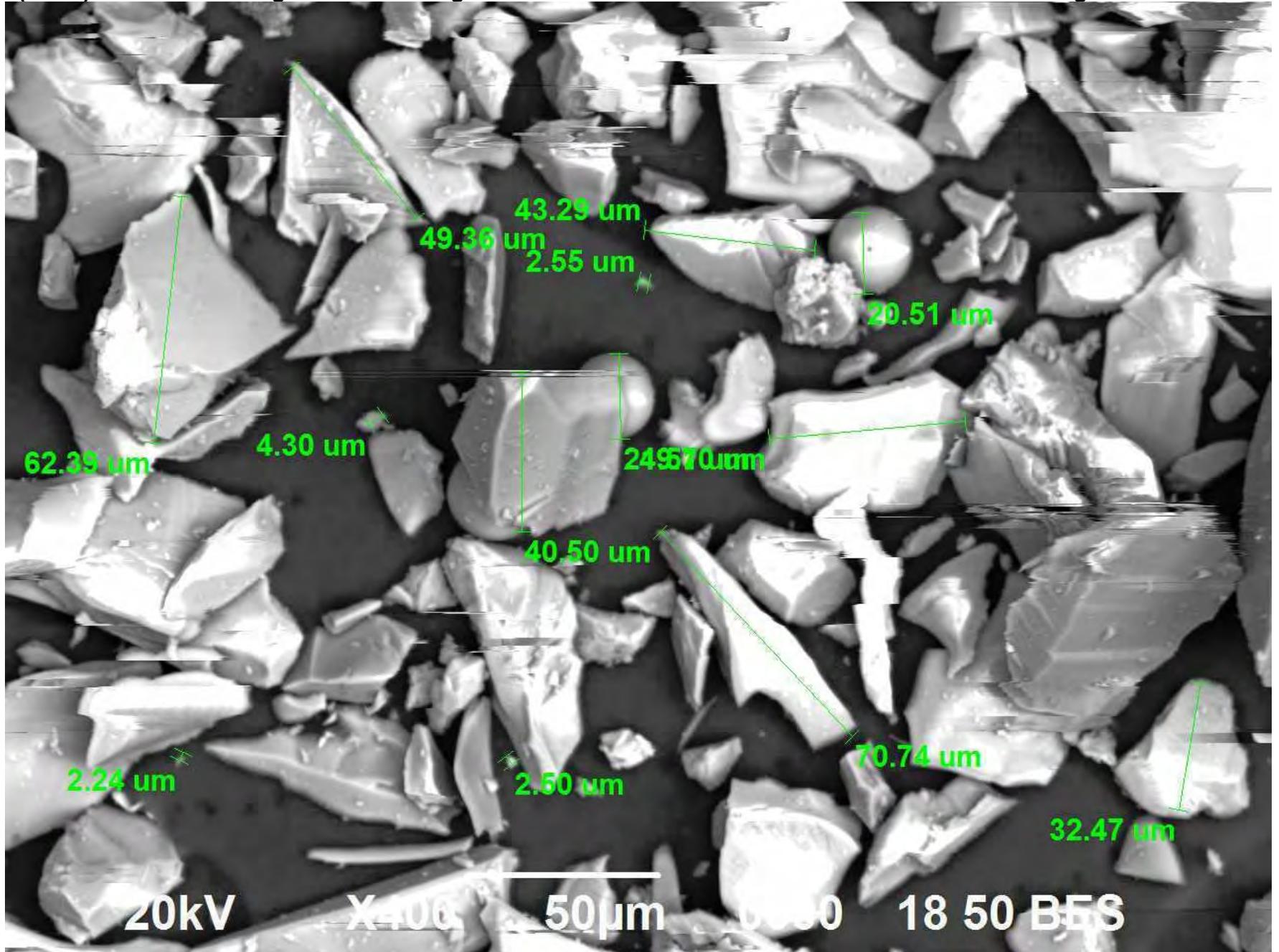
H – crushed glass 30-50 micron glass feed to bead furnace - 32X Stereo Microscope Image



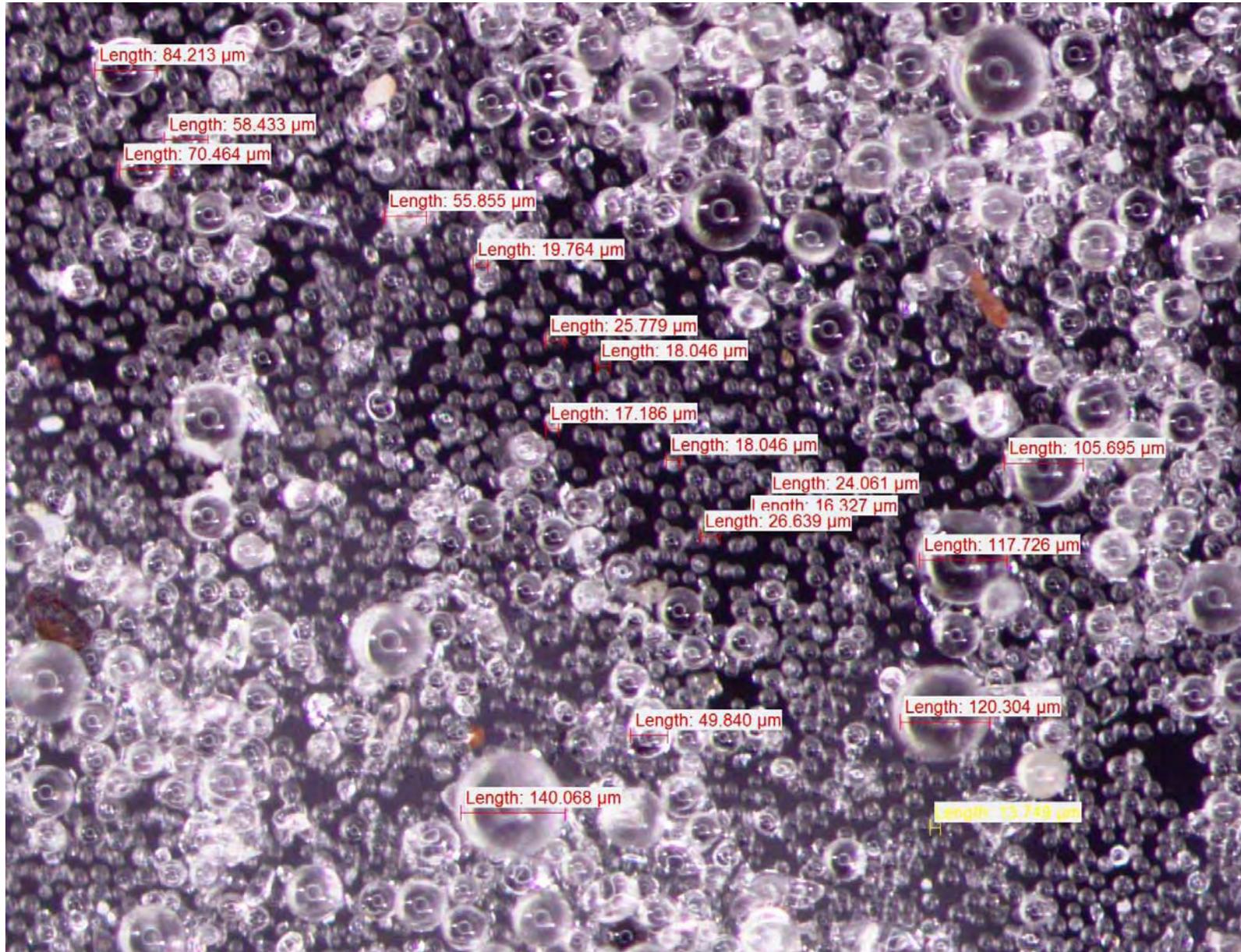
I – crushed clear glass 70 micron glass feed to bead furnace - X Stereo Microscope Image



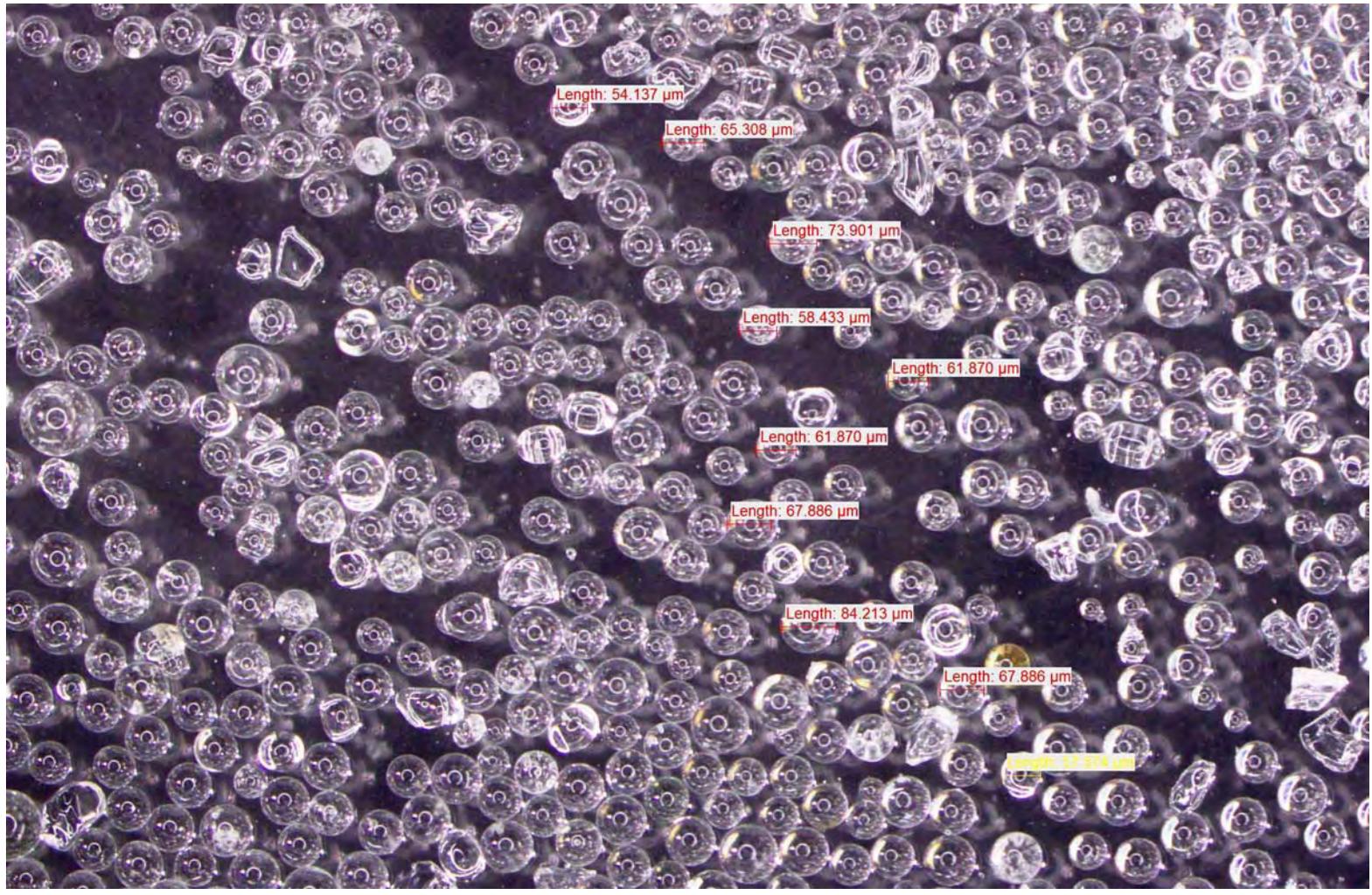
I (Cont.) – crushed clear glass 70 micron glass feed to bead furnace - 400x SEM Backscattered image



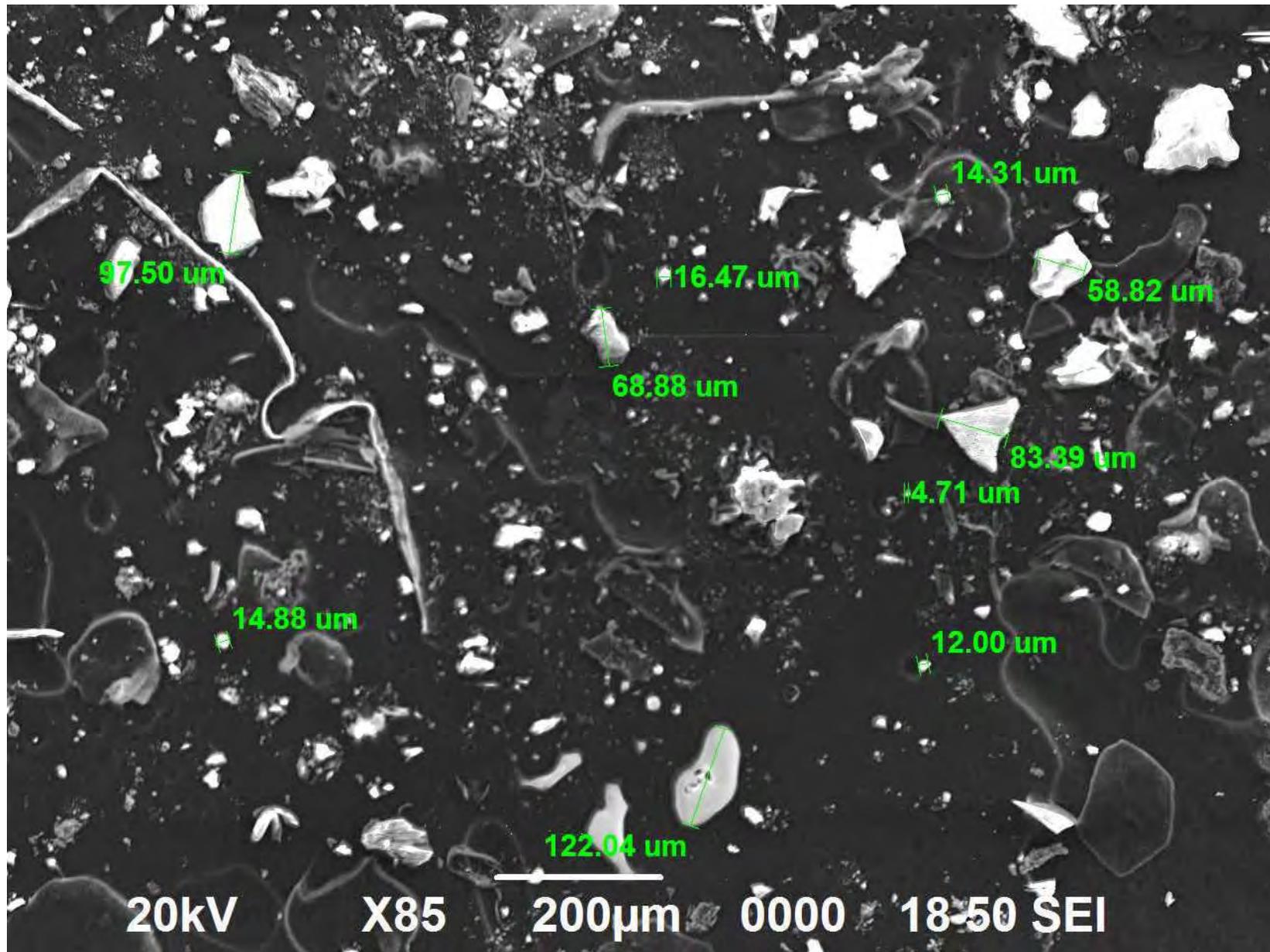
J – fines from glass bead furnace #1 cyclone - 63X Stereo Microscope Image



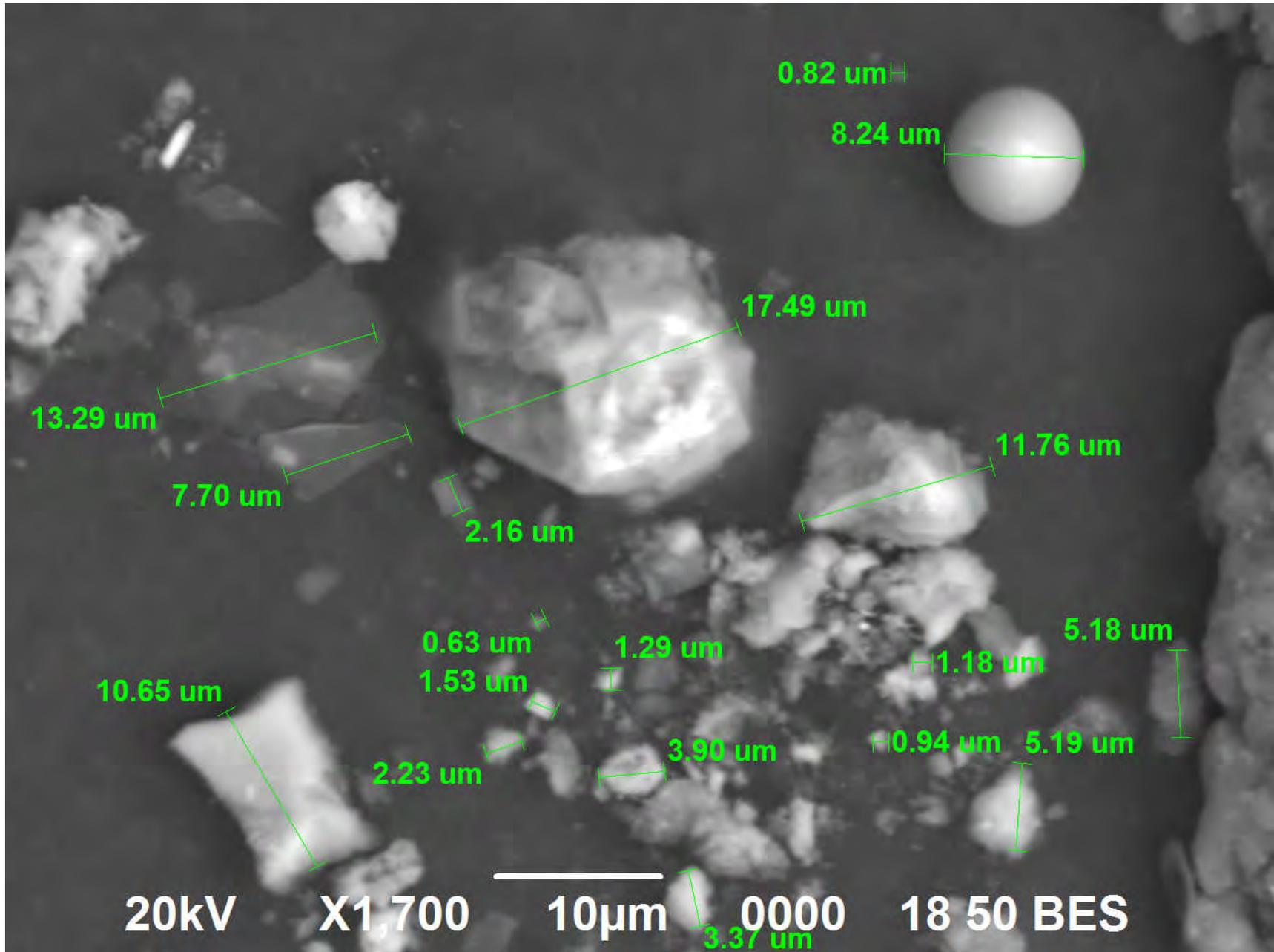
K - reflective glass beads product from 30-50 micron glass - 12X Stereo Microscope Image



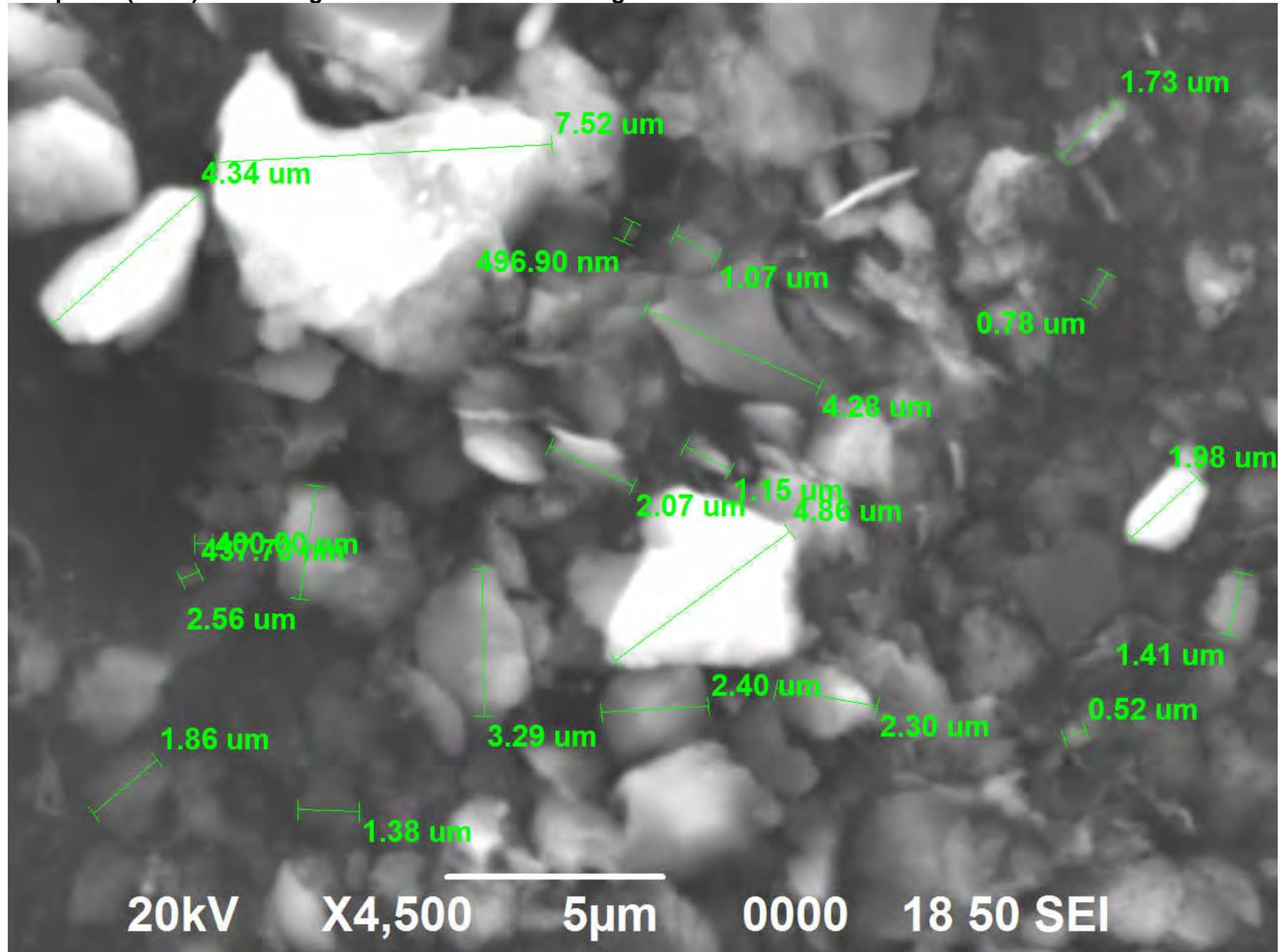
Residential Samples:
Sample #1 – 92 Georges Dr - 85X SEM SEI Image



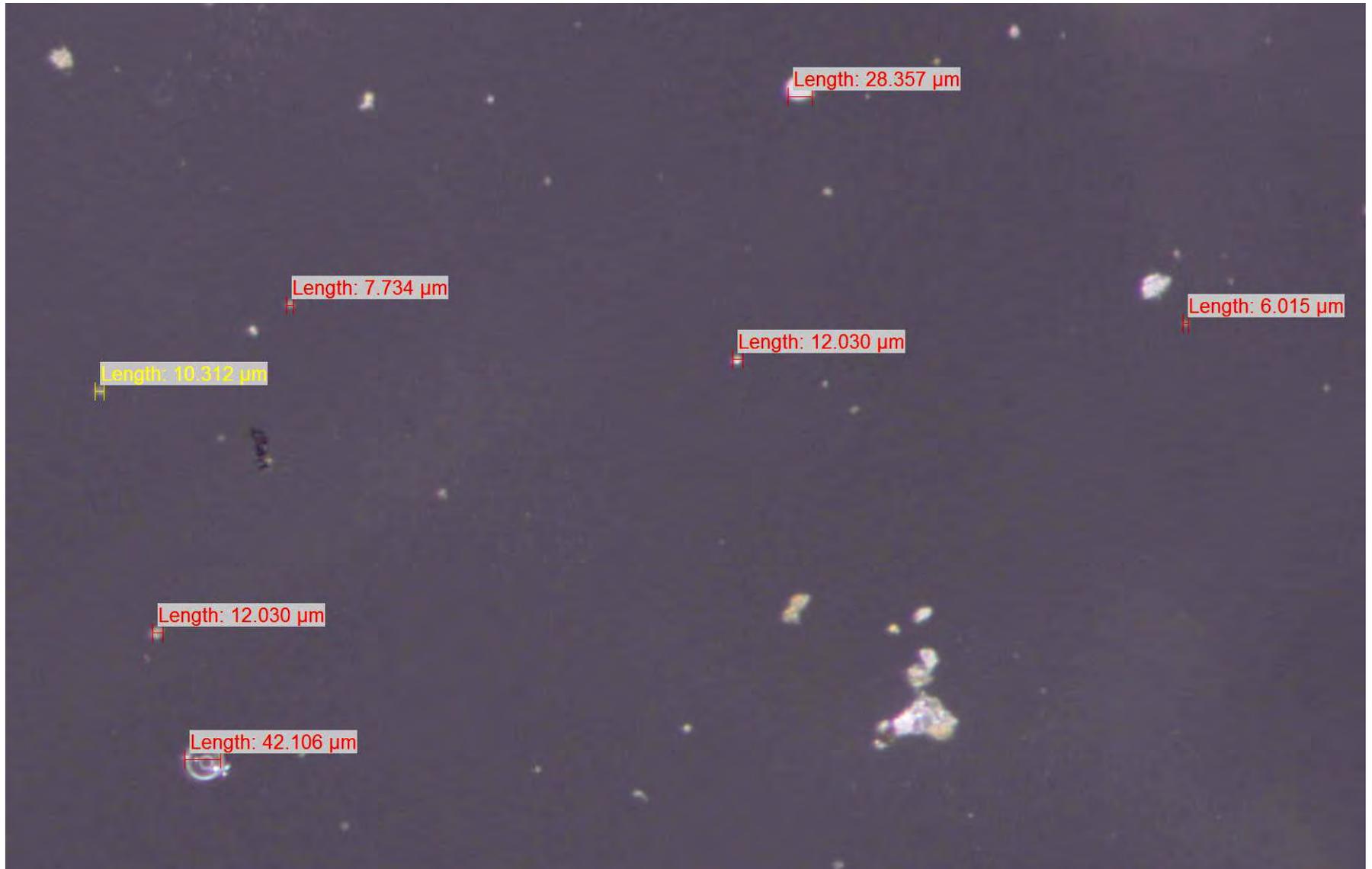
Sample #1 (Cont.)- 92 Georges Dr - 1700X SEM Backscattered Image



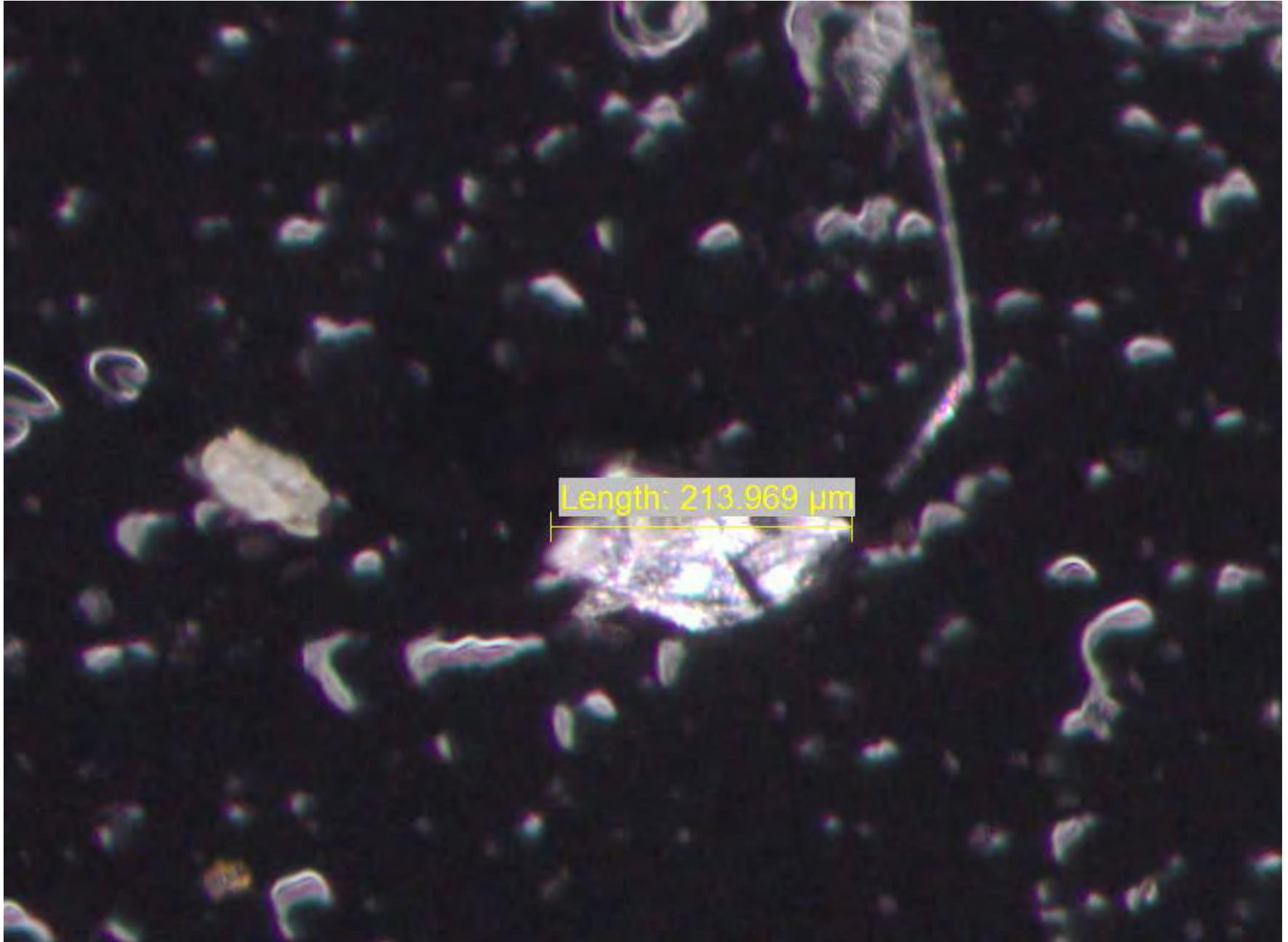
Sample #1 (Cont.)- 92 Georges Dr - 4500x SEM SEI Image



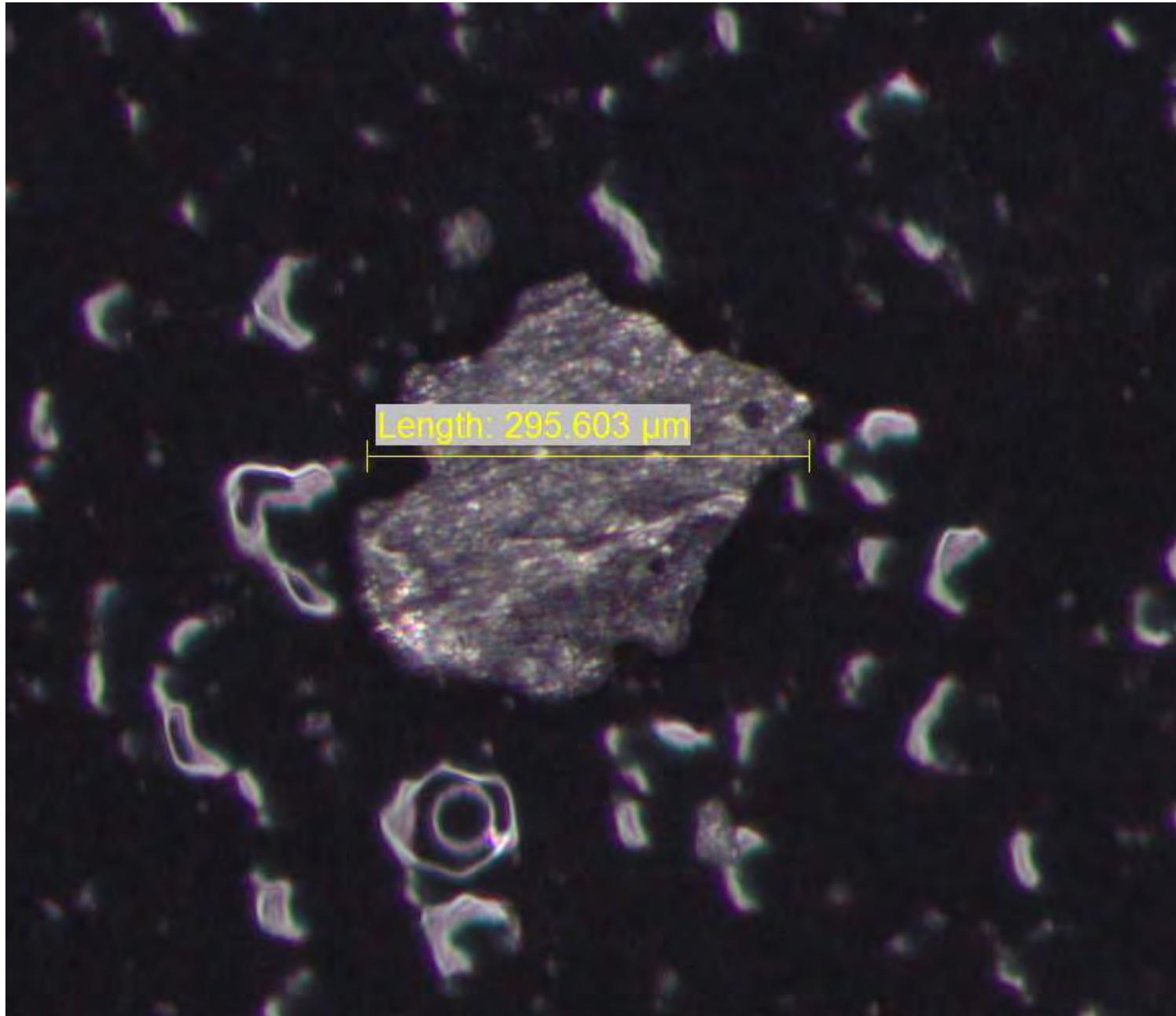
Sample #1 (Cont.)– 92 Georges Dr - 90X Stereo Microscope Image



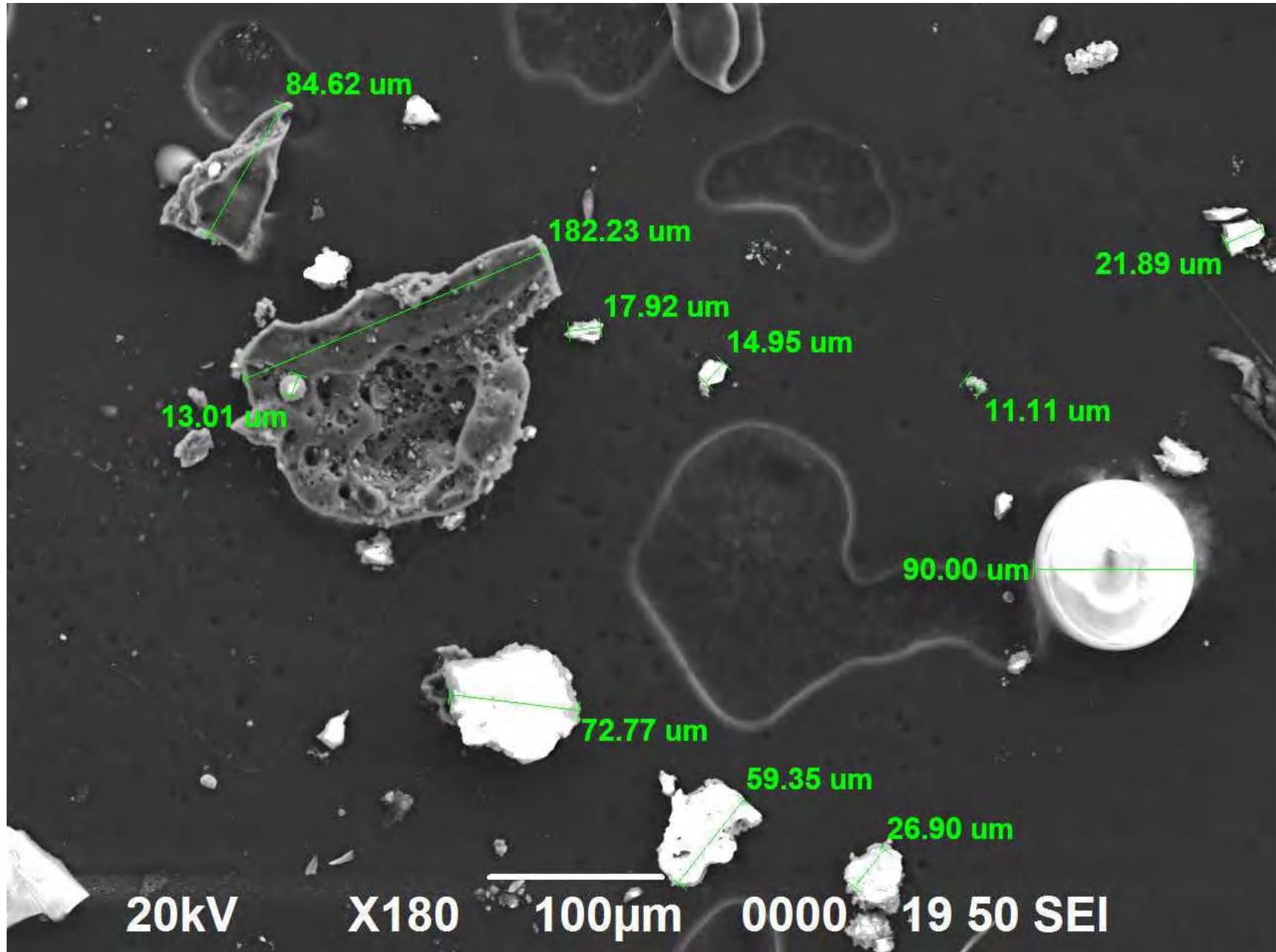
Sample #1 (Cont.)– 92 Georges Dr - 63X Stereo Microscope Image



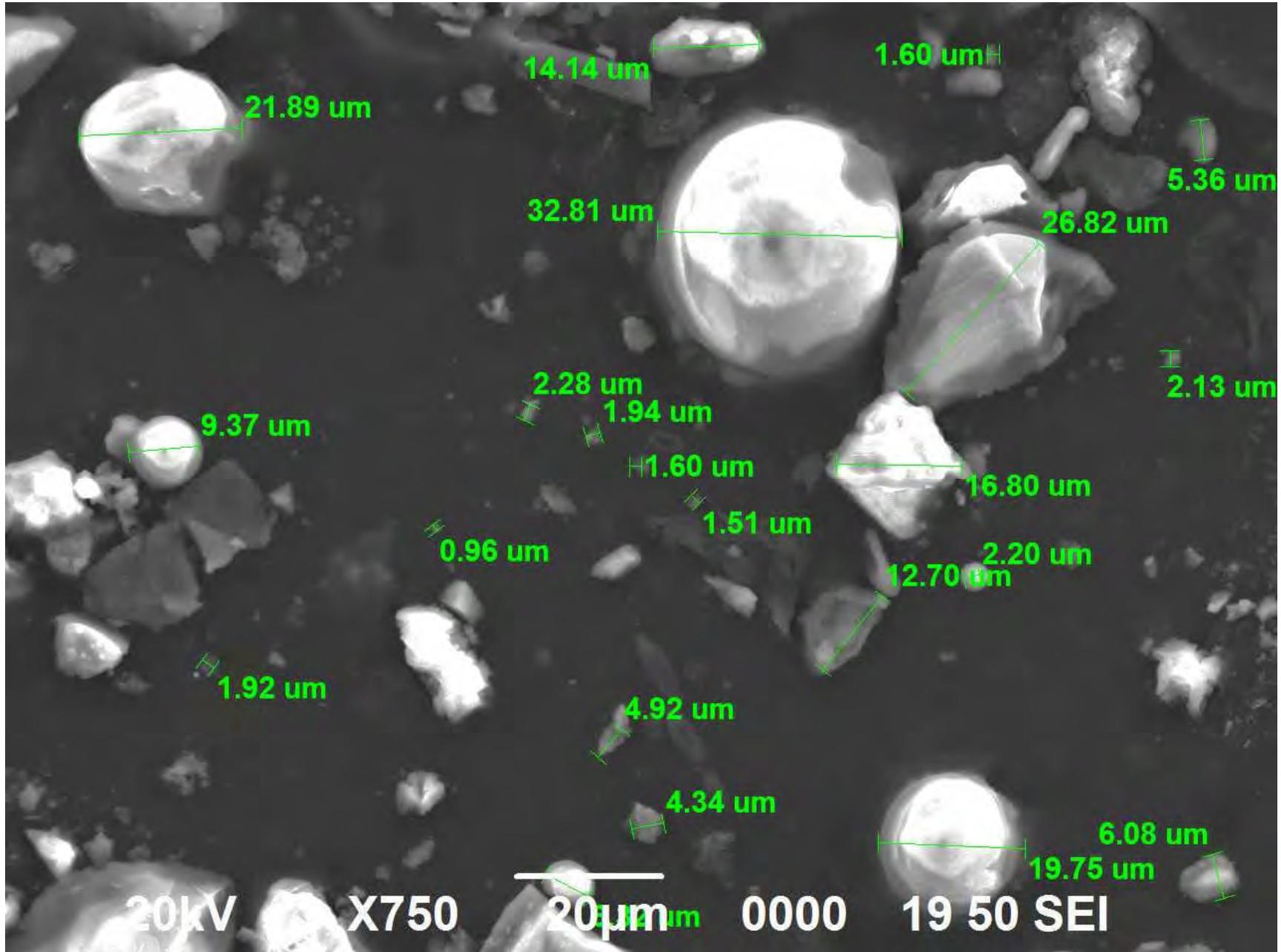
Sample #1 (Cont.)– 92 Georges Dr - 63X Stereo Microscope Image



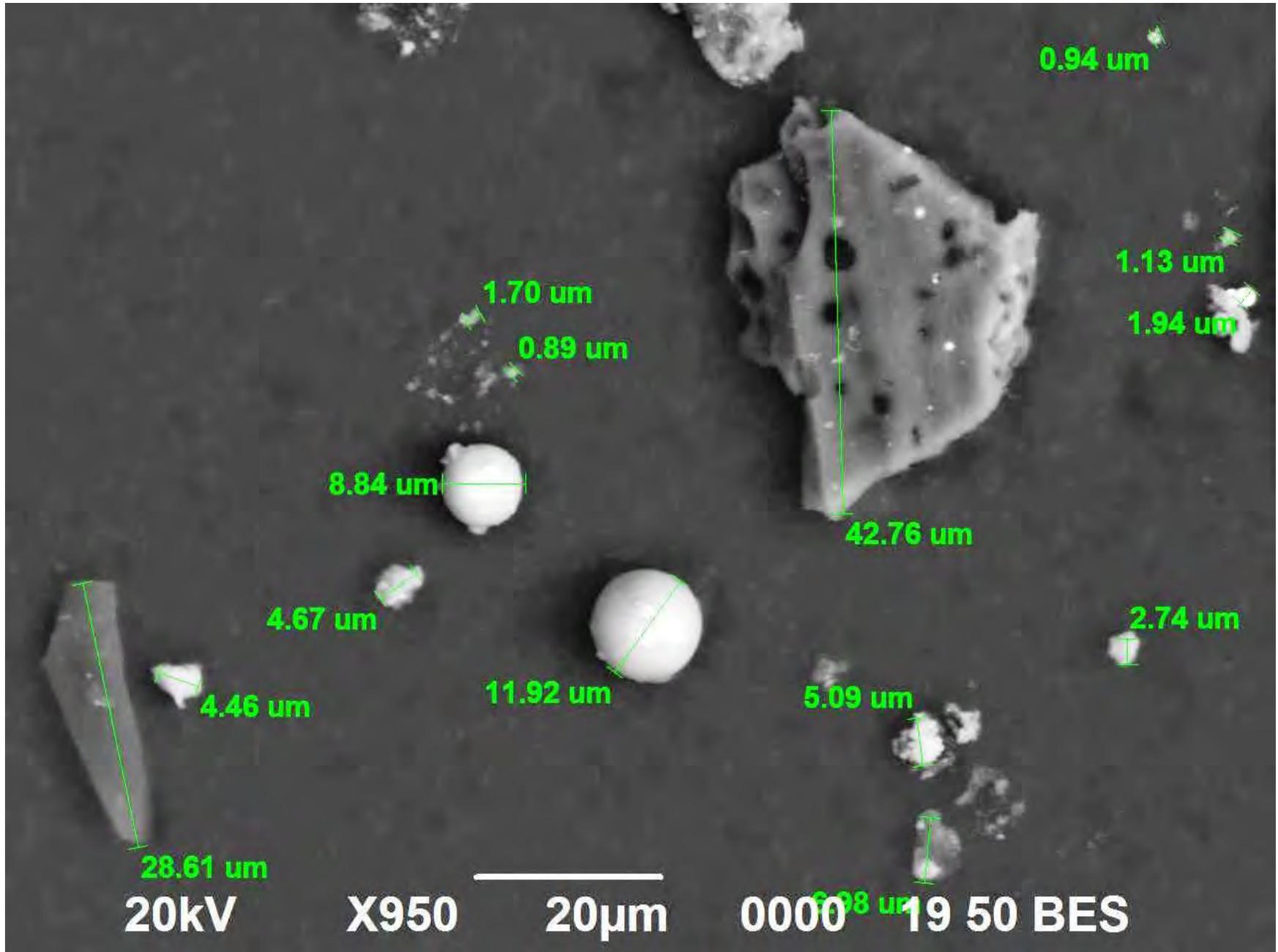
Sample #2 – 20 Jackson St - 180X SEM SEI Microscope Image



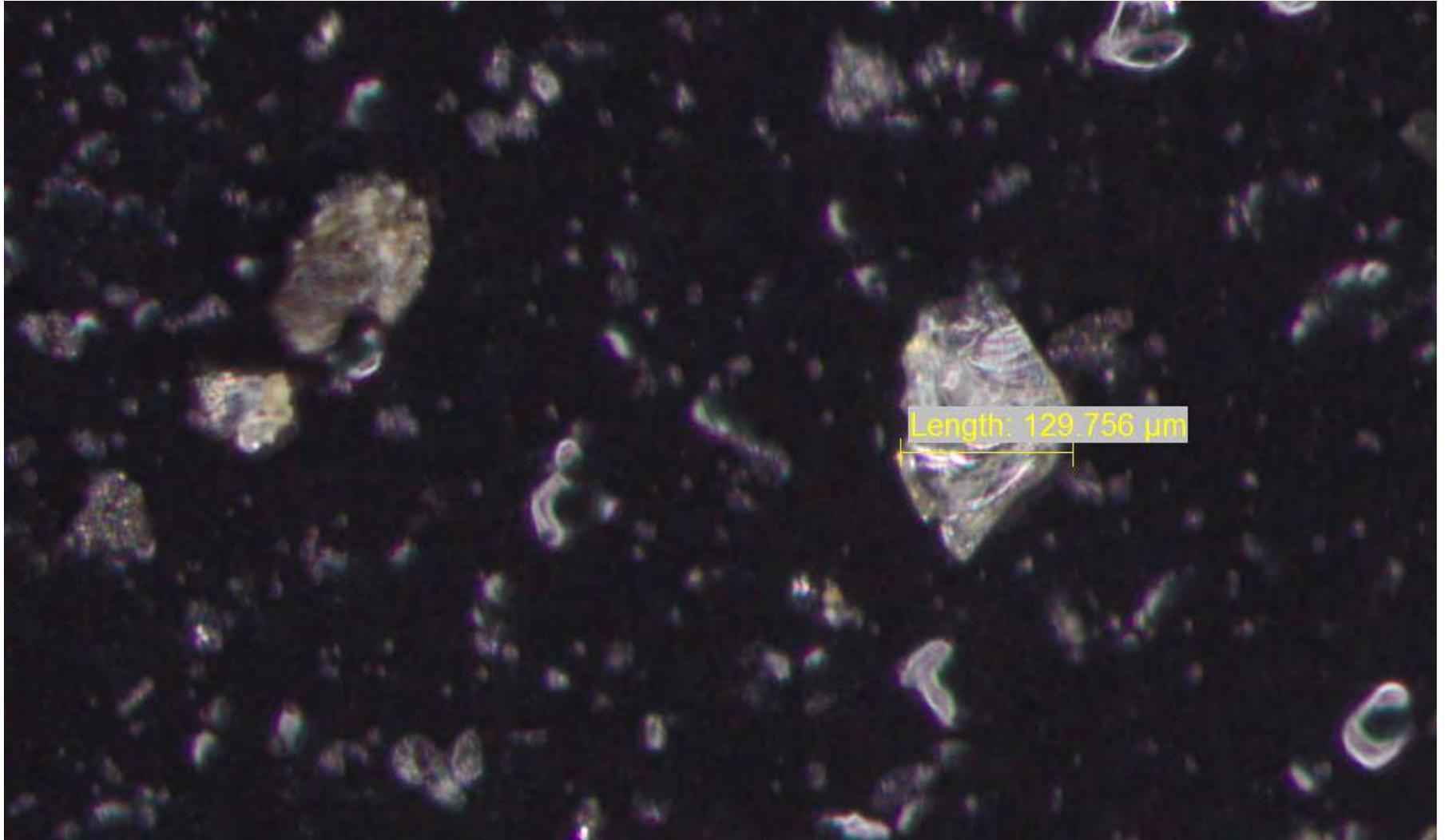
Sample #2 (Cont.)- 20 Jackson St - 750X SEM SEI Microscope Image



Sample #2 (Cont.)- 20 Jackson St - 950X SEM Backscattered Microscope Image



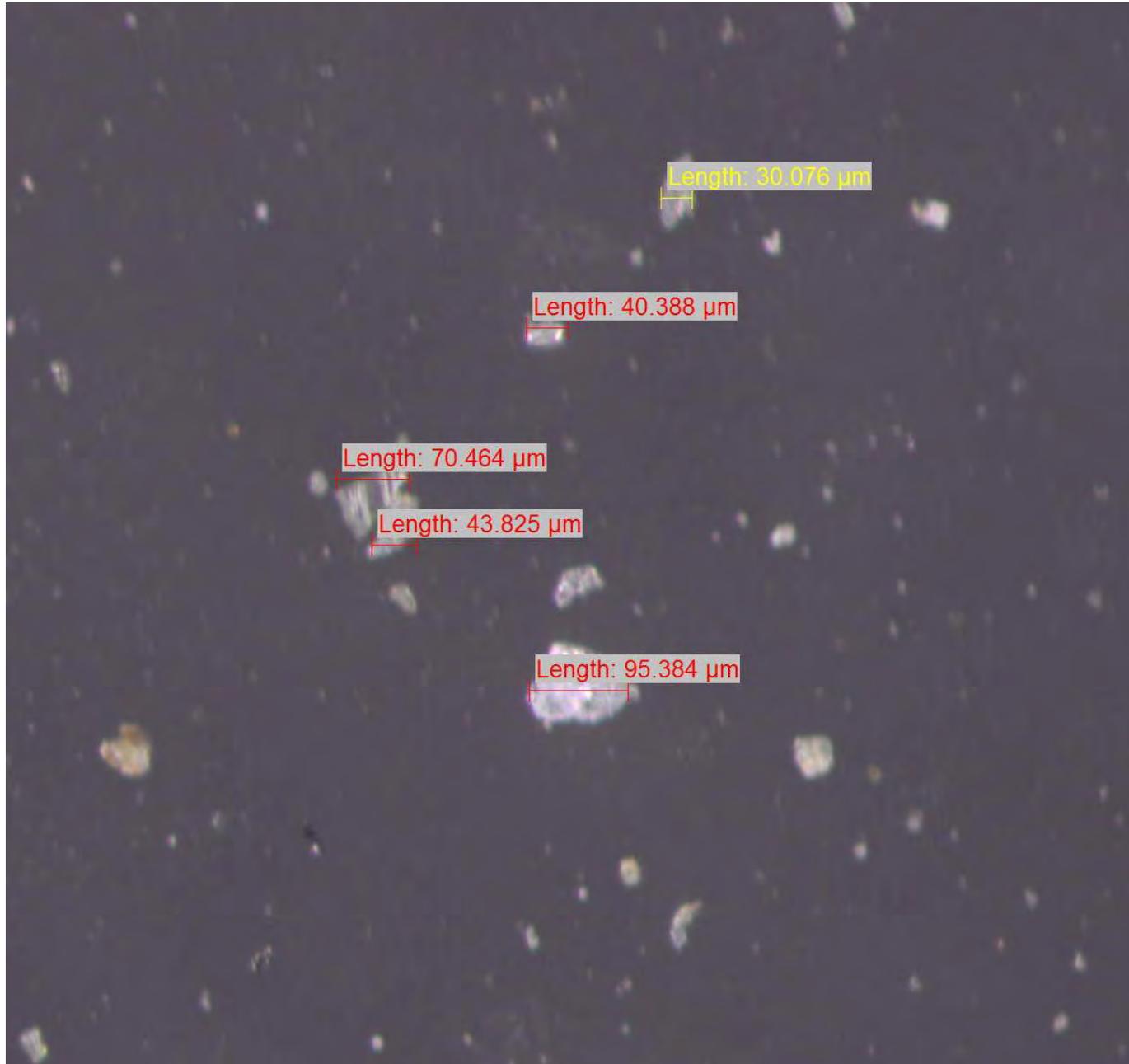
Sample #2 (Cont.)- 20 Jackson St - 63X Stereo Microscope Image



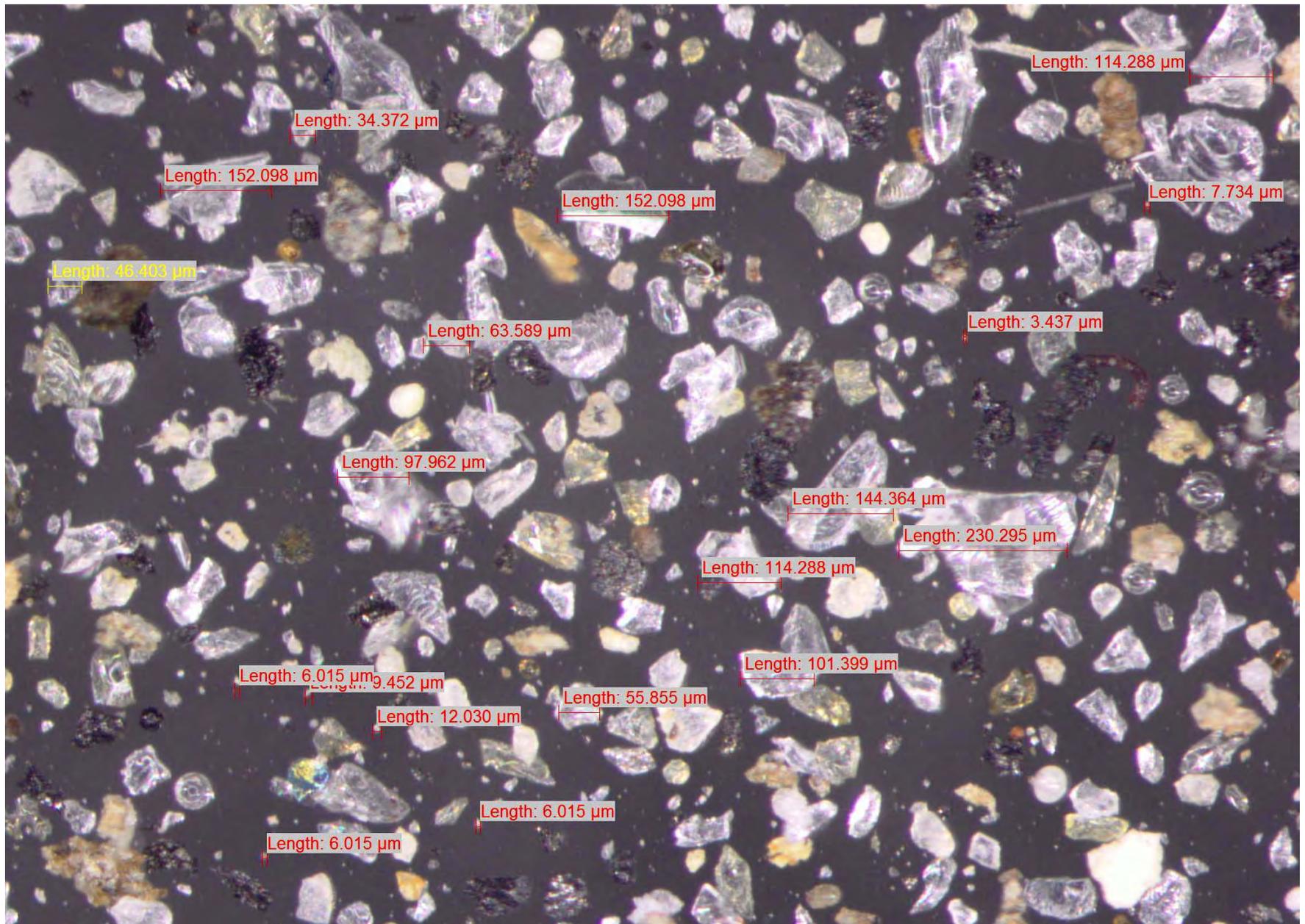
Sample #2 (Cont.)– 20 Jackson St - 63X Stereo Microscope Image



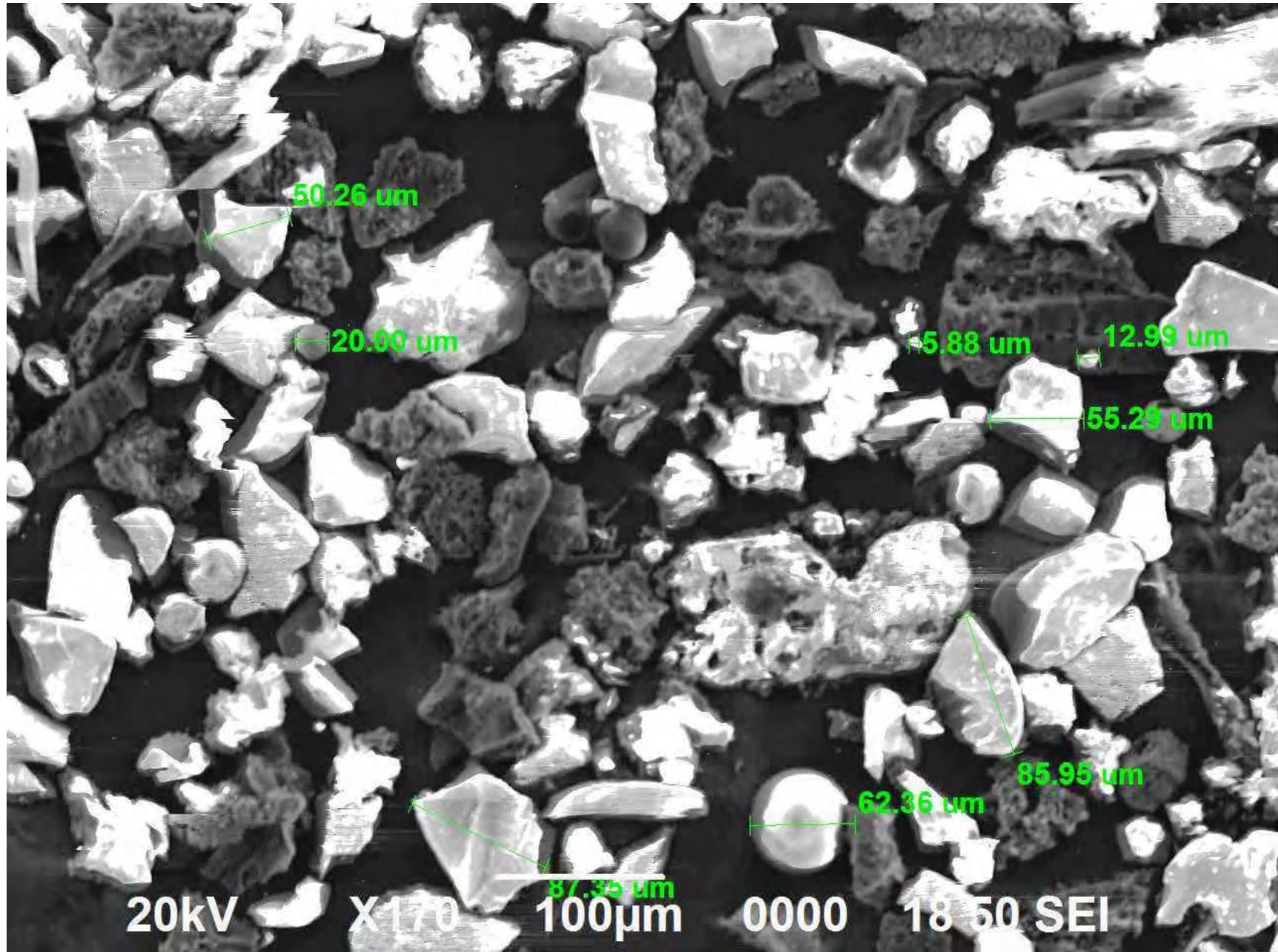
Sample #2 (Cont.)– 20 Jackson St - 63X Stereo Microscope Image



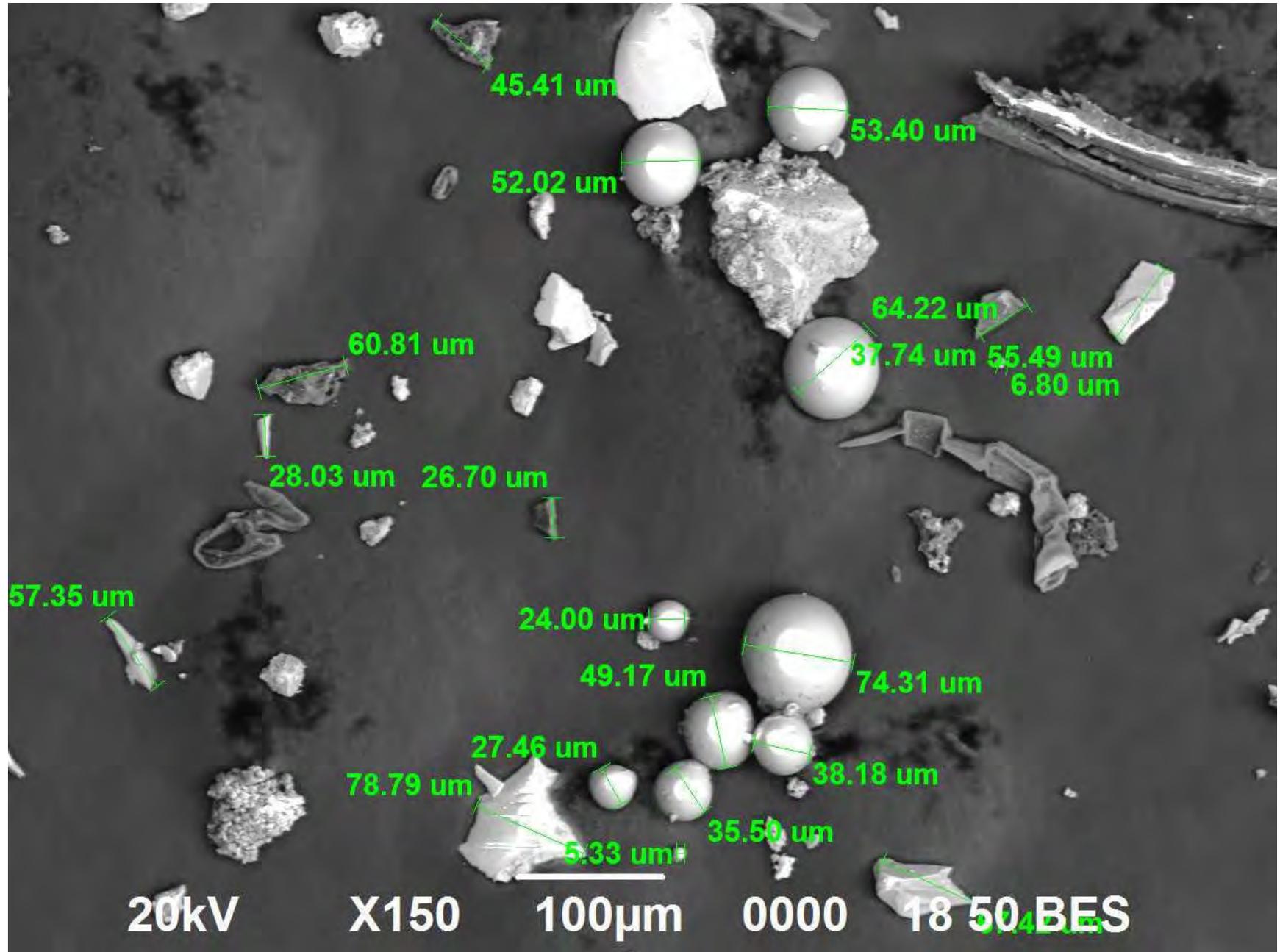
Windowsill – 20 Jackson St - 63X Stereo Microscope Image



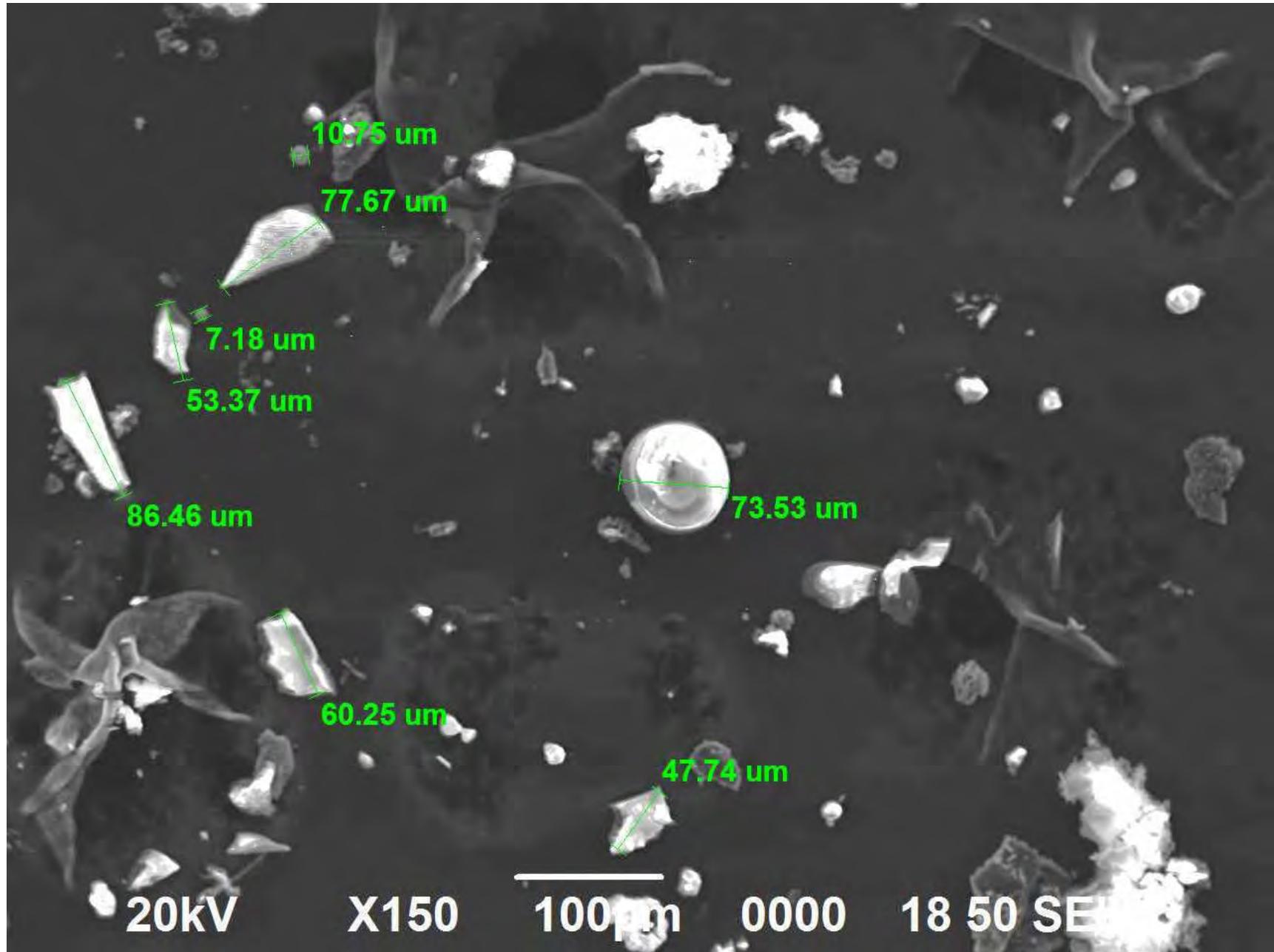
Windowsill (Cont.)– 20 Jackson St - 170X SEM SEI Microscope Image



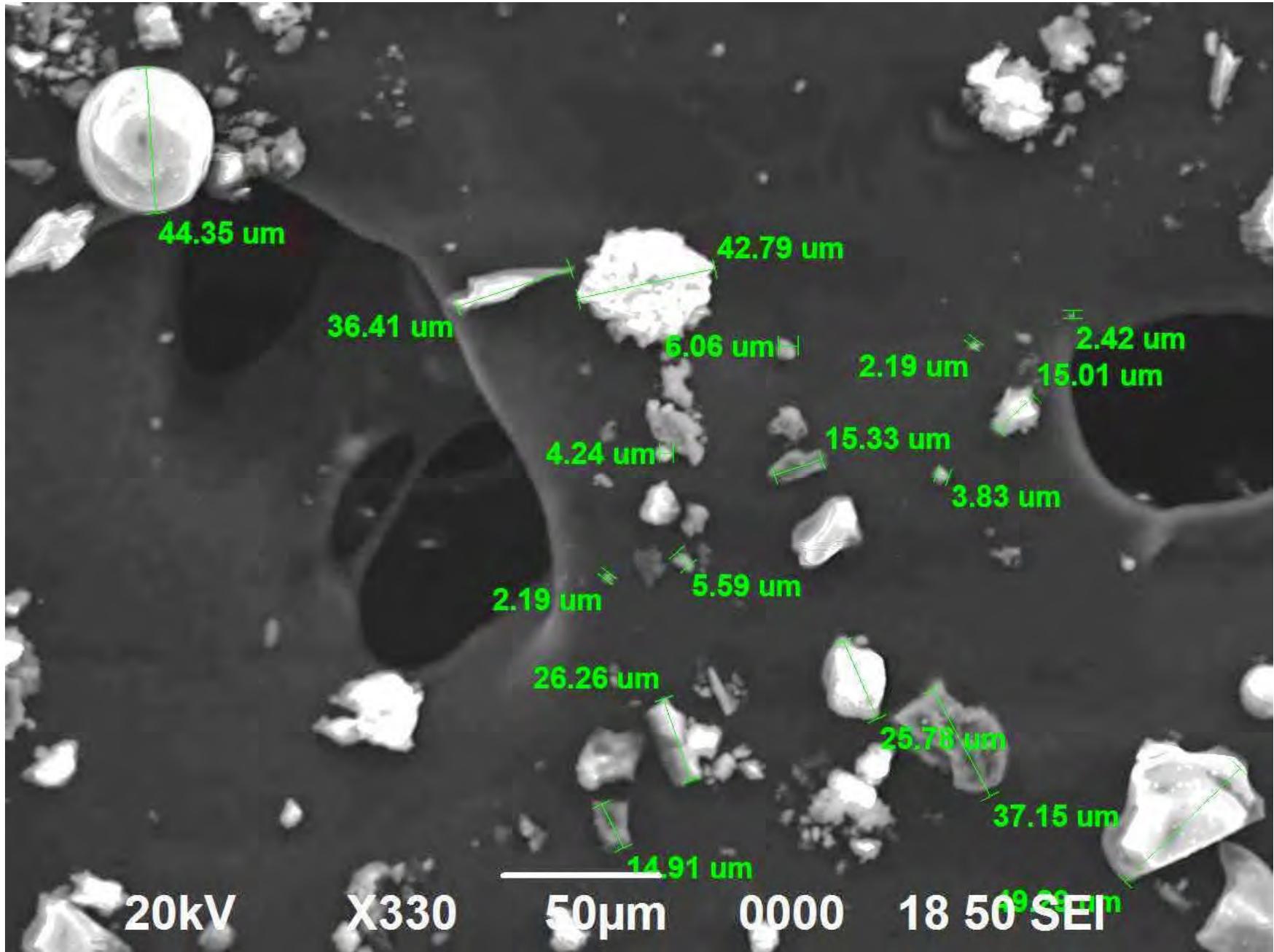
Sample #3 – 9 South Pearl St - 150X SEM Backscattered Microscope Image



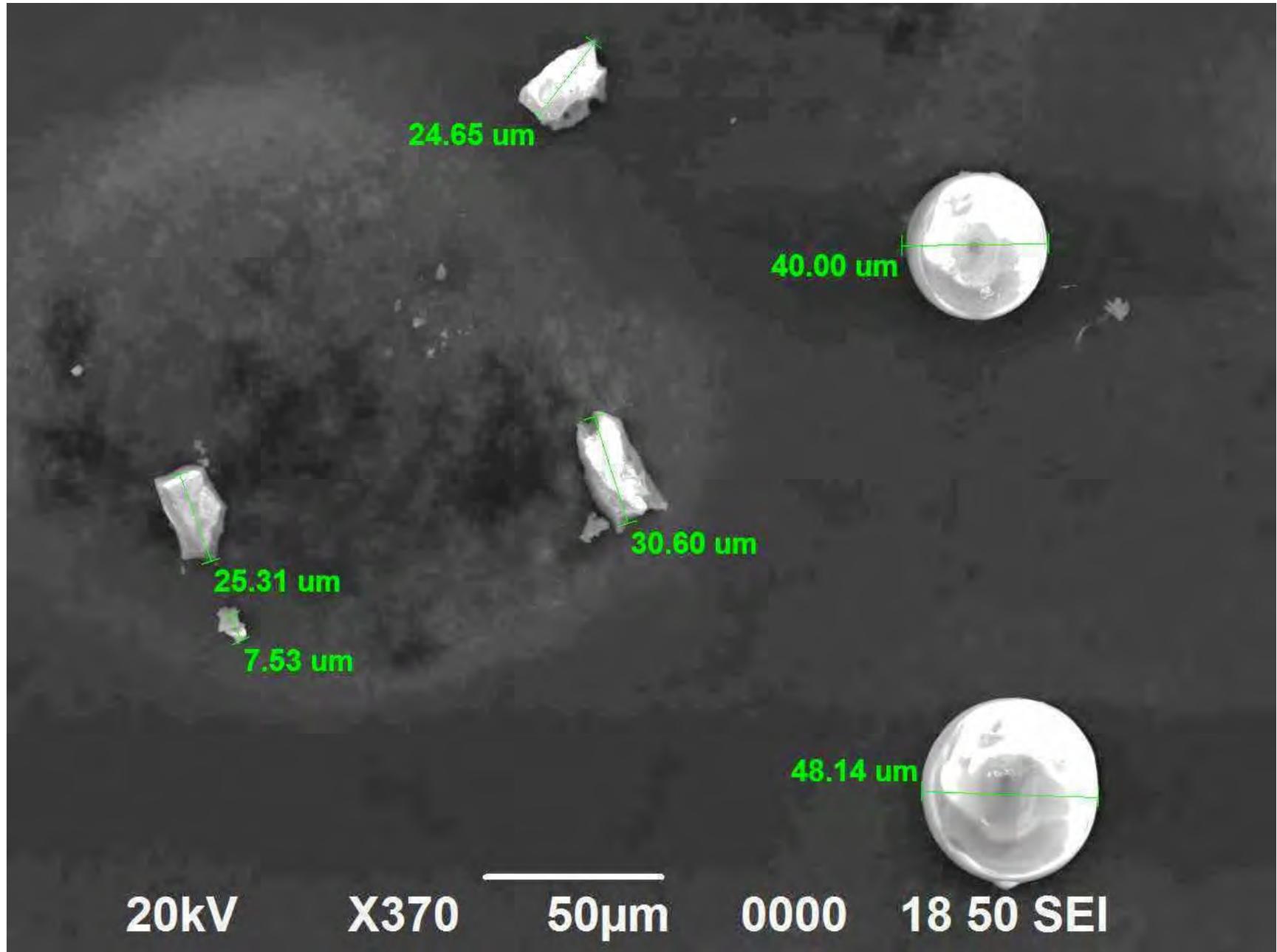
Sample #3 Cont.) – 9 South Pearl St - 150X SEM SEI Microscope Image



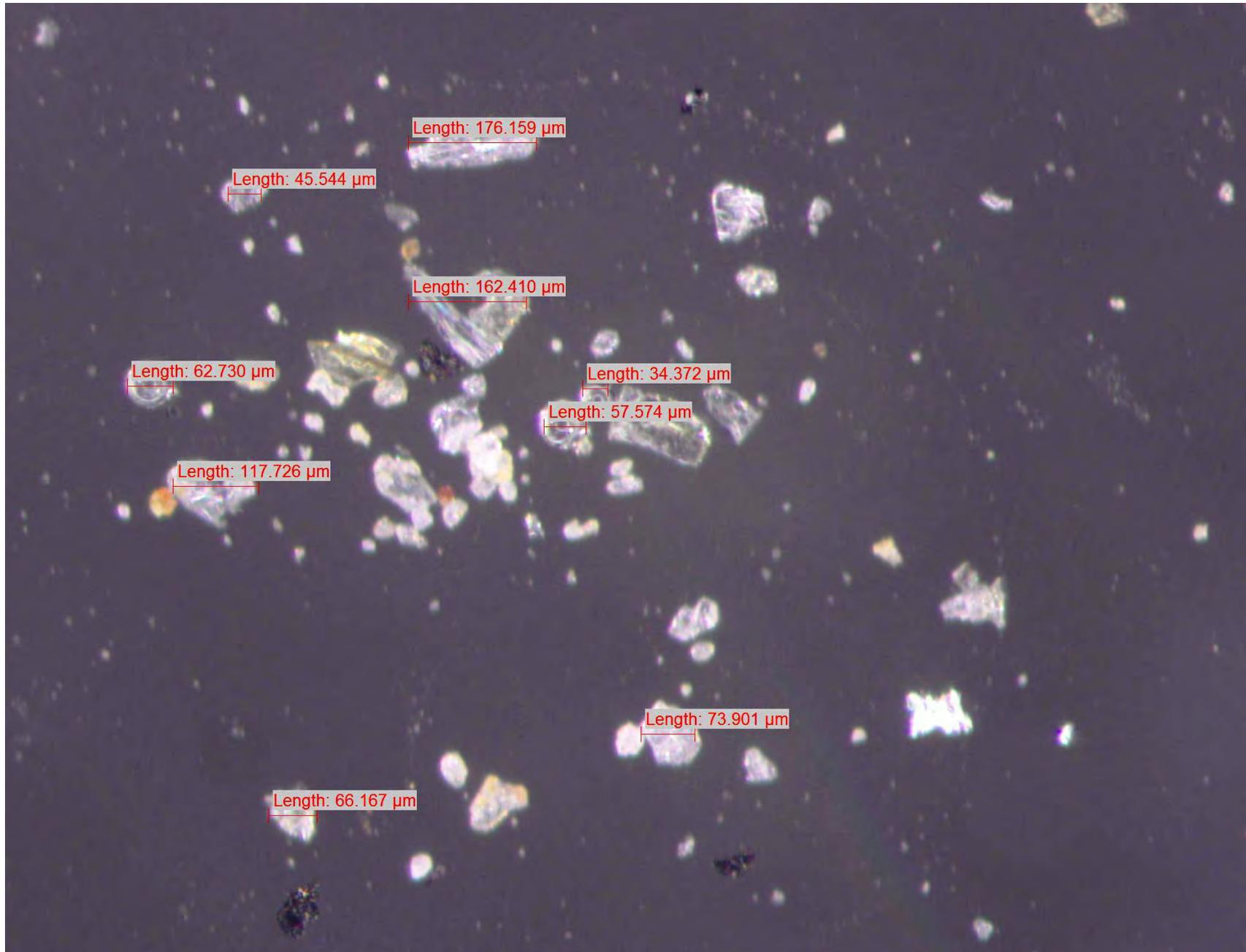
Sample #3 Cont.) – 9 South Pearl St - 330X SEM SEI Microscope Image



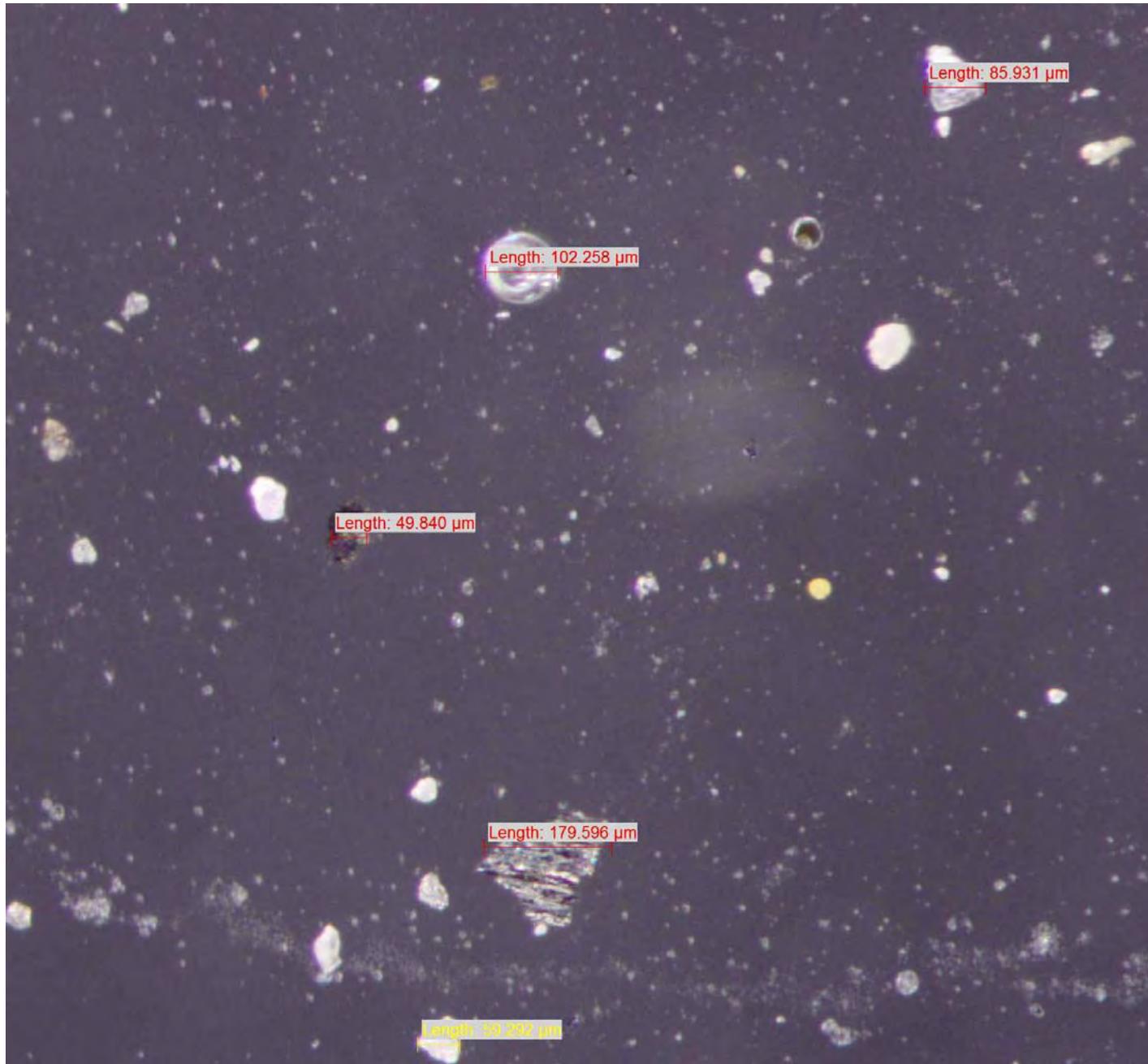
Sample #3 Cont.) – 9 South Pearl St - 370X SEM SEI Microscope Image



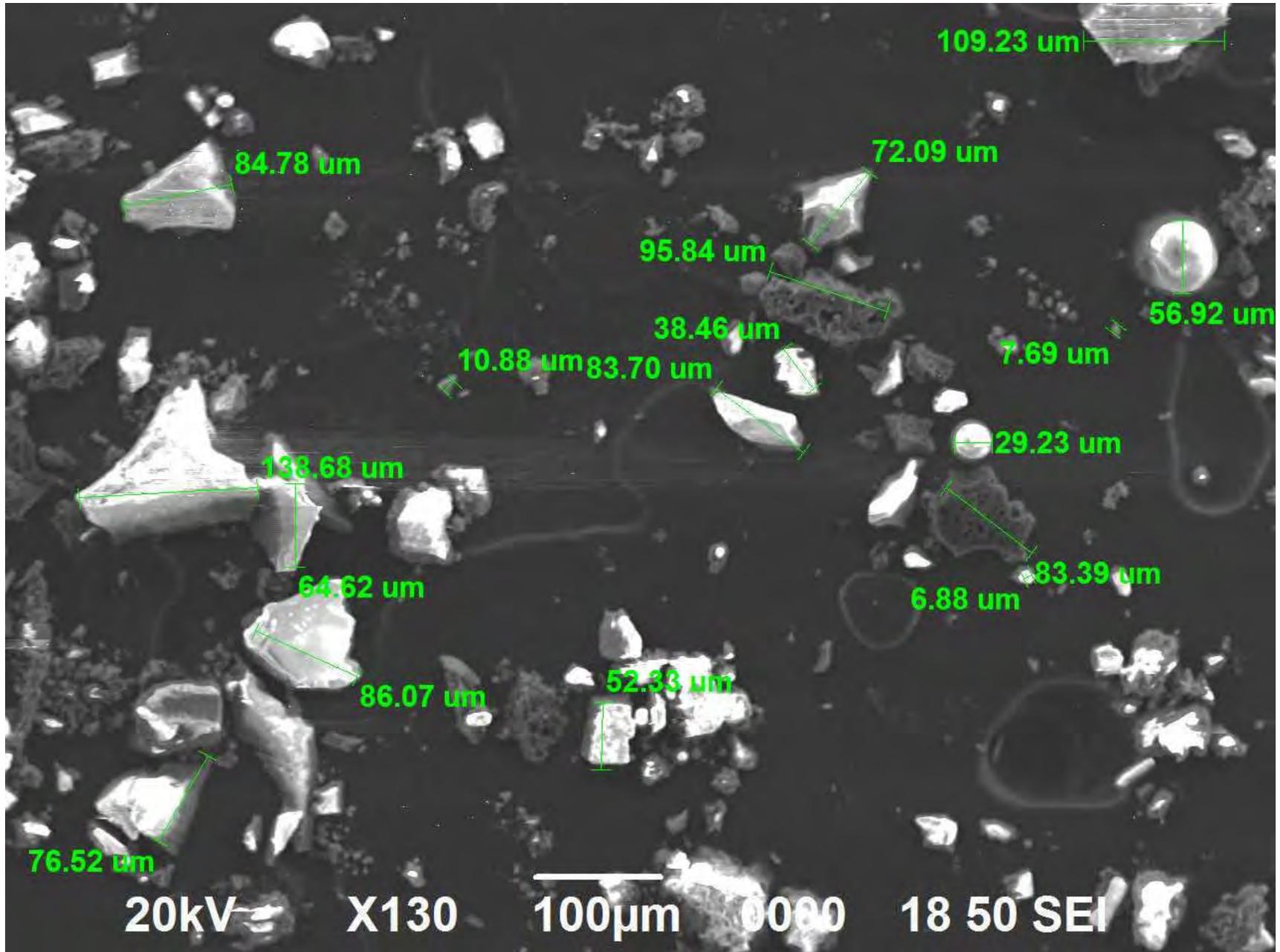
Sample #3 Cont.) – 9 South Pearl St - 90X Stereo Microscope Image



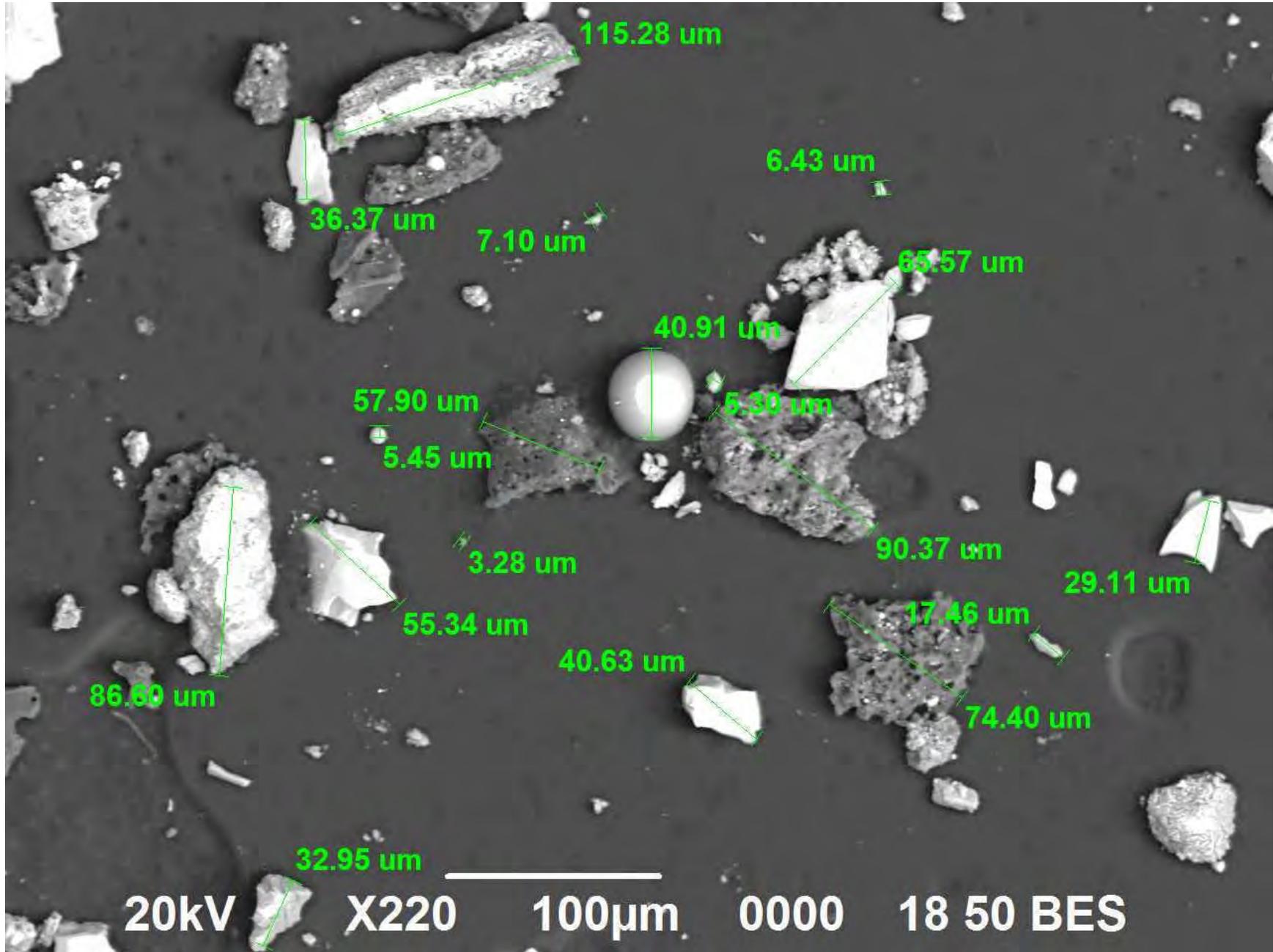
Sample #3 Cont.) – 9 South Pearl St - 90X Stereo Microscope Image



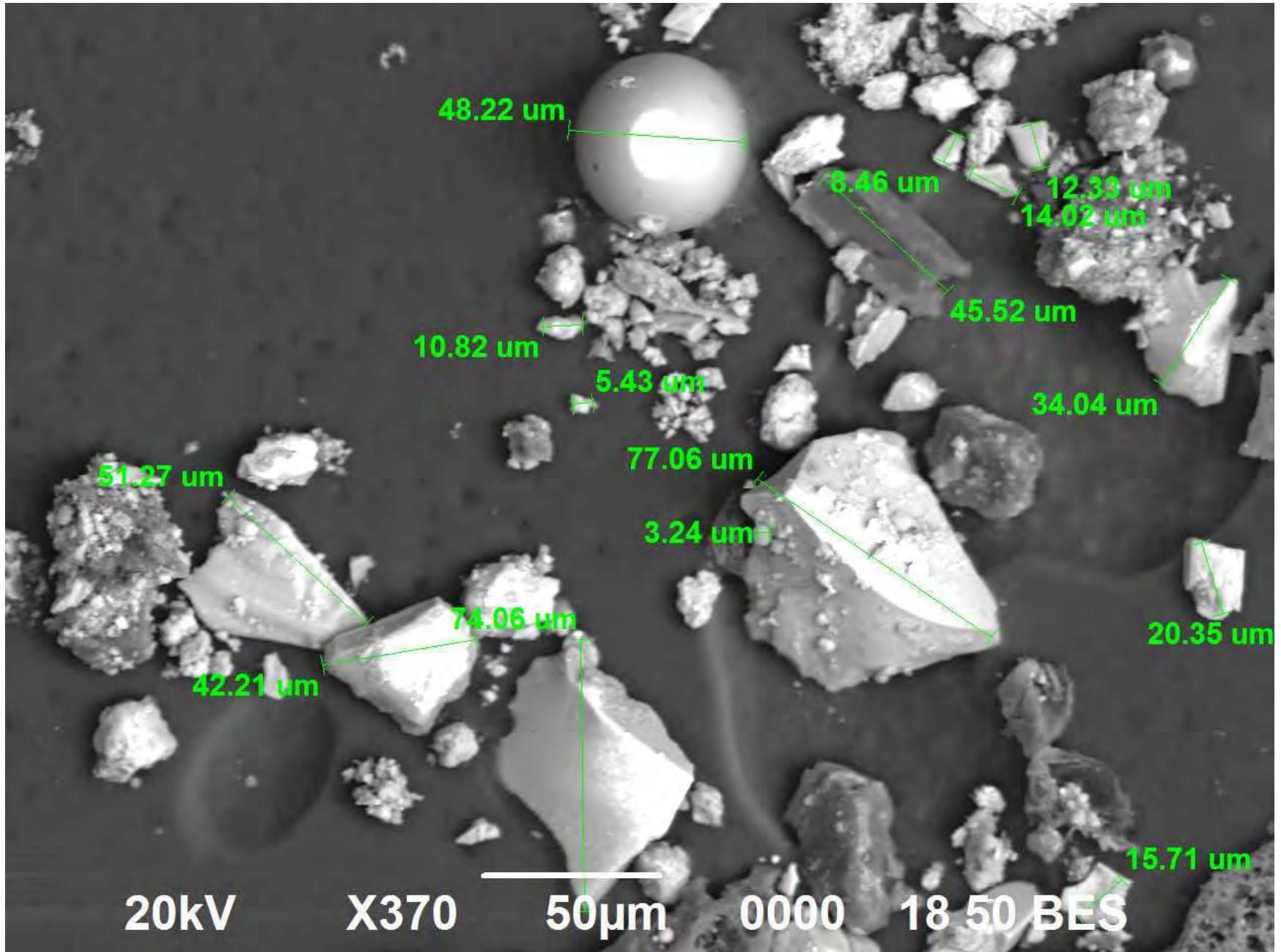
Sample #4 – 27 Favor St - 130X SEM SEI Microscope Image



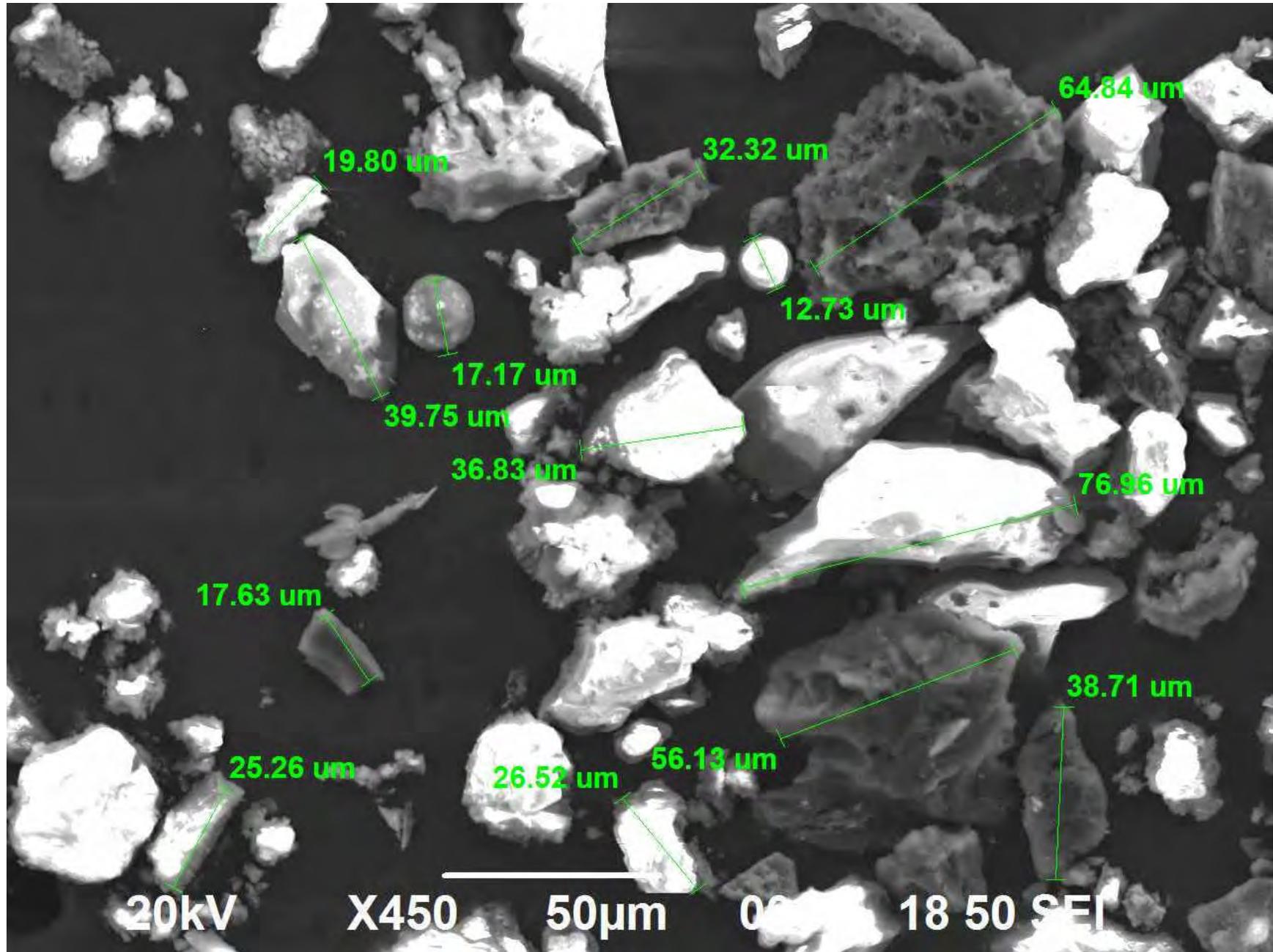
Sample #4 (Cont.) – 27 Favor St - 220X SEM Backscattered Microscope Image



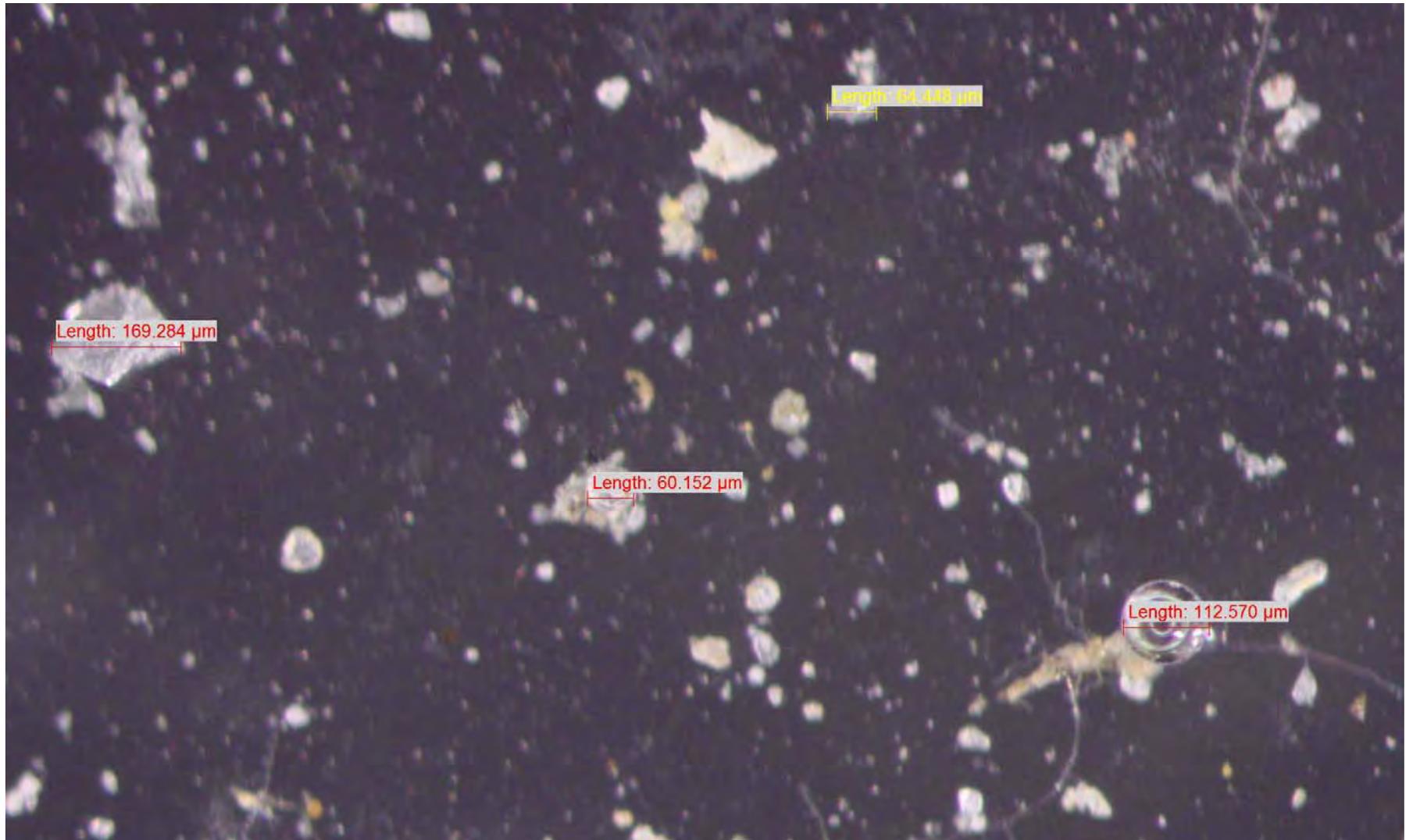
Sample #4 (Cont.) – 27 Favor St - 370X SEM Backscattered Microscope Image



Sample #4 (Cont.) – 27 Favor St - 450X SEM SEI Microscope Image



Sample #4 (Cont.) – 27 Favor St - 63X Stereo Microscope Image



Respirable Particulate discussion

I have estimated the percentage of particles that fall in the 2.5 - 10 micron range that might be attributed to Hillcrest industries per each sample. The percentages are an estimate.

92 Georges St	1% - 5%
20 Jackson St	2% - 6%
20 Jackson St windowsill.....	<1%
9 S. Pearl St	1% - 3%
27 Favor St	4% - 7%

It is interesting to note that although the windowsill sample seemed to have the most glass, almost none in the smaller range was observed.

Conclusions:

The sampled residential area is impacted by a variety of dust / particulate. Biologicals and some, earthy minerals were noted. But unlike most residential samples, the residential samples in the Attica neighbourhood, all have impact from the Hillcrest Industry source. Fractured glass, glassy spheres and in a lesser amount, slag was noted. The morphology of the particulate collected at the residential homes was found to be consistent with the material collected at the facility. The brushed windowsill sample (20 Jackson St) had the most glass in it. Although it had the most glass, these particles were not in the respirable range. Particles linked to the facility were measured and for the most part, found to be above the respirable standard >2.5 microns. . Approximately 1%-7% of the crushed glass in the residential samples was found to be in the 2.5 -10 micron range.

Of the 5 residential complainant samples, all had impact from one or more sources at Hillcrest. Of the many sources investigated, the particulate most closely matched source samples I and J (crushed clear glass that feeds the bead furnace and fines from the furnace cyclone #1). In addition to the glass spheres and fractured glass, some slag product was identified (sample C). New sand and baghouse dust did not seem to be of issue with these samples. Unlike the 2009 samples from the area where slag was the predominant material found, this sample showed that both fractured glass and glass beads were the predominant particulate.