

## Abstract

Wastewater treatment plants (WWTPs) act as secondary sources of microplastic pollution into the environment. Microplastics (MPs) come in various types, namely; filaments, fragments, rods, and beads. They range in size from 5 mm to 1  $\mu\text{m}$ . In this study, spectroscopic, chromatographic, and optical properties of biosolids from Deep East Texas were analyzed via Fourier transform infrared spectroscopy, ion chromatography (IC), and optical microscopy. Samples were taken from San Jacinto (SJWWTP), San Augustine (SAWWTP), Jasper (JWWTP), Lufkin (LWWTP), Nacogdoches (NWWTP), and the Neches Compost Facility (Soil Therapy Compost, STC). Using FT-IR spectral peaks at  $\nu(\text{O-H})$  and  $\nu(\text{N-H})$  ( $\sim 3300\text{ cm}^{-1}$ ),  $\nu(\text{C-H})$   $2930\text{ cm}^{-1}$ ,  $\nu(\text{C=O})$   $1677\text{ cm}^{-1}$ , and  $\nu(\text{Si-OSi})$   $815\text{ cm}^{-1}$ . Via IC analysis  $\text{PO}_4^{3-}$  concentrations were determined above USEPA drinking water regulations in all samples. Concentrations of  $\text{F}^-$ ,  $\text{Cl}^-$ ,  $\text{NO}_2^-$ ,  $\text{NO}_3^-$ ,  $\text{Br}^-$ ,  $\text{SO}_4^{2-}$  were below USEPA drinking water regulations. Via optical microscopy of LWWTP sample, many types of MPs were identified. This study is useful because it adds to the emerging research on microplastic contamination from WWTPs in Deep East Texas.