**Figure 1.** Graphical abstract of workflow.

**Figure 2.** Box plots of the number of gene copies of DNA enteric viruses across each wastewater stage throughout Events 1-4. The unit for the SC in Figures 2A and 2C is gene copies per g of sample.

**Figure 3.** Box plots of the number of genes copies of PMMV across each wastewater stage throughout Events 1-4. The unit for the SC in Figure 3A is gene copies per g of sample.

**Figure 4.** Box plots of the number of gene copies of *uidA* across each wastewater stage throughout Events 1-4. The unit for the SC in Figure 4A is gene copies per g of sample.

**Figure 5.** Principal Component Analysis of log­10-transformed EF parameters, PC1 versus PC2. Only variable not log10-transformed was precipitation due to presence of zero values.

**Figure 6.** Heatmap showing Spearman’s rank correlation analysis between parameters collected for EF sampling events.

**Figure S1.** Box plots of the number of gene copies of Noroviruses GI and GII across each wastewater stage throughout Events 1-4. The unit for the SC in Figures S1A and S1C is gene copies per g of sample.

**Figure S2.** Box plots of the number of gene copies of Rotavirus across each wastewater stage throughout Events 1-4. The unit for the SC in Figure S2A is gene copies per g of sample.

**Figure S3.** Principal Component Analysis of log­10-transformed EF parameters, PC1 versus PC3. Only variable not log10-transformed was precipitation due to presence of zero values.

**Figure S4.** Principal Component Analysis of log­10-transformed EF parameters, PC2 versus PC3. Only variable not log10-transformed was precipitation due to presence of zero values.