**Supplemental Table 1: Advantages and disadvantages of the three approaches used by the consortium to monitor viral levels in wastewater**. The consortium’s terminology for each approach is indicated in italics with a specific description in parentheses. The advantages and disadvantages are framed relative to each of the three approaches.

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| --- | --- | --- |
| **APPROACH** | **ADVANTAGES** | **DISADVANTAGES** |
| *Targeted Viral Detection*(RT/Digital PCR)  | ◦ High Sensitivity ◦ Rapid turnaround (hours-days)◦ Low cost◦ High reproducibility◦ Increased automatability◦ Low technical know-how◦ Influenced less by reaction inhibitors (digital PCR) | ◦ Low Specificity (may miss viral variants/quasi species/strains)◦ Easier to contaminate |
| *Comprehensive Viral Detection*(Probe-based sequencing) | ◦ High Specificity◦ Very comprehensive (hundreds to thousands of viruses – “the virome” captured)◦ Capture viral dynamics (“every signal relative to all other signals”)◦ May reveal novel, temporal, and global viral associations with human activity  | ◦ Low Sensitivity (read and coverage dependent)◦ Less cost effective if sample number is low which may also lower turnaround time (weeks)◦ Reproducibility uncertain◦ Automatable, but more steps involved◦ High technical know-how◦ Computational analysis required◦ Detection dependent on probe library |
| *Targeted Viral Sequencing*(whole-genome sequencing) | ◦ High Sensitivity◦ Very High Specificity (100% genome coverage possible) ◦ Can be used to validate Targeted and Comprehensive approaches◦ Viral variants/quasi species/strains discernible◦ Single SNP resolution (track viral evolution) | ◦ Turnaround (days-weeks)◦ More costly◦ Highly specialized technical and technological know-how◦ Not quantitative to viral load  |