

## Semi Volatiles in Water (EPA 3511), ePrep ONE Automated Sample Preparation

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ePrep Applications

### Key Benefits

- **Fully Automated:** End-to-end processing, no manual handling
- **Cost Efficiency, and Sustainability:** Enhanced laboratory efficiency and throughput
- **Precision:** Improved reproducibility and accuracy
- **Safety:** Reduces exposure to hazardous chemicals
- **Regulatory Compliance:** Meets EPA Method 3511 method criteria

### Introduction



Figure 1: ePrep Sample Preparation Workstation

EPA Method 3511 significantly advances SVOC extraction by using only 35 mL water samples and 2 mL dichloromethane (DCM), offering a 17.5x concentration factor without evaporation steps, supporting cost reduction and greener practices in environmental laboratories.

The ePrep ONE fully automates EPA 3511 liquid-liquid extraction (LLE) for SVOC-Water analysis, processing field samples directly from collection bottles to autosampler vials.

The workflow features ePrep's automated micro liquid-liquid extraction (ALLEx) technology, using analytical syringes to create micron-sized organic droplets that maximize extraction efficiency.

Processing samples directly in 46 mL high recovery (HR) field collection bottles eliminates sample transfer and bottle washing, removing the risk of losing wall-absorbed target analytes. The system automates all steps outlined in Figure 2.

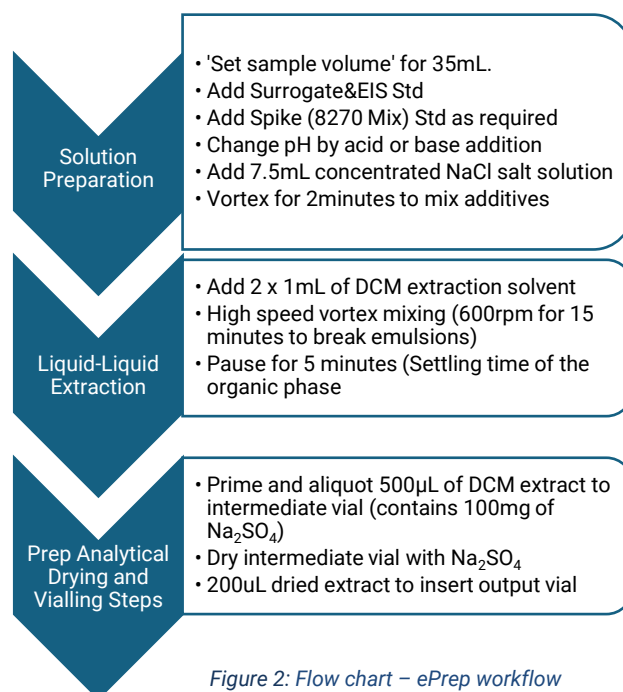


Figure 2: Flow chart – ePrep workflow

### Experimental

Instrumentation: ePrep Sample Preparation Work Station with EPA 3511 configuration.

Analytical: GC-MS/MS (Agilent 8890 GC with 7010B QQQ system).

Sample Types: Drinking water and synthetic wastewater (prepared according to ASTM D5905). Samples were spiked with EPA 8270 Mega Mix at 2.86 ppb (yielding 50 ppb in final DCM extract).

Quantification: Normalized against extractable internal standards (EIS) to account for extraction efficiency and workflow variability. Internal standards are spiked prior to extraction.

## Results and Discussion

Analysis using extractable internal standard (EIS) quantitation demonstrated excellent recovery rates and relative standard deviations (RSDs) across the range of EPA 8270 SVOCs (n=10).

Phenolic compounds showed recovery variations typical of EPA 8270 methods, attributable to chromatographic behavior and matrix interferences inherent to these analytes. Select neutral analytes in synthetic water could be enhanced through sequential neutral-then-acid extraction protocols. The current experimental work employed only acid-modified extraction conditions. Basic compounds require separate basic extraction conditions (pH >11) handled by a dedicated workflow to achieve appropriate recoveries.

## Conclusion

The ePrep ONE system delivers fully automated EPA 3511 SVOC-Water sample preparation.

The Workflow achieves detection limits of 0.29-0.57 ppb and quantitation limits of 0.57-5.7 ppb. Excellent recoveries, 70-130% for most 8270 SVOCs using EIS quantification. High Reproducibility, Low RSDs across replicate analyses.

The ePrep method meets EPA Method 3511 performance criteria and represents a significant advancement in sample preparation, offering improved efficiency, reproducibility, and adaptability over traditional manual extraction methods.

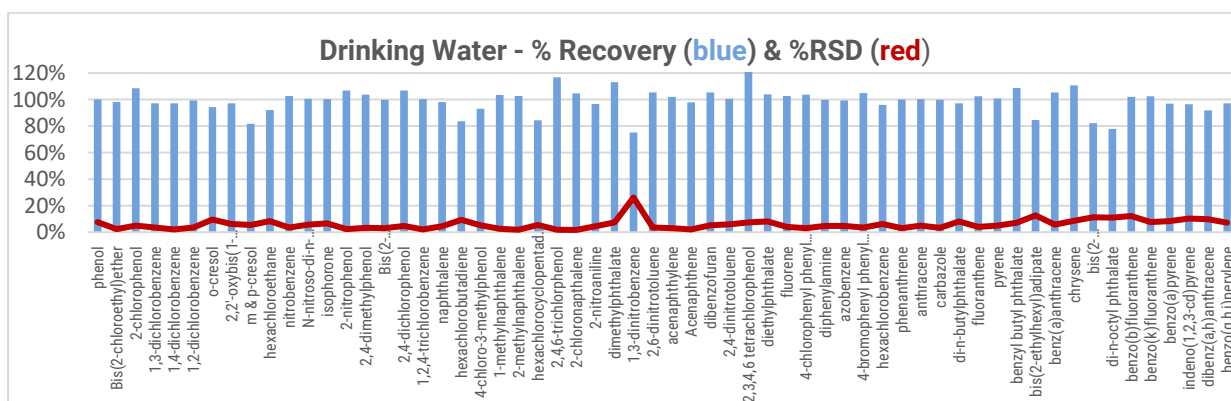


Figure 3: Recovery rate and RSDs for Drinking water

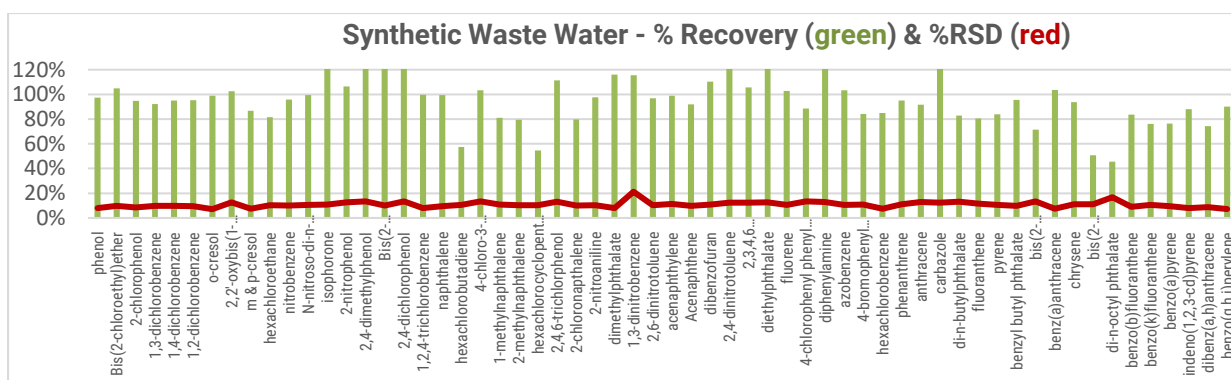


Figure 4: Recovery rate and RSDs for Synthetic waste-water

## Table 1 Other Publications and Resources

Publication	Description
98-35038AP	Application Note: EPA 3511 SVOC Water
98-35038WP	White Paper: SVOC Water (EPA 3511)
98-35038SOP	Standard Operating Procedure: SVOC Water (EPA 3511)
Workflows	ePrep Plug-n-Play Workflow Available for SVOC Water (3511 and Miniaturized 3511)

\* Contact your ePrep distributor to obtain copies of these resource materials

[www.eprep-analytical.com](http://www.eprep-analytical.com)

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