

Microcystin, Cylindrospermopsin, Saxitoxin & Anatoxin-a Report
Project: Utah DEQ – Division of Water Quality

<u>Sample ID</u>	<u>Site</u>	<u>Date Collected</u>
NA	SLC International Airport	7/19/16
5971050	HDC1	7/19/16
NA	NSDC off Ramp	7/19/16
5971120	NSDC1	7/19/16
5971840	NSDC 45	7/19/16
5971700	FB Unit 1 NW	7/19/16

Toxins –microcystins/nodularins (MCs), cylindrospermopsin (CYN), saxitoxin (STX), anatoxin-a (ANTX-A)

Sample Prep

The sample volumes were too low for ultrasonication, so 3 freeze thaw cycles were used to lyse cells. Strata X solid phase extraction (SPE) was utilized to achieve 2x pre-concentration for ANTX-A analysis, with a duplicate lab fortified matrix (LFM) prepared at 0.1 µg/L. LFM for CYN (1 µg/L) and STX (0.2 µg/L) and MC-LR (1.0 µg/L) were also prepared.

Analytical Methodology**MC**

The Adda (Abraxis) microcystins enzyme linked immunosorbent assay (ELISA) was utilized for the quantitative and sensitive congener-independent detection of MCs. The current assay is sensitive to down to a LOD/LOQ of 0.15 µg/L for total MCs. The average recoveries of laboratory fortified blanks (LFB) spiked with 1 µg/L MCLR were 107% and 125%.

CYN

A cylindrospermopsin ELISA (Abraxis) was utilized for the quantitative detection of CYN. The current assay is sensitive down to a LOD/LOQ limit of 0.10 µg/L for CYN. The average LFB recovery was 118%.

STX

A saxitoxin enzyme linked immunosorbent assay (ELISA) was utilized for the quantitative detection of STX. The current assay is sensitive down to a LOD/LOQ limit of 0.05 µg/L STX. The average LFB recovery was 100%.

ANTX-A

Liquid chromatography-mass spectrometry/ mass spectrometry (LC-MS/MS) was utilized for the determination of ANTX-A. The $[M+H]^+$ ion for ANTX-A (m/z 166) was fragmented and the product ions (m/z 56, 91, 107, 131 & 149) were monitored.

Summary of Results

<u>Sample</u>	<u>MC levels</u> ($\mu\text{g/L}$)	<u>CYN levels</u> ($\mu\text{g/L}$)	<u>STX levels</u> ($\mu\text{g/L}$)	<u>ANTX-A levels</u> ($\mu\text{g/L}$)
SLC International Airport	ND	ND	ND	ND
5971050	0.55	ND	ND	ND
NSDC off Ramp	ND	ND	ND	ND
5971120	ND	ND	ND	ND
5971840	ND	ND	ND	ND
5971700	ND	ND	ND	ND
NA	ND	ND	ND	ND
<i>Detection Limits ($\mu\text{g/L}$)</i>	<i>0.15</i>	<i>0.10</i>	<i>0.05</i>	<i>0.05</i>

ND = Not detected above the detection limit

Submitted by:



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Date:

7/23/16