Microcystin, Cylindrospermopsin, Saxitoxin & Anatoxin-a Report

Project: Utah DEQ – Division of Water Quality

Sample ID	Site	Date Collected
NA	Big Cotton Creek	7/20/16
NA	Little Cotton Creek AB WF	7/20/16
NA	Liberty Park	7/20/16
NA	Salt Lake 2 Jordon Canal	7/20/16
NA	East Jordon Canal	7/20/16
NA	Red Butte Ck	7/20/16

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 lyses 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. LFMs 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 recovery of a laboratory fortified blank (LFB) spiked with 1 µg/L MCLR was 117%.

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 110%.

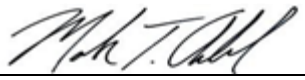
STX
A saxitoxin enzyme linked immunosorbent assay (ELISA) was utilized for the quantitative detection of STX. The current assay is sensitive down to a LOD/LOQ limit of 0.05 µg/L STX. The average LFB recovery was 95%.

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

Sample	MC levels (µg/L)	CYN levels (µg/L)	STX levels (µg/L)	ANTX-A levels (µg/L)
Big Cotton Creek	ND	ND	ND	ND
Little Cotton Creek AB WF	ND	ND	ND	ND
Liberty Park	ND	ND	ND	ND
Salt Lake 2 Jordon Canal	ND	ND	ND	ND
East Jordon Canal	ND	ND	ND	ND
Red Butte Ck	ND	ND	ND	ND
Big Cotton Creek	ND	ND	ND	ND
Detection Limits (µg/L)	*0.15*	*0.10*	*0.05*	*0.05*

ND = Not detected above the detection limit

Submitted by: 
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Date: 7/23/16