Bend Genetics, LLC
87 Scripps Drive, Ste. 301
Sacramento, CA 95825
Tel: (916) 550-1048

Date: 5/29/2018

Subject: Cyanobacteria testing results

From: Tim Otten, Laboratory Director

To: Greg Hoover
Tahoe Keys Property Owners Association

Attached are the testing results for ELISA and QPCR analyses conducted on three samples collected from the Tahoe Keys on 5/10/2018. These data have been reviewed and are considered final.

Analyses included in this report:

- Quantification of specific cyanobacterial toxins (anatoxin-a and microcystin/nodularin) using enzyme linked immunosorbent assay (ELISA).
- Quantification of toxigenic cyanobacteria (anatoxin-a and microcystin-producing cells) based on cyanobacterial gene abundances inferred by real-time quantitative polymerase chain reaction (QPCR) method.

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 5/29/2018 10:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	BG_ID	Date Collected	Date Received	Matrix	Preserved
WP-18	TK28	5/24/2018 9:40	5/24/2018 14:50	Water	N
WP-19	TK29	5/24/2018 9:15	5/24/2018 14:50	Water	N
WP-20	TK30	5/24/2018 8:50	5/24/2018 14:50	Water	N

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 5/29/2018 10:45

SAMPLE RESULTS

Sample ID	Method	Target	Result	Units	Quantitation Limit	Notes
WP-18	ELISA	Anatoxin-a	ND	µg/L	0.15	U
WP-18	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
WP-18	QPCR	Anatoxin-a	ND	copies/mL	100	U
WP-18	QPCR	Microcystin/Nod.	ND	copies/mL	100	U
WP-19	ELISA	Anatoxin-a	ND	µg/L	0.15	U
WP-19	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
WP-19	QPCR	Anatoxin-a	ND	copies/mL	100	U
WP-19	QPCR	Microcystin/Nod.	592	copies/mL	100	
WP-20	ELISA	Anatoxin-a	ND	µg/L	0.15	U
WP-20	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
WP-20	QPCR	Anatoxin-a	178	copies/mL	100	
WP-20	QPCR	Microcystin/Nod.	594	copies/mL	100	

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 5/29/2018 10:45

QUALITY CONTROL

Method	Analyte	Result	Qualifiers / Comments	Units	Spike Level	%REC	%REC Limits
ELISA	ATX - Blank	ND	U	µg/L	0		
ELISA	ATX - Positive	0.70		µg/L	0.75	93.7	70-130
ELISA	ATX - Matrix Sp	1.29		µg/L	1.25	103.5	70-130
ELISA	MC - Blank	ND	U	µg/L	0		
ELISA	MC - Positive	0.58		µg/L	0.75	78.0	70-130
ELISA	MC - Matrix Sp	0.925		µg/L	1.00	92.5	70-130
QPCR	anaC - Blank	ND	U	copies/mL	0		
QPCR	mcyE - Blank	ND	U	copies/mL	0		
QPCR	mcyE – Spike	49,912		copies/mL	50,000	99.8	70-130

QUALIFIERS/COMMENTS/NOTES

C1	The reported concentration for this analyte is below the quantification limit.
C2	The reported concentration for this analyte is above the calibration range of the instrument.
J	The reported result for this analyte should be considered an estimated value.
U	Undetected

Bend Genetics, LLC
87 Scripps Drive, Ste. 301
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Tel: (916) 550-1048

Date: 6/26/2018

Subject: Cyanobacteria testing results

From: Tim Otten, Laboratory Director

To: Greg Hoover
Tahoe Keys Property Owners Association

Attached are the testing results for ELISA and QPCR analyses conducted on four samples collected from the Tahoe Keys on 6/21/2018. These data have been reviewed and are considered final.

Analyses included in this report:

- Quantification of specific cyanobacterial toxins (anatoxin-a and microcystin/nodularin) using enzyme linked immunosorbent assay (ELISA).
- Quantification of toxigenic cyanobacteria (anatoxin-a and microcystin-producing cells) based on cyanobacterial gene abundances inferred by real-time quantitative polymerase chain reaction (QPCR) method.

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 6/26/2018 14:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	BG_ID	Date Collected	Date Received	Matrix	Preserved
CY-04-03	TK31	6/21/2018 8:44	6/22/2018 9:00	Water	N
CY-04-16	TK32	6/21/2018 10:06	6/22/2018 9:00	Water	N
CY-04-14	TK33	6/21/2018 10:30	6/22/2018 9:00	Water	N
CY-04-06	TK34	6/21/2018 10:54	6/22/2018 9:00	Water	N

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 6/26/2018 14:45

SAMPLE RESULTS

Sample ID	Method	Target	Result	Units	Quantitation Limit	Notes
CY-04-03	ELISA	Anatoxin-a	ND	µg/L	0.15	U
CY-04-03	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
CY-04-03	QPCR	Anatoxin-a	ND	copies/mL	100	U
CY-04-03	QPCR	Microcystin/Nod.	ND	copies/mL	100	U
CY-04-16	ELISA	Anatoxin-a	ND	µg/L	0.15	U
CY-04-16	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
CY-04-16	QPCR	Anatoxin-a	ND	copies/mL	100	U
CY-04-16	QPCR	Microcystin/Nod.	ND	copies/mL	100	U
CY-04-14	ELISA	Anatoxin-a	ND	µg/L	0.15	U
CY-04-14	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
CY-04-14	QPCR	Anatoxin-a	ND	copies/mL	100	U
CY-04-14	QPCR	Microcystin/Nod.	ND	copies/mL	100	U
CY-04-06	ELISA	Anatoxin-a	ND	µg/L	0.15	U
CY-04-06	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
CY-04-06	QPCR	Anatoxin-a	ND	copies/mL	100	U
CY-04-06	QPCR	Microcystin/Nod.	ND	copies/mL	100	U

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 6/26/2018 14:45

QUALITY CONTROL

Method	Analyte	Result	Qualifiers / Comments	Units	Spike Level	%REC	%REC Limits
ELISA	ATX - Blank	ND	U	µg/L	0		
ELISA	ATX - Positive	0.64		µg/L	0.75	84.8	70-130
ELISA	ATX - Matrix Sp	1.29		µg/L	1.25	103.0	70-130
ELISA	MC - Blank	ND	U	µg/L	0		
ELISA	MC - Positive	0.56		µg/L	0.75	75.3	70-130
ELISA	MC - Matrix Sp	0.85		µg/L	1.00	85.4	70-130
QPCR	anaC - Blank	ND	U	copies/mL	0		
QPCR	anaC – Spike	38,463		copies/mL	50,000	76.9	70-130
QPCR	mcyE - Blank	ND	U	copies/mL	0		

QUALIFIERS/COMMENTS/NOTES

C1	The reported concentration for this analyte is below the quantification limit.
C2	The reported concentration for this analyte is above the calibration range of the instrument.
J	The reported result for this analyte should be considered an estimated value.
U	Undetected

Bend Genetics, LLC
87 Scripps Drive, Ste. 301
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Tel: (916) 550-1048

Date: 9/5/2018

Subject: Cyanobacteria testing results

From: Tim Otten, Laboratory Director

To: Greg Hoover
Tahoe Keys Property Owners Association

Attached are the testing results for ELISA analyses conducted on four samples collected from the Tahoe Keys on 8/29/2018. These data have been reviewed and are considered final.

Analyses included in this report:

- Quantification of specific cyanobacterial toxins (anatoxin-a and microcystin/nodularin) using enzyme linked immunosorbent assay (ELISA).

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 9/5/2018 14:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	BG_ID	Date Collected	Date Received	Matrix	Preserved
CY-07-06	TK39	8/29/2018 15:30	8/31/2018 9:10	Water	N
CY-07-14	TK40	8/29/2018 15:05	8/31/2018 9:10	Water	N
CY-07-16	TK41	8/29/2018 14:00	8/31/2018 9:10	Water	N
CY-04-LFAJ	TK42	8/29/2018 14:30	8/31/2018 9:10	Water	N

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 9/5/2018 14:55

SAMPLE RESULTS

Sample ID	Method	Target	Result	Units	Quantitation Limit	Notes
CY-07-06	ELISA	Anatoxin-a	0.16	µg/L	0.15	
CY-07-06	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
CY-07-14	ELISA	Anatoxin-a	ND	µg/L	0.15	U
CY-07-14	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
CY-07-16	ELISA	Anatoxin-a	0.17	µg/L	0.15	
CY-07-16	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
CY-04-LFAJ	ELISA	Anatoxin-a	ND	µg/L	0.15	U
CY-04-LFAJ	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 9/5/2018 14:55

QUALITY CONTROL

Method	Analyte	Result	Qualifiers / Comments	Units	Spike Level	%REC	%REC Limits
ELISA	ATX - Blank	ND	U	µg/L	0		
ELISA	ATX - Positive	0.74		µg/L	0.75	98.6	70-130
ELISA	ATX - Matrix Sp	1.30		µg/L	1.25	103.6	70-130
ELISA	MC - Blank	ND	U	µg/L	0		
ELISA	MC - Positive	0.68		µg/L	0.75	91.2	70-130
ELISA	MC - Matrix Sp	0.80		µg/L	1.00	79.9	70-130

QUALIFIERS/COMMENTS/NOTES

C1	The reported concentration for this analyte is below the quantification limit.
C2	The reported concentration for this analyte is above the calibration range of the instrument.
J	The reported result for this analyte should be considered an estimated value.
U	Undetected

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Tel: (916) 550-1048

Date: 9/18/2018

Subject: Cyanobacteria testing results

From: Tim Otten, Laboratory Director

To: Greg Hoover
Tahoe Keys Property Owners Association

Attached are the testing results for ELISA analyses conducted on four samples collected from the Tahoe Keys on 9/12/2018. These data have been reviewed and are considered final.

Analyses included in this report:

- Quantification of specific cyanobacterial toxins (anatoxin-a and microcystin/nodularin) using enzyme linked immunosorbent assay (ELISA).

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 9/18/2018 13:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	BG_ID	Date Collected	Date Received	Matrix	Preserved
CY-08-16	TK43	9/12/2018 13:30	9/14/2018 9:00	Water	N
CY-08-LFAJ	TK44	9/12/2018 13:50	9/14/2018 9:00	Water	N
CY-08-14	TK45	9/12/2018 14:10	9/14/2018 9:00	Water	N
CY-08-06	TK46	9/12/2018 14:25	9/14/2018 9:00	Water	N

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 9/18/2018 13:05

SAMPLE RESULTS

Sample ID	Method	Target	Result	Units	Quantitation Limit	Notes
CY-08-16	ELISA	Anatoxin-a	0.28	µg/L	0.15	
CY-08-16	ELISA	Microcystin/Nod.	0.12	µg/L	0.15	C1,J
CY-08-LFAJ	ELISA	Anatoxin-a	ND	µg/L	0.15	U
CY-08-LFAJ	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
CY-08-14	ELISA	Anatoxin-a	ND	µg/L	0.15	U
CY-08-14	ELISA	Microcystin/Nod.	0.19	µg/L	0.15	
CY-08-06	ELISA	Anatoxin-a	ND	µg/L	0.15	U
CY-08-06	ELISA	Microcystin/Nod.	0.18	µg/L	0.15	

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 9/18/2018 13:05

QUALITY CONTROL

Method	Analyte	Result	Qualifiers / Comments	Units	Spike Level	%REC	%REC Limits
ELISA	ATX - Blank	ND	U	µg/L	0		
ELISA	ATX - Positive	0.68		µg/L	0.75	90.4	70-130
ELISA	ATX - Matrix Sp	1.36		µg/L	1.25	109.0	70-130
ELISA	MC - Blank	ND	U	µg/L	0		
ELISA	MC - Positive	0.70		µg/L	0.75	93.8	70-130
ELISA	MC - Matrix Sp	0.95		µg/L	1.00	94.8	70-130

QUALIFIERS/COMMENTS/NOTES

C1	The reported concentration for this analyte is below the quantification limit.
C2	The reported concentration for this analyte is above the calibration range of the instrument.
J	The reported result for this analyte should be considered an estimated value.
U	Undetected

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Tel: (916) 550-1048

Date: 8/13/2018

Subject: Cyanobacteria testing results

From: Tim Otten, Laboratory Director

To: Greg Hoover
Tahoe Keys Property Owners Association

Attached are the testing results for microscopy, ELISA and QPCR analyses conducted on four samples collected from the Tahoe Keys on 8/8/2018. These data have been reviewed and are considered final.

Analyses included in this report:

- Quantification of specific cyanobacterial toxins (anatoxin-a and microcystin/nodularin) using enzyme linked immunosorbent assay (ELISA).
- Quantification of toxigenic cyanobacteria (anatoxin-a and microcystin-producing cells) based on cyanobacterial gene abundances inferred by real-time quantitative polymerase chain reaction (QPCR) method.
- Microscopic identification of all potentially toxic (PTOX) cyanobacteria.

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 8/13/2018 17:15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	BG_ID	Date Collected	Date Received	Matrix	Preserved
Cy-06-16	TK35	8/8/2018 14:50	8/10/2018 9:00	Water	N
Cy-06-LFAJ	TK36	8/8/2018 15:08	8/10/2018 9:00	Water	N
Cy-06-14	TK37	8/8/2018 15:39	8/10/2018 9:00	Water	N
Cy-06-06	TK38	8/8/2018 15:51	8/10/2018 9:00	Water	N

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 8/13/2018 17:15

SAMPLE RESULTS

Sample ID	Method	Target	Result	Units	Quantitation Limit	Notes
Cy-06-16	ELISA	Anatoxin-a	0.20	µg/L	0.15	
Cy-06-16	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
Cy-06-16	QPCR	Anatoxin-a	4,580	copies/mL	100	
Cy-06-16	QPCR	Microcystin	ND	copies/mL	100	U
Cy-06-LFAJ	ELISA	Anatoxin-a	ND	µg/L	0.15	U
Cy-06-LFAJ	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
Cy-06-LFAJ	QPCR	Anatoxin-a	1,423	copies/mL	100	
Cy-06-LFAJ	QPCR	Microcystin	ND	copies/mL	100	U
Cy-06-14	ELISA	Anatoxin-a	0.51	µg/L	0.15	
Cy-06-14	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
Cy-06-14	QPCR	Anatoxin-a	6,363	copies/mL	100	
Cy-06-14	QPCR	Microcystin	ND	copies/mL	100	U
Cy-06-06	ELISA	Anatoxin-a	ND	µg/L	0.15	U
Cy-06-06	ELISA	Microcystin/Nod.	ND	µg/L	0.15	U
Cy-06-06	QPCR	Anatoxin-a	902	copies/mL	100	
Cy-06-06	QPCR	Microcystin	ND	copies/mL	100	U

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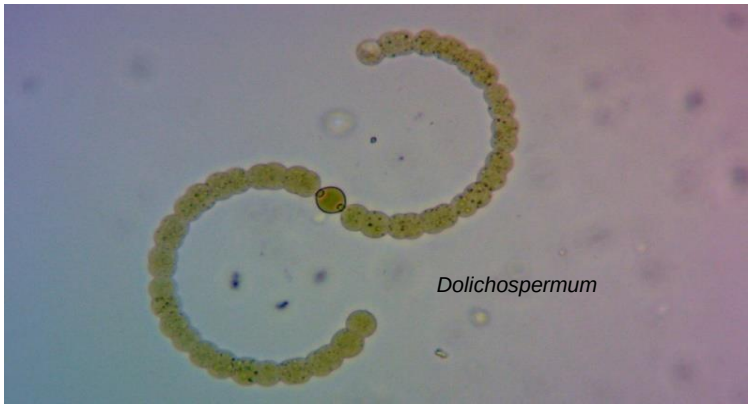
Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 8/13/2018 17:15

MICROSCOPY RESULTS - Identification of CyanoHABs

Sample ID	Dominant	Sub-dominant	Also present	Notes
Cy-06-16	*Dolichospermum*	*Woronichinia*		There was a moderate amount of *Dolichospermum* sp. (consisting of both straight and coiled filaments) and a low amount of *Woronichinia* sp. in this sample; no other cyanobacteria were observed. The photomicrographs were taken under 400X magnification.

Sample ID	Dominant	Present	Present	Notes
Cy-06-LFAJ	*Dolichospermum*			There was a low amount of *Dolichospermum* sp. in this sample; no other cyanobacteria were observed. The photomicrograph was taken under 400X magnification.



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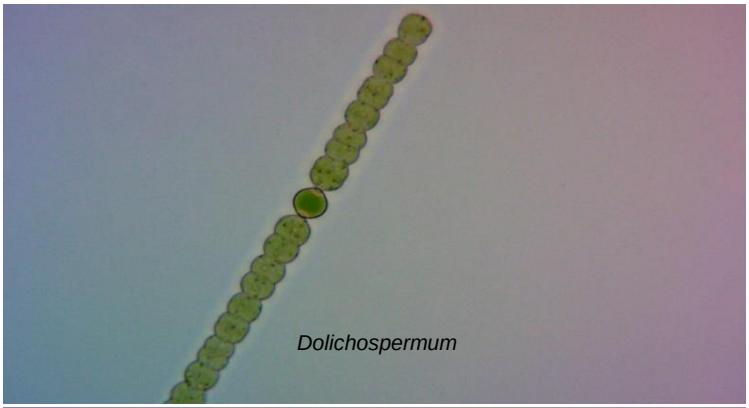
Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 8/13/2018 17:15

MICROSCOPY RESULTS - Identification of CyanoHABs

Sample ID	Dominant	Sub-dominant	Also present	Notes
Cy-06-14	*Dolichospermum*	*Woronichinia*		This sample contained a moderate amount of *Dolichospermum* sp. and a low amount of *Woronichinia* sp.; no other cyanobacteria were observed. The photomicrographs were taken under 400X magnification.



Sample ID	Dominant	Sub-dominant	Present	Notes
Cy-06-06	*Woronichina*	*Dolichospermum*		This sample contained a moderate amount of *Woronichinia* sp. and *Dolichospermum* sp.; no other cyanobacteria were observed. The photomicrograph was taken under 400X magnification.

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Project: SWAMP_FHAB_2018
Analysis for Toxigenic Cyanobacteria
Project #: Tahoe Keys POA
Reported: 8/13/2018 17:15

QUALITY CONTROL

Method	Analyte	Result	Qualifiers / Comments	Units	Spike Level	%REC	%REC Limits
ELISA	ATX - Blank	ND	U	µg/L	0		
ELISA	ATX - Positive	0.68		µg/L	0.75	90.8	70-130
ELISA	ATX - Matrix Sp	1.23		µg/L	1.25	98.4	70-130
ELISA	MC - Blank	ND	U	µg/L	0		
ELISA	MC - Positive	0.62		µg/L	0.75	83.3	70-130
ELISA	MC - Matrix Sp	0.847		µg/L	1.00	84.7	70-130
QPCR	anaC - Blank	ND	U	copies/mL	0		
QPCR	anaC – Spike	44,272		copies/mL	50,000	88.5	70-130
QPCR	mcyE - Blank	ND	U	copies/mL	0		

QUALIFIERS/COMMENTS/NOTES

C1	The reported concentration for this analyte is below the quantification limit.
C2	The reported concentration for this analyte is above the calibration range of the instrument.
J	The reported result for this analyte should be considered an estimated value.
U	Undetected