



Certificate ID: **28891**

Client Sample ID: **RHOWH01**

Matrix: **Concentrates/Extracts - Rick Simpson Oil**

Date Received: **4/3/2018**



**Sustainable Aquatics**

**110 W OLD ANDREW JOHNSON HWY**

**JEFFERSON CITY, TN 37760**

**Attn: Matthew Carberry**

This test method was performed in accordance with the requirements of ISO/IEC 17025. The sample was provided to the laboratory by the client and tested as received. These results relate only to the test article listed in this report. Reports may not be reproduced except in their entirety.

Authorization: Matthew Silva, Chemical Engineer	Signature: 	Date: 4/6/2018
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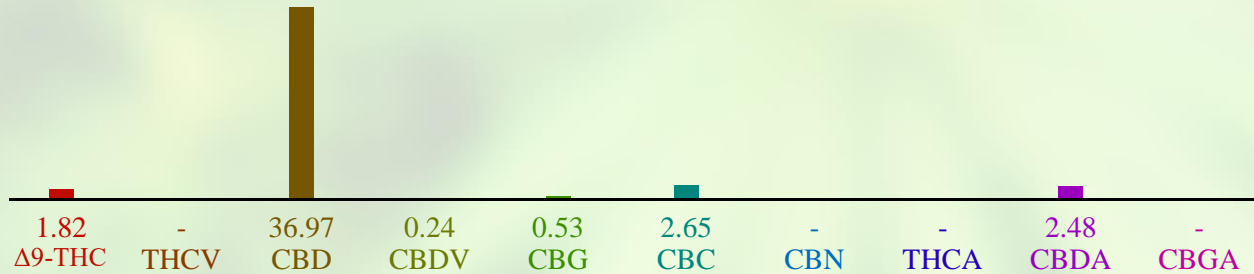
**CN: Cannabinoid Profile & Potency [WI-10-04]**

Analyst: **RAS**

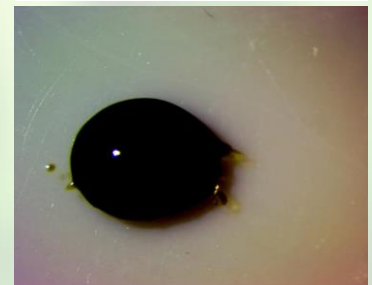
Test Date: **4/4/2018**

The client sample was analyzed for plant-based cannabinoids by Convergence Chromatography (CC). The collected data was compared to data collected for certified reference standards at known concentrations.

**28891-CN**



ID	Weight %	Conc.
Δ9-THC	1.82 wt %	18.23 mg/g
THCV	ND	ND
CBD	36.97 wt %	369.73 mg/g
CBDV	0.24 wt %	2.42 mg/g
CBG	0.53 wt %	5.33 mg/g
CBC	2.65 wt %	26.47 mg/g
CBN	ND	ND
THCA	ND	ND
CBDA	2.48 wt %	24.80 mg/g
CBGA	ND	ND
<b>Total</b>	<b>44.70 wt%</b>	<b>446.98 mg/g</b>
<b>Max THC</b>	<b>1.82 wt%</b>	<b>18.23 mg/g</b>
<b>Max CBD</b>	<b>39.15 wt%</b>	<b>391.48 mg/g</b>



**Ratio of Total CBD to THC 21.5:1**

Max THC (and Max CBD) are calculated values for total cannabinoids after heating, assuming complete decarboxylation of the acid to the neutral form. It is calculated based on the weight loss of the acid group during decarboxylation: Max THC = (0.877 x THCA) + THC. ND = None detected above the limits of detection (LLD)

**EA: Elemental Analysis [WI-10-13]**

Analyst: JFD

Test Date: 4/4/2018

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**28891-EA**

Symbol	Metal	Conc. <sup>1</sup>	MDL	Limits <sup>2</sup>	Status
Al	Aluminum	484 ug/kg	5 ug/kg	-	
As	Arsenic	30 ug/kg	4 ug/kg	1500 ug/kg	PASS
Cd	Cadmium	ND	1 ug/kg	1500 ug/kg	PASS
Ca	Calcium	52,404 ug/kg	500 ug/kg	-	
Cr	Chromium	195 ug/kg	5 ug/kg	25000 ug/kg	PASS
Co	Cobalt	28 ug/kg	10 ug/kg	-	
Cu	Copper	9,386 ug/kg	500 ug/kg	100000 ug/kg	PASS
Fe	Iron	9,722 ug/kg	5 ug/kg	-	
Pb	Lead	ND	2 ug/kg	5000 ug/kg	PASS
Mg	Magnesium	1,215,290 ug/kg	500 ug/kg	-	
Mn	Manganese	10,992 ug/kg	500 ug/kg	-	
Hg	Mercury	ND	2 ug/kg	1500 ug/kg	PASS
Mo	Molybdenum	ND	5000 ug/kg	10000 ug/kg	PASS
Ni	Nickel	ND	500 ug/kg	1500 ug/kg	PASS
P	Phosphorus	ND	500 ug/kg	-	
K	Potassium	ND	5 ug/kg	-	
Se	Selenium	ND	10 ug/kg	-	
Ag	Silver	ND	10 ug/kg	-	
S	Sulfur	872 ug/kg	5 ug/kg	-	
Sn	Tin	ND	5000 ug/kg	-	
Zn	Zinc	11,379 ug/kg	5 ug/kg	-	

1) ND = None detected to the Method Detection Limit (MDL)

2) USP recommended limits for Elemental Analysis.

**MB1: Microbiological Contaminants [WI-10-09]**

Analyst: MS

Test Date: 4/3/2018

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**28891-MB1**

Symbol	Analysis	Results	Units	Limits*	Status
AC	Total Aerobic Bacterial Count	<100	CFU/g	10,000 CFU/g	PASS
CC	Total Coliform Bacterial Count	<100	CFU/g	100 CFU/g	PASS
EB	Total Bile Tolerant Gram Negative Count	<100	CFU/g	100 CFU/g	PASS
YM	Total Yeast & Mold	<100	CFU/g	1,000 CFU/g	PASS

Note: All recorded Microbiological tests are within the established limits.

**MB2: Pathogenic Bacterial Contaminants [WI-10-10]***Analyst: matt**Test Date: 4/4/2018*

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**28891-MB2**

Test ID	Analysis	Results	Units	Limits*	Status
28891-ECPT	E. coli (O157)	Negative	NA	Non Detected	PASS
28891-SPT	Salmonella	Negative	NA	Non Detected	PASS

Note: All recorded pathogenic bacteria tests passed.

**MY: Mycotoxin Testing [WI-10-05]***Analyst: CJB**Test Date: 4/3/2018*

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**28891-MY**

Test ID	Date	Results	MDL	Limits	Status*
Total Aflatoxin	4/3/2018	< MDL	3 ppb	< 20 ppb	PASS
Total Ochratoxin	4/3/2018	< MDL	2 ppb	< 20 ppb	PASS

**PST: Pesticide Analysis [WI-10-11]**

Analyst: KSB

Test Date: 4/5/2018

The client sample was analyzed for pesticides using Liquid Chromatography with Mass Spectrometric detection (LC/MS/MS). The method used for sample prep was based on the European method for pesticide analysis (EN 15662).

**28891-PST**

Analyte	CAS	Result	Units	LLD	Limits (ppb)	Status
Abamectin	71751-41-2	ND	ppb	0.2	10	PASS
Azoxystrobin	131860-33-8	ND	ppb	0.1	10	PASS
Bifenazate	149877-41-8	ND	ppb	0.1	10	PASS
Bifenthrin	82657-04-3	ND	ppb	0.2	10	PASS
Cyfluthrin	68359-37-5	ND	ppb	0.5	10	*
Daminozide	1596-84-5	ND	ppb	10	10	PASS
Dichlorvos	62-73-7	ND	ppb	3	10	*
Etoxazole	153233-91-1	ND	ppb	0.1	10	PASS
Fenoxycarb	72490-01-8	ND	ppb	0.1	10	PASS
Imazalil	35554-44-0	ND	ppb	0.1	10	PASS
Imidacloprid	138261-41-3	ND	ppb	0.1	10	PASS
Myclobutanil	88671-89-0	ND	ppb	0.1	10	PASS
Paclobutrazol	76738-62-0	ND	ppb	0.1	10	PASS
Piperonyl butoxide	51-03-6	ND	ppb	0.1	10	PASS
Pyrethrin	8003-34-7	ND	ppb	0.1	10	PASS
Spinosad	168316-95-8	ND	ppb	0.1	10	PASS
Spiromesifen	283594-90-1	ND	ppb	0.1	10	PASS
Spirotetramat	203313-25-1	ND	ppb	0.1	10	PASS
Trifloxystrobin	141517-21-7	ND	ppb	0.1	10	PASS

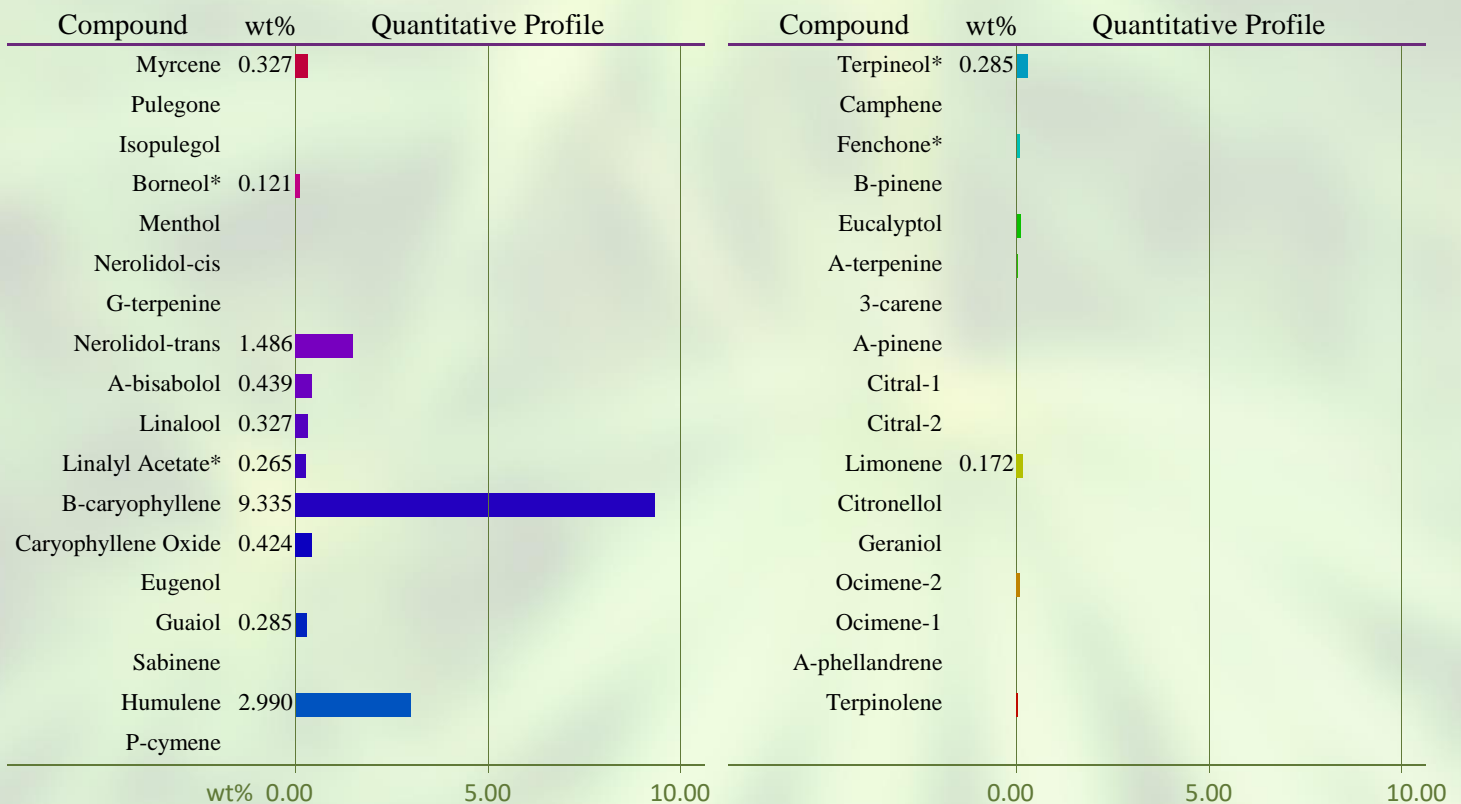
\* Testing limits established by the Massachusetts Department of Public Health, Protocol for Sampling and Analysis of Finished Medical Marijuana Products and Marijuana-Infused Products for Massachusetts Registered Medical Marijuana Dispensaries, Exhibit 5. ND indicates "none detected" above the lower limit of detection (LLD). Analytes marked with (\*) indicate analytes for which no recovery was observed for a pre-spiked matrix sample.

**TP: Terpenes Profile [W1-10-08]**

Analyst: CJH

Test Date: 4/3/2018

The client sample was analyzed by Head-Space Gas Chromatography (HS-GC). The collected data was compared to data collected for certified reference standards at known concentrations.

**28891-TP**

Total Terpene: 16.8 wt%

\* Indicates qualitative calculation based on recorded peak areas.

**VC: Analysis of Volatile Organic Compounds [WI-10-07]**

Analyst: CJH

Test Date: 4/3/2018

The client sample was analyzed by Head-Space Gas Chromatography (HS-GC). The collected data was compared to data collected for certified reference standards at known concentrations.

**28891-VC**

Compound	CAS	Amount <sup>1</sup>	Limit <sup>2</sup>	Status
Methanol	67-56-1	578 ppm	3,000 ppm	PASS
Ethanol	64-17-5	46,355 ppm	5,000 ppm	FAIL
Acetone	67-64-1	40 ppm	5,000 ppm	PASS
Isopropanol	67-63-0	65 ppm	5,000 ppm	PASS
3-methylpentane	96-14-0	76 ppm	N/A	-
Ethyl Acetate	141-78-6	37 ppm	5,000 ppm	PASS
Heptane	142-82-5	44 ppm	5,000 ppm	PASS

1) ND = None detected above 5 ppm.

2) In ppm, based on USP recommended limits for residual solvents, adopted by the Massachusetts Department of Public Health on 3/31/16. Butane/Propane limits are based on limits established for state of Colorado.

**END OF REPORT**