

Certificate ID: 39207-46

Received: 9/6/18

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KlerSun

Client Sample ID: 188-24.33 F3/4

3580 NE Broadway

Lot Number:

Portland, OR 97232

Matrix: Concentrates/Extracts - CO2

Attn: Michael Dorr



Authorization:

Chris Hudalla, Chief Science Officer

Signature:

Christopher Hudalla

Date:

1/27/2019



The data contained within this report was collected in accordance with the requirements of ISO/IEC 17025:2005. I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the test article listed in this report. Reports may not be reproduced except in their entirety.

CN: Cannabinoid Profile & Potency [WI-10-17 & WI-10-17-01]

Analyst: CJH

Test Date: 9/8/2018

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. Estimation of exo-THC signal is 0.20%, based on area relative to THC standard.

39207-CN

ID	Weight %	Conc.		
D9-THC	0.12 wt %	1.24 mg/g		
THCV	ND	ND		
CBD	79.25 wt %	792.51 mg/g		
CBDV	1.47 wt %	14.68 mg/g		
CBG	0.03 wt %	0.33 mg/g		
CBC	0.11 wt %	1.06 mg/g		
CBN	ND	ND		
THCA	ND	ND		
CBDA	ND	ND		
CBGA	ND	ND		
Total	80.98 wt%	809.81 mg/g	0%	Cannabinoids (wt%) 79.3%
Max THC	0.12 wt%	1.24 mg/g		
Max CBD	79.25 wt%	792.51 mg/g		



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)

END OF REPORT

188-24.33-F3/F4

Klersun LLC
3580 NE Broadway
Portland, OR 97232
310-728-0559Sample Type: Other
Sample Date: 1/7/2019
Analysis Date: 1/1/2019
Report Date: 1/10/2019Metric Batch ID:
Client's Batch ID:
Harvest/Process Date:Report ID:
LS-190110-74

Compliance

Pesticides	Within limits	Analysis Date: 1/7/2019	Pass 
Solvents	Within limits	Analysis Date: 1/8/2019	Pass 


Ian Eustis
Lab Director
Aaron Troyer
Chief Science Officer

This data cannot be used for OLCC or OHA compliance for usable marijuana or marijuana products and is provided for Research and Development purposes only.



188-24.33-F3/F4

Klersun LLC
 3580 NE Broadway
 Portland, OR 97232
 310-728-0559

Sample Type: Other
 Sample Date: 1/7/2019
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LS-190110-74



Terpene Analysis Date: 1/9/2019
 Terpene Batch ID: TRP_010919A

Method: JAOAC 2015.1
 Unit: %

Analyte	Avg.	Notes
β-Myrcene	0.278%	-
α-Bisabolol	0.247%	-
β-Caryophyllene	0.142%	-
Limonene	0.120%	-
Terpinolene	0.0978%	-
Humulene	0.0744%	-
Selinadiene	0.0694%	-
β-Pinene	0.0431%	-
Linalool	0.0387%	-
α-Terpineol	0.0341%	-
α-Pinene	0.0314%	-
Azulene	ND	-
Borneol	ND	-
Camphene	ND	-
Camphore	ND	-
Caryophyllene Oxide	ND	-
Cedrol	ND	-
Cymene	ND	-
Eucalyptol	ND	-
Fenchol	ND	-
Fenchone	ND	-
Geraniol	ND	-
Geranyl Acetate	ND	-
Guaiol	ND	-
Isoborneol	ND	-
Isopulegol	ND	-
Nerol	ND	-
Pulegone	ND	-
Sabinene	ND	-
Sabinene Hydrate	ND	-
Valencene	ND	-
cis-Nerolidol	ND	-
trans-Nerolidol	ND	-
Δ ³ -Carene	ND	-

Analyte	Avg.	Notes
α-Cedrene	ND	-
α-Ocimene	ND	-
α-Phellandrene	ND	-
α-Terpinene	ND	-
β-Farnesene 1	ND	-
β-Farnesene 2	ND	-
β-Ocimene	ND	-
γ-Terpinene	ND	-
γ-Terpineol	ND	-
Total	1.18%	-

188-24.33-F3/F4

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LS-190110-74



Pesticides Sample Data

Pesticides Analysis Date: 1/7/2019
 Pesticides Batch ID: PST_010719A

Method: EN 15662
 Unit: µg/g (ppm)

Pass 

Analyte	TFZ-GNP-ZHW	Limits	LOQ	Notes	Status	Analyte	TFZ-GNP-ZHW	Limits	LOQ	Notes	Status
Abamectin	<LOQ	0.5	0.1	-	Pass	Metalaxyl	<LOQ	0.2	0.1	-	Pass
Acephate	<LOQ	0.4	0.1	-	Pass	Methiocarb	<LOQ	0.2	0.1	-	Pass
Acequinocyl	<LOQ	2.0	1.5	-	Pass	Methomyl	<LOQ	0.4	0.1	-	Pass
Acetamiprid	<LOQ	0.2	0.1	-	Pass	Methyl Parathion	<LOQ	0.2	0.2	-	Pass
Aldicarb	<LOQ	0.4	0.1	-	Pass	MGK-264	<LOQ	0.2	0.2	-	Pass
Azoxystrobin	<LOQ	0.2	0.1	-	Pass	Myclobutanil	<LOQ	0.2	0.1	-	Pass
Bifenazate	<LOQ	0.2	0.1	-	Pass	Naled	<LOQ	0.5	0.2	-	Pass
Bifenthrin	<LOQ	0.2	0.1	-	Pass	Oxamyl	<LOQ	1.0	0.1	-	Pass
Boscalid	<LOQ	0.4	0.1	-	Pass	Paclobutrazol	<LOQ	0.4	0.1	-	Pass
Carbaryl	<LOQ	0.2	0.1	-	Pass	Permethrins	<LOQ	0.2	0.1	-	Pass
Carbofuran	<LOQ	0.2	0.1	-	Pass	Phosmet	<LOQ	0.2	0.1	-	Pass
Chlorantraniliprole	<LOQ	0.2	0.1	-	Pass	Piperonyl Butoxide	<LOQ	2.0	0.1	-	Pass
Chlorfenapyr	<LOQ	1.0	0.1	-	Pass	Prallethrin	<LOQ	0.2	0.1	-	Pass
Chlorpyrifos	<LOQ	0.2	0.1	-	Pass	Propiconazole	<LOQ	0.4	0.1	-	Pass
Clofentezine	<LOQ	0.2	0.1	-	Pass	Propoxur	<LOQ	0.2	0.1	-	Pass
Cyfluthrin	<LOQ	1.0	0.5	-	Pass	Pyrethrins	<LOQ	1.0	0.5	-	Pass
Cypermethrin	<LOQ	1.0	0.1	-	Pass	Pyridaben	<LOQ	0.2	0.1	-	Pass
Daminozide	<LOQ	1.0	0.5	-	Pass	Spinosad	<LOQ	0.2	0.1	-	Pass
Diazinon	<LOQ	0.2	0.1	-	Pass	Spiromesifen	<LOQ	0.2	0.1	-	Pass
Dichlorvos (DDVP)	<LOQ	1.0	0.5	-	Pass	Spirotetramat	<LOQ	0.2	0.1	-	Pass
Dimethoate	<LOQ	0.2	0.1	-	Pass	Spiroxamine	<LOQ	0.4	0.1	-	Pass
Ethoprophos	<LOQ	0.2	0.1	-	Pass	Tebuconazole	<LOQ	0.4	0.1	-	Pass
Etofenprox	<LOQ	0.4	0.1	-	Pass	Thiacloprid	<LOQ	0.2	0.1	-	Pass
Etoxazole	<LOQ	0.2	0.1	-	Pass	Thiamethoxam	<LOQ	0.2	0.1	-	Pass
Fenoxycarb	<LOQ	0.2	0.1	-	Pass	Trifloxystrobin	<LOQ	0.2	0.1	-	Pass
Fenpyroximate	<LOQ	0.4	0.1	-	Pass						
Fipronil	<LOQ	0.4	0.1	-	Pass						
Flonicamid	<LOQ	1.0	0.1	-	Pass						
Fludioxonil	<LOQ	0.4	0.1	-	Pass						
Hexythiazox	<LOQ	1.0	0.1	-	Pass						
Imazalil	<LOQ	0.2	0.1	-	Pass						
Imidacloprid	<LOQ	0.4	0.1	-	Pass						
Kresoxim-methyl	<LOQ	0.4	0.1	-	Pass						
Malathion	<LOQ	0.2	0.1	-	Pass						

188-24.33-F3/F4

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 Portland, OR 97232
 310-728-0559

Sample Type: Other
 Sample Date: 1/7/2019
 Analysis Date: 1/1/2019
 Report Date: 1/10/2019

Metric Batch ID:
 Client's Batch ID:
 Harvest/Process Date:

Report ID:
LS-190110-74



Pesticides Quality Control Data

Pesticides QC Analysis Date: 1/7/2019
 Pesticides QC Batch ID: PST_010719A

Method: EN 15662
 Unit: µg/g (ppm)

Laboratory Pesticides Quality Control Results

Method: EN 15662				Units: ppm (µg/g)				Analysis date: 1/7/19				Batch ID: PST_010719A					
Pesticide	Blank Result	LOQ	Notes	LCS Result	LCS Spike	LCS% Rec	Limits	Notes	Pesticide	Blank Result	LOQ	Notes	LCS Result	LCS Spike	LCS% Rec	Limits	Notes
Abamectin	nd	0.1		1.3	1.0	129	50 - 150		Imazalil	nd	0.1		0.8	1.0	79	50 - 150	
Acephate	nd	0.1		1.1	1.0	110	50 - 150		Imidacloprid	nd	0.1		1.0	1.0	105	50 - 150	
Acequinocyl	nd	1.0		0.6	1.0	65	50 - 150		Kresoxim-methyl	nd	0.1		1.1	1.0	112	50 - 150	
Acetamiprid	nd	0.1		1.1	1.0	106	50 - 150		Malathion	nd	0.1		1.1	1.0	108	50 - 150	
Aldicarb	nd	0.1		1.1	1.0	106	50 - 150		Metaxyl	nd	0.1		1.1	1.0	112	50 - 150	
Azoxystrobin	nd	0.1		1.1	1.0	107	50 - 150		Methiocarb	nd	0.1		1.1	1.0	115	50 - 150	
Bifenthrin	nd	0.1		1.1	1.0	113	50 - 150		Methomyl	nd	0.1		1.2	1.0	115	50 - 150	
Bifenazate	nd	0.1		1.2	1.0	124	50 - 150		Methyl Parathion	nd	0.1		0.6	1.0	64	30 - 150	
Boscalid	nd	0.1		1.3	1.0	126	50 - 150		MGK-264	nd	0.2		1.1	1.0	115	50 - 150	
Carbaryl	nd	0.1		1.0	1.0	103	50 - 150		Myclobutanil	nd	0.1		1.1	1.0	106	50 - 150	
Carbofuran	nd	0.1		1.0	1.0	102	50 - 150		Naled	nd	0.1		1.0	1.0	96	50 - 150	
Chlorantraniliprole	nd	0.1		1.0	1.0	103	50 - 150		Oxamyl	nd	0.1		1.1	1.0	110	50 - 150	
Chlorfenapyr	nd	0.1		1.0	1.0	96	50 - 150		Paclobutrazol	nd	0.1		1.0	1.0	96	50 - 150	
Chlorpyrifos	nd	0.1		1.1	1.0	108	50 - 150		Permethrin	nd	0.1		1.0	1.0	104	50 - 150	
Clofentezine	nd	0.1		1.0	1.0	98	50 - 150		Phosmet	nd	0.1		1.1	1.0	109	50 - 150	
Cyfluthrin	nd	0.5		1.3	1.0	130	50 - 150		Piperonyl Butoxide	nd	0.1		1.0	1.0	103	50 - 150	
Cypermethrin	nd	0.1		1.1	1.0	109	50 - 150		Prallethrin	nd	0.1		1.0	1.0	102	50 - 150	
Daminozide	nd	0.5		0.2	1.0	20	10 - 150		Propiconazole	nd	0.1		1.1	1.0	109	50 - 150	
Diazinon	nd	0.1		1.1	1.0	105	50 - 150		Propoxur	nd	0.1		1.0	1.0	103	50 - 150	
Dichlorvos	nd	0.5		1.0	1.0	100	50 - 150		Pyrethrins	nd	0.2		1.1	1.0	114	50 - 150	
Dimethoate	nd	0.1		1.1	1.0	111	50 - 150		Pyridaben	nd	0.1		1.0	1.0	100	50 - 150	
Ethoprophos	nd	0.1		1.0	1.0	95	50 - 150		Spinosad A kps	nd	0.1		0.8	1.0	81	50 - 150	
Etofenprox	nd	0.1		1.1	1.0	112	50 - 150		Spinosad D kps	nd	0.1		0.1	0.1	74	50 - 150	
Etoxazole	nd	0.1		1.1	1.0	106	50 - 150		Spiromesifen	nd	0.1		1.1	1.0	115	50 - 150	
Fenoxycarb	nd	0.1		1.1	1.0	112	50 - 150		Spirotetramat	nd	0.1		1.1	1.0	110	50 - 150	
Fenpyroximate	nd	0.1		1.0	1.0	100	50 - 150		Spiroxamine	nd	0.1		0.7	1.0	69	50 - 150	
Fipronil	nd	0.1		1.3	1.0	130	50 - 150		Tebuconazole	nd	0.1		1.0	1.0	102	50 - 150	
Flonicamid	nd	0.1		1.2	1.0	121	50 - 150		Thiacloprid	nd	0.1		1.0	1.0	100	50 - 150	
Fludioxonil	nd	0.1		1.2	1.0	119	50 - 150		Thiamethoxam	nd	0.1		1.1	1.0	111	50 - 150	
Hexythiazox	nd	0.1		1.0	1.0	96	50 - 150		Trifloxystrobin	nd	0.1		1.1	1.0	106	50 - 150	

188-24.33-F3/F4

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 3580 NE Broadway
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Sample Type: Other
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 Report Date: 1/10/2019

Metric Batch ID:
 Client's Batch ID:
 Harvest/Process Date:

Report ID:
LS-190110-74



Residual Solvents Sample Data

Solvents Analysis Date: 1/8/2019
 Solvents Batch ID: RES_010719A

Method: EPA 5021A
 Unit: µg/g (ppm)

Pass 

Analyte	TFZ-GNP-ZHW	RPD (%)	Limits	LOQ	Notes	Status
1,4-Dioxane	<LOQ	0.00	380.0	50.0	-	Pass
2-Butanol	<LOQ	0.00	5000.0	50.0	-	Pass
2-Ethoxyethanol	<LOQ	0.00	160.0	50.0	-	Pass
Acetone	<LOQ	0.00	5000.0	50.0	-	Pass
Acetonitrile	<LOQ	0.00	410.0	50.0	-	Pass
Benzene	<LOQ	0.00	2.0	2.0	-	Pass
Butanes	<LOQ	0.00	5000.0	50.0	-	Pass
Cumene	<LOQ	0.00	70.0	50.0	-	Pass
Cyclohexane	<LOQ	0.00	3880.0	50.0	-	Pass
Ethyl Acetate	<LOQ	0.00	5000.0	50.0	-	Pass
Ethyl Ether	<LOQ	0.00	5000.0	50.0	-	Pass
Ethylene Glycol	<LOQ	0.00	620.0	250.0	-	Pass
Ethylene Oxide	<LOQ	0.00	50.0	50.0	-	Pass
Heptane	<LOQ	0.00	5000.0	50.0	-	Pass
Hexanes	<LOQ	0.00	290.0	50.0	-	Pass
Isopropanol (2-Propanol)	<LOQ	0.00	5000.0	50.0	-	Pass
Isopropyl Acetate	<LOQ	0.00	5000.0	50.0	-	Pass
Methanol	<LOQ	0.00	3000.0	50.0	-	Pass
Dichloromethane	<LOQ	0.00	600.0	50.0	-	Pass
Pentanes	<LOQ	0.00	5000.0	50.0	-	Pass
Propane	<LOQ	0.00	5000.0	50.0	-	Pass
Tetrahydrofuran	<LOQ	0.00	720.0	50.0	-	Pass
Toluene	<LOQ	0.00	890.0	50.0	-	Pass
Xylenes	<LOQ	0.00	2170.0	50.0	-	Pass

188-24.33-F3/F4

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LS-190110-74



Residual Solvents Quality Control Data

Solvents QC Analysis Date: 1/8/2019
 Solvents QC Batch ID: RES_010719A

Method: EPA 5021A
 Unit: µg/g (ppm)

Laboratory Residual Solvent Quality Control Results

Method: EPA 5021A Units: µg/mL Batch ID: RES_010719A

Matrix Blank / LCS Results

Analyte	Blank Result	Blank Limit	Notes	LCS Result	LCS Spike	LCS% Rec	Limits	Notes
1,4-Dioxane	< LOQ	50		1098	1000	110	70 - 130	
2-Butanol	< LOQ	50		1247	1000	125	70 - 130	
2-Ethoxyethanol	< LOQ	50		989	1000	99	70 - 130	
Acetone	< LOQ	50		1024	1000	102	70 - 130	
Acetonitrile	< LOQ	50		1257	1000	126	70 - 130	
Benzene	< LOQ	2		22	20	110	70 - 130	
Butanes								
<i>Butane</i>	< LOQ	50		1178	1000	118	70 - 130	
<i>Isobutane</i>	< LOQ	50		1215	1000	122	70 - 130	
Cyclohexane	< LOQ	50		1008	1000	101	70 - 130	
Ethyl acetate	< LOQ	50		1238	1000	124	70 - 130	
Ethyl ether	< LOQ	50		956	1000	96	70 - 130	
Ethylbenzene	< LOQ	50		1238	1000	124	70 - 130	
Ethylene glycol	< LOQ	250		823	1000	82	70 - 130	
Ethylene oxide	< LOQ	50		1193	1000	119	70 - 130	
Heptane	< LOQ	50		1248	1000	125	70 - 130	
Hexanes								
<i>n-Hexane</i>	< LOQ	50		987	1000	99	70 - 130	
<i>2-Methylpentane</i>	< LOQ	50		1245	1000	124	70 - 130	
<i>3-Methylpentane</i>	< LOQ	50		1008	1000	101	70 - 130	
<i>2,2-Dimethylbutane</i>	< LOQ	50		1184	1000	118	70 - 130	
<i>2,3-Dimethylbutane</i>	< LOQ	50		1200	1000	120	70 - 130	
Isopropanol	< LOQ	50		1211	1000	121	70 - 130	
Isopropyl acetate	< LOQ	50		1251	1000	125	70 - 130	
Cumene	< LOQ	50		1226	1000	123	70 - 130	
Methanol	< LOQ	50		925	1000	93	70 - 130	
Dichloromethane	< LOQ	50		1125	1000	112	70 - 130	
Pentanes								
<i>Pentane</i>	< LOQ	50		1262	1000	126	70 - 130	
<i>Isopentane</i>	< LOQ	50		1254	1000	125	70 - 130	
<i>Neopentane</i>	< LOQ	50		1012	1000	101	70 - 130	
Propane	< LOQ	50		1002	1000	100	70 - 130	
Tetrahydrofuran	< LOQ	50		1259	1000	126	70 - 130	
Toluene	< LOQ	50		1083	1000	108	70 - 130	
Xylenes								
<i>m-Xylene</i>	< LOQ	50		1253	1000	125	70 - 130	
<i>o/p-Xylene</i>	< LOQ	50		2498	2000	125	70 - 130	



2535 N Ross Ave info@lightscale.com
Portland, OR 97227 ORELAP #4112
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Qualifier Flag Descriptions

- J** Reported result is an estimate - the value is less than the minimum calibration level but greater than the estimated detection limit (EDL)
- U** The analyte was not detected in the sample at the estimated detection limit (EDL)
- E** Exceeds calibration range
- D** Dilution data - result was obtained from the analysis of a dilution
- B** Analyte found in sample and associated blank
- C** Co-eluting compound
- R** Relative Percent Difference (RPD) outside control limits
- NR** Analyte not reported because of problems in sample preparation or analysis
- ND** Non-Detect
- X** Results from reinjection/repeat/re-column data
- EMC** Estimated maximum possible concentration - indicates that a peak is detected but did not meet the method required criteria
- M** Manual integration
- PS** Peaks split
- HB** Control acceptance criteria are exceeded high and the associated sample is below the detection limit
- LB** Control acceptance criteria are exceeded low and the associated sample exceeds the regulatory limit
- ME** Marginal Exceedance
- LR** Low Recovery Analyte
- LOQ** Limit of Quantitation