

HIGH NORTH ID:  
00405949  
Date: 2023-11-22  
Certificate: 1700699034



High North Inc.  
241 Hanlan Rd, Unit 7  
Woodbridge, ON, L4L 3R7  
1-416-864-6119  
LIC-P4PNJMAC20-2022

Client:	PINNRZ Inc. 1-3280 Langstaff Road,, N/A, Vaughan, ON, L4K 5B6	Product:	Triple Eh
Name:	PINNRZ 6472911686 qa@pinnrz.com	Lot:	11045B1
		Matrix:	Flower
		Sub-matrix:	Pre-roll
		Sampled:	2023-11-14
		Received:	2023-11-14


## Certificate of Analysis

Cannabinoid Analysis	LOD (%)	LOQ (%)	wt%	mg/g
Total THC [(THCA x 0.877) + D9-THC]			36.6318	366.3181
Total CBD [(CBDA x 0.877) + CBD]			0.1502	1.5019
THCA-A	0.03	0.06	39.4987	394.9870
D9-THC	0.03	0.06	1.9914	19.9145
CBGA	0.03	0.06	1.2507	12.5065
CBCA	0.03	0.06	0.5149	5.1488
CBDA	0.03	0.06	0.1713	1.7125
CBG	0.03	0.06	0.1584	1.5842
CBDVA	0.03	0.06	ND	ND
CBDV	0.03	0.06	ND	ND
CBD	0.03	0.06	ND	ND
THCV	0.03	0.06	ND	ND
CBCV	0.03	0.06	ND	ND
THCVA	0.03	0.06	ND	ND
CBN	0.03	0.06	ND	ND
CBCVA	0.03	0.06	ND	ND
D8-THC	0.03	0.06	ND	ND
CBC	0.03	0.06	ND	ND
<b>Total of all quantified cannabinoids:</b>			43.5854	435.8535

Visual Inspection/Olfactory	Result
Foreign Matter	None Detected

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

Authorized by:

  
Kintesh Sutaria  
QA Specialist

<b>Microbial Analysis</b>	LOD (CFU/g)	RL (CFU/g)	Result (CFU/g)	Status
Total Aerobic Count	12	500,000	< 12	PASS
Total Yeast and Mold Count	2	50,000	< 2	PASS
Salmonella			Absent in 25g	PASS
E.coli			Absent in 1g	PASS
Bile-Tolerant Gram-Negative	5	10,000	< 5	PASS

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## Details of Testing

### **Cannabinoid Analysis**

LAB-MTD-020: Determination of 16 Cannabinoids in Cannabis Flowers, Extracts, Topicals, Tablets and Isolates by HPLC

LAB-MTD-039: Determination of 11 Cannabinoids in Cannabis Edibles by HPLC

LAB-MTD-051: Assay of Cannabinoids in Cannabis Flower as per DAB by HPLC

LAB-MTD-052: Identification of CBD and THCA as per DAB by Thin-Layer Chromatography

### **Terpene Analysis**

LAB-MTD-044: Determination of Terpene Content in Cannabis Dried Flower, Fresh Flower and Extracts by GC-MS

### **Pesticide Analysis**

LAB-MTD-010: Determination of Health Canada Pesticide Residues and Toxins in Dried Cannabis Flower by LC-MS/MS and GC-MS/MS

LAB-MTD-040: Determination of EP 2.8.13 Pesticide Residues in Cannabis Extracts by GC-MS/MS

LAB-MTD-041: Determination of EP 2.8.13/USP 561 Pesticide Residues in Cannabis Flower by GC-MS/MS and LC-MS/MS

LAB-MTD-046: Determination of Health Canada Pesticides and Toxins in Cannabis Extracts by LC-MS/MS

LAB-MTD-048: Determination of Health Canada Pesticide Residues and Toxins in Fresh Cannabis Flower by LC-MS/MS and GC-MS/MS

LAB-MTD-055: Determination of Israel Pesticide Residues in Dried/Fresh Cannabis by LC-MS/MS and GC-MS/MS

### **Mycotoxin Analysis**

LAB-MTD-010: Determination of Health Canada Pesticide Residues and Toxins in Dried Cannabis Flower by LC-MS/MS and GC-MS/MS

LAB-MTD-029: Determination of Toxins in Tablet Samples by LC-MS/MS

LAB-MTD-037: Determination of Mycotoxins in Topical/Cream Samples by LC-MS/MS

LAB-MTD-046: Determination of Health Canada Pesticides and Toxins in Cannabis Extracts by LC-MS/MS

LAB-MTD-048: Determination of Health Canada Pesticide Residues and Toxins in Fresh Cannabis Flower by LC-MS/MS and GC-MS/MS

### **Flavonoid Analysis**

LAB-MTD-045: Determination of Flavonoids in Cannabis Dried Flower, Fresh Flower, and Extracts by LC-MS/MS

### **Peroxide Value, p-Anisidine and Acidity (FFA) Analysis**

LAB-MTD-049: Determination of Peroxide Value, p-Anisidine, and Acidity (FFA)

Information is accurate unless otherwise stated. The results of this report are reflective only to material and product analyzed as received. This report shall not be reproduced, without written approval from High North Laboratories. Test Results are confidential unless explicitly waived otherwise.

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# Details of Testing

## **Microbial Analysis**

MIC-MTD-001: Microbial Analysis of Cannabis Flower and Oil by qPCR  
MIC-MTD-006: Determination of Viruses in Cannabis via qPCR and ELISA  
MIC-MTD-007: Microbial Analysis of Cannabis by Culture Techniques  
MIC-MTD-009: Cannabis Gender Determination by qPCR  
MIC-MTD-010: Identification A and Identification B of Cannabis by DAB Monograph  
MIC-MTD-011: Analysis of Shigella Species in Cannabis and Cannabis Infused Products  
MIC-MTD-008: Analysis of Listeria Monocytogenes in Cannabis and Cannabis Infused Products  
MIC-MTD-012: Microbial Analysis of Cannabis and Cannabis Infused Products by TEMPO

## **Moisture Analysis**

LAB-MTD-017: Determination of Moisture Content in Cannabis Flower  
LAB-MTD-031: Water Activity Meter Setup and Operation  
LAB-MTD-053: Determination of Moisture Content by Loss on Drying Technique using Vacuum Oven  
LAB-MTD-056: Determination of Moisture Content by Karl Fischer Titration

## **Sample Appearance and Foreign Matter**

LAB-MTD-022: Sample Appearance and Detection of Foreign Matter Content in Cannabis Samples

## **Total Ash Analysis**

LAB-MTD-043: Total Ash by Muffle Furnace in Cannabis Products

## **Residual Solvents Analysis**

LAB-MTD-036: Determination of Residual Solvents in Cannabis Oil by GC-MS  
LAB-MTD-028: Determination of Residual Solvents in Tablet Samples by GC-MS  
LAB-MTD-034: Determination of Propane and Butane in Cannabis Oil by GC-MS  
LAB-MTD-038: Determination of Toluene in Cannabis Isolate by GC-MS  
LAB-MTD-054: Determination of Acetic Acid in Flavour, Cannabis Vape Mix Oil and Cannabis Infused Flower by GC-MS

## **Heavy Metal Analysis**

LAB-MTD-027: Determination of Heavy Metals in Cannabis Samples (Cream/Topicals, Tablets and Edibles) by ICP-MS  
LAB-MTD-050: Multi-Element Analysis of Cannabis Dried Flower, Fresh Flower, Extracts, and Rolling Papers by ICP-MS

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Kintesh Sutaria  
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# Certificate of Analysis



**CALA**  
Testing  
Accreditation No. A4106

**Les Entreprises  
Greentone**

cq@greentone.ca

**Valens Labs, c/o Valens Agritech**

230 Carion Rd  
Kelowna British Columbia  
Canada  
V4V 2K5

**Lab Sample ID** CAN-23090710-01  
**Client SID** 1E0627  
**Sample Type** Dried Flower - Cannabis

**Date Received** 2023-09-07  
**Date Published** 2023-09-19

## Methods Summary

**Microbials L-019** L-019-05 Analysis of Microbes in Cannabis by qPCR. Eu. Ph. 5.1.6, 2.6.12, 2.6.13 and 2.6.31 with limits as per Eu. Ph. 5.1.8. E. coli, Pseudomonas aeruginosa, Staphylococcus aureus, Listeria Monocytogenes, and Shigella are present/absent in 1 g or 1 mL. Salmonella is present/absent in 25 g or 25 mL.

**Microbials L-025** L-025-03 Analysis of Microbes in Cannabis by Plating. Eu. Ph. 5.1.6, 2.6.12, 2.6.13 and 2.6.31 with limits as per Eu. Ph. 5.1.8.

**Mycotoxins** L-018-04 Determination of Mycotoxins in Cannabis by LC-MS/MS. In house method developed utilizing interference removal cartridges. Limits as per Eu. Ph. 2.8.18 and 2.8.22. Sum of Alfatoxin B1, B2, G1 and G2 must be less than 4 ng/g. Ochratoxin A must be less than 20 ng/g.

**Metals** L-003-07 Determination of Heavy Metals in Cannabis by ICP-MS. Limits as per ICH Q3D limits for Inhalation Products.

**Pesticides (International)** L-035-02: In house methods utilizing QuEChERS cleanup and analysis with LC-MS/MS and GC-MS/MS.

**Loss on Drying** L-021-00 In-house method using a Mettler Toledo HE53 Halogen Moisture Analyzer.

**Moisture Content** L-031-00 Analysis of Water Content of Cannabis Products by coulometric Karl Fischer titration.

## Glossary of Terms

ND : Not Detected  
LOQ : Limit of Quantification  
LOD : Limit of Detection  
ppm : parts per million (micrograms per kilogram for dry weight basis)  
\* LOD and LOQ under review  
‡ Indicates result out of specification

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The results only relate to the items tested.  
As Valens Labs is not responsible for the sampling stage, the results apply to the sample as received.

Responsibilities:

Houssain El Arbi, Ph.D.  
Sr. Director, Valens Labs

Published By:

Aaron Wylie  
QA/QC Associate, Valens Labs

Page 1 of 10  
CAN-23090710-01

# Results

Microbials - Date Analyzed 2023-09-11		CFU/g	
Analyte	LOQ	Results	Limits
Bile Tolerant Gram-Negative	10	<LOQ	20
<i>E.coli</i>	10	<LOQ	20
<i>E.coli O157:H7</i>	N/A	Absent	
<i>Enterobacteriaceae</i>	10	<LOQ	20
<i>Pseudomonas aeruginosa</i>	N/A	Absent	
<i>Salmonella</i>	N/A	Absent	
<i>Staphylococcus aureus</i>	N/A	Absent	
Total Aerobic Count	100	<LOQ	20000
Total Yeast and Mould Count	100	<LOQ	2000

Mycotoxins - Date Analyzed 2023-09-11		ppb (ng/g)	
Analyte	LOQ	Results	Limits
Aflatoxin B1	0.5	<LOQ	2.0
Aflatoxin B2	1.0	<LOQ	
Aflatoxin G1	1.0	<LOQ	
Aflatoxin G2	1.0	<LOQ	
Ochratoxin A	1.0	<LOQ	2.0
Total Aflatoxins	N/A	<LOQ	4.0

Heavy Metals - Date Analyzed 2023-09-12		ppm (µg/g)	
Analyte	LOQ	Results	Limits
Zinc	0.25	49.30	
Arsenic	0.06	<LOQ	2.50
Cadmium	0.06	<LOQ	0.50
Lead	0.06	<LOQ	5.00
Mercury	0.06	<LOQ	0.10
Nickel	0.06	<LOQ	
Palladium	0.06	<LOQ	

Pesticides - Date Analyzed 2023-09-13		ppm (µg/g)	
Analyte	LOD	Results	Limits
<b>Not Detected</b>			
2,4-D	0.010	ND	0.010
Acephate	0.005	ND	0.010
Acequinocyl	0.010	ND	0.010
Acetamiprid	0.003	ND	0.010
Aclonifen	0.005	ND	0.010
Acrinathrin	0.010	ND	0.010
Alachlor	0.003	ND	0.010
Aldicarb	0.010	ND	0.010
Aldicarb sulfone	0.003	ND	0.010

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Page 2 of 10  
CAN-23090710-01

Pesticides - Date Analyzed 2023-09-13 ppm (µg/g)

Analyte	LOD	Results	Limits
Aldrin	0.003	ND	0.010
Allethrin	0.010	ND	0.010
Ametryn	0.003	ND	0.010
Amitraz	0.003	ND	0.010
Atrazine	0.005	ND	0.010
Avermectin B1a	0.003	ND	0.010
Avermectin B1b	0.010	ND	0.010
Azadirachtin	0.003	ND	0.010
Azinphos ethyl	0.005	ND	0.010
Azinphos methyl	0.005	ND	0.010
Azoxystrobin	0.002	ND	0.010
Benalaxyl	0.002	ND	0.010
Benfluralin	0.003	ND	0.010
Benfuracarb	0.005	ND	0.010
Bentazone	0.005	ND	0.010
Benzovindiflupyr	0.005	ND	0.010
Bifenazate	0.003	ND	0.010
Bifenthrin	0.003	ND	0.010
Bitertanol	0.005	ND	0.010
Boscalid	0.005	ND	0.010
Bromacil	0.005	ND	0.010
Bromide Ion	0.050	ND	0.010
Bromophos ethyl	0.005	ND	0.010
Bromophos methyl	0.005	ND	0.010
Bromopropylate	0.002	ND	0.010
Bromuconazole isomer 1	0.003	ND	0.010
Bromuconazole isomer 2	0.010	ND	0.010
Bupirimate	0.003	ND	0.010
Buprofezin	0.002	ND	0.010
Butylate	0.005	ND	0.010
Cadusafos	0.005	ND	0.010
Captan	0.010	ND	0.010
Carbaryl	0.005	ND	0.010
Carbendazim	0.003	ND	0.010
Carbofuran	0.002	ND	0.010
Carbofuran, 3-hydroxy	0.002	ND	0.010
Carbosulfan	0.002	ND	0.010
Carfentrazone ethyl	0.002	ND	0.010
Chlorantraniliprole	0.005	ND	0.010
Chlordane I	0.002	ND	0.010
Chlordane II	0.002	ND	0.010
Chlorfenapyr	0.005	ND	0.010
Chlorfenvinphos	0.002	ND	0.010
Chlorfluazuron	0.010	ND	0.010
Chlormequat chloride	0.005	ND	0.010

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Pesticides - Date Analyzed 2023-09-13 ppm (µg/g)

Analyte	LOD	Results	Limits
Chlorothalonil	0.010	ND	0.010
Chlorpropham	0.005	ND	0.010
Chlorpyrifos ethyl	0.005	ND	0.010
Chlorpyrifos methyl	0.010	ND	0.010
Chlorthal dimethyl	0.002	ND	0.010
Clethodim	0.005	ND	0.010
Clofentezine	0.005	ND	0.010
Clomazone	0.002	ND	0.010
Clopyralid	0.005	ND	0.010
Clothianidin	0.002	ND	0.010
Coumaphos	0.010	ND	0.010
Cyanophos	0.003	ND	0.010
Cyantraniliprole	0.003	ND	0.010
Cycloxydim	0.003	ND	0.010
Cyflufenamid	0.003	ND	0.010
Cyflumetofen	0.005	ND	0.010
Cyfluthrin isomer 1	0.010	ND	0.010
Cyfluthrin isomer 2	0.010	ND	0.010
Cyfluthrin isomer 3	0.010	ND	0.010
Cyhalothrin (Lambda and Gamma)	0.010	ND	0.010
Cyhexatin	0.010	ND	0.010
Cymoxanil	0.005	ND	0.010
Cypermethrin isomer 1	0.007	ND	0.010
Cypermethrin isomer 2	0.007	ND	0.010
Cypermethrin isomer 3	0.007	ND	0.010
Cyproconazole isomer 1	0.005	ND	0.010
Cyproconazole isomer 2	0.005	ND	0.010
Cyprodinil	0.010	ND	0.010
Cyromazine	0.005	ND	0.010
DDD, o,p'	0.002	ND	0.010
DDD, p,p'	0.002	ND	0.010
DDE, o,p'	0.002	ND	0.010
DDE, p,p'	0.002	ND	0.010
DDT, o,p'	0.002	ND	0.010
DDT, p,p'	0.002	ND	0.010
Deltamethrin	0.010	ND	0.010
Demeton-S-Methyl Sulfone	0.002	ND	0.010
Diafenthiuron	0.010	ND	0.010
Diazinon	0.005	ND	0.010
Dichlofluanid	0.010	ND	0.010
Dichlorvos	0.005	ND	0.010
Diclofop Methyl	0.002	ND	0.010
Dicofol	0.001	ND	0.010
Dieldrin	0.003	ND	0.010
Diethofencarb	0.005	ND	0.010

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Pesticides - Date Analyzed 2023-09-13 ppm (µg/g)

Analyte	LOD	Results	Limits
Difenoconazole	0.003	ND	0.010
Diflubenzuron	0.005	ND	0.010
Diflufenican	0.005	ND	0.010
Dimethenamid	0.002	ND	0.010
Dimethoate	0.002	ND	0.010
Dimethomorph isomer 1	0.003	ND	0.010
Dimethomorph isomer 2	0.003	ND	0.010
Dimethyl disulfide	0.010	ND	0.010
Diniconazole	0.003	ND	0.010
Dinotefuran	0.005	ND	0.010
Diphenylamine	0.005	ND	0.010
Dithianon	0.005	ND	0.010
Dithiocarbamates (Mancozeb-Maneb-Zineb)	0.003	ND	0.010
Dithiocarbamates (Propineb)	0.003	ND	0.010
Dithiocarbamates (Ziram-Thiuram)	0.003	ND	0.010
Diuron	0.003	ND	0.010
Dodemorph	0.003	ND	0.010
Dodine	0.005	ND	0.010
Emamectin benzoate B1a	0.005	ND	0.010
Emamectin benzoate B1b	0.005	ND	0.010
Endosulfan Sulfate	0.003	ND	0.010
Endosulfan-alpha	0.003	ND	0.010
Endosulfan-beta	0.003	ND	0.010
Endrin	0.003	ND	0.010
Endrin aldehyde	0.010	ND	0.010
Esfenvalerate	0.010	ND	0.010
Ethalfuralin	0.003	ND	0.010
Ethion	0.003	ND	0.010
Ethoprophos	0.003	ND	0.010
Ethoxyquin	0.005	ND	0.010
Etofenprox	0.005	ND	0.010
Etoxazole	0.003	ND	0.010
Etridiazole	0.003	ND	0.010
Etrimphos	0.010	ND	0.010
Famoxadone	0.010	ND	0.010
Fenamidone	0.002	ND	0.010
Fenamiphos	0.002	ND	0.010
Fenamiphos sulfone	0.002	ND	0.010
Fenamiphos sulfoxide	0.002	ND	0.010
Fenarimol	0.003	ND	0.010
Fenazaquin	0.005	ND	0.010
Fenbuconazole	0.003	ND	0.010
Fenbutatin oxide	0.010	ND	0.010
Fenchlorphos	0.003	ND	0.010
Fenchlorphos oxon	0.003	ND	0.010

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Pesticides - Date Analyzed 2023-09-13 ppm (µg/g)

Analyte	LOD	Results	Limits
Fenhexamid	0.005	ND	0.010
Fenitrothion	0.010	ND	0.010
Fenoxaprop-p-ethyl	0.005	ND	0.010
Fenoxycarb	0.003	ND	0.010
Fenpropathrin	0.010	ND	0.010
Fenpyrazamine	0.005	ND	0.010
Fenpyroximate	0.003	ND	0.010
Fensulfothion	0.003	ND	0.010
Fensulfothion oxon	0.003	ND	0.010
Fensulfothion oxon sulfone	0.003	ND	0.010
Fensulfothion sulfone	0.003	ND	0.010
Fenthion	0.005	ND	0.010
Fenthion oxon	0.003	ND	0.010
Fenthion oxon sulfone	0.003	ND	0.010
Fenthion oxon sulfoxide	0.003	ND	0.010
Fenthion sulfone	0.003	ND	0.010
Fenthion sulfoxide	0.003	ND	0.010
Fenvalerate	0.002	ND	0.010
Fipronil	0.003	ND	0.010
Flonicamid	0.003	ND	0.010
Fluazifop-P-butyl	0.003	ND	0.010
Fluazinam	0.005	ND	0.010
Flubendiamide	0.010	ND	0.010
Flucythrinate	0.005	ND	0.010
Fludioxonil	0.005	ND	0.010
Fluensulfone	0.010	ND	0.010
Flufenoxuron	0.003	ND	0.010
Fluopicolide	0.003	ND	0.010
Fluopyram	0.002	ND	0.010
Flurochloridone	0.002	ND	0.010
Fluroxypyr	0.010	ND	0.010
Fluroxypyr meptyl	0.010	ND	0.010
Flusilazole	0.003	ND	0.010
Flusulfamide	0.003	ND	0.010
Flutolanil	0.003	ND	0.010
Flutriafol	0.003	ND	0.010
Folpet	0.005	ND	0.010
Fonofos	0.010	ND	0.010
Formetanate HCl	0.002	ND	0.010
Fosetyl-Al	0.005	ND	0.010
Guazatine (component GG)	0.005	ND	0.010
Guazatine (component GGG)	0.005	ND	0.010
Guazatine (component GGN and GNG)	0.010	ND	0.010
Haloxypop-R-methyl	0.010	ND	0.010
HCH, alpha-	0.002	ND	0.010

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Aaron Wylie  
QA/QC Associate, Valens Labs

Pesticides - Date Analyzed 2023-09-13 ppm (µg/g)

Analyte	LOD	Results	Limits
HCH, beta-	0.002	ND	0.010
HCH, delta-	0.002	ND	0.010
HCH, epsilon-	0.002	ND	0.010
HCH, gamma (Lindane)	0.002	ND	0.010
Heptachlor	0.002	ND	0.010
Heptachlor epoxide (cis and trans)	0.003	ND	0.010
Hexachlorobenzene	0.003	ND	0.010
Imazalil	0.003	ND	0.010
Imazamox	0.003	ND	0.010
Imazapyr	0.003	ND	0.010
Imidacloprid	0.002	ND	0.010
Indoxacarb	0.002	ND	0.010
Iprodione	0.010	ND	0.010
Iprovalicarb	0.005	ND	0.010
Kinoprene	0.005	ND	0.010
Kresoxim methyl	0.010	ND	0.010
Linuron	0.005	ND	0.010
Lufenuron	0.003	ND	0.010
Malaoxon	0.002	ND	0.010
Malathion	0.005	ND	0.010
Mandipropamid	0.003	ND	0.010
Mecarbam	0.003	ND	0.010
Mepanipyrim	0.005	ND	0.010
Meptyldinocap	0.005	ND	0.010
Metaflumizone	0.005	ND	0.010
Metalaxyl-M	0.002	ND	0.010
Metam sodium	0.050	ND	0.010
Metamitron	0.003	ND	0.010
Metconazole (cis)	0.005	ND	0.010
Metconazole (trans)	0.010	ND	0.010
Methacrifos	0.003	ND	0.010
Methamidophos	0.003	ND	0.010
Methidathion	0.005	ND	0.010
Methiocarb	0.003	ND	0.010
Methiocarb sulfone	0.002	ND	0.010
Methiocarb sulfoxide	0.002	ND	0.010
Methomyl	0.003	ND	0.010
Methoprene	0.005	ND	0.010
Methoxychlor	0.003	ND	0.010
Methoxyfenozide	0.010	ND	0.010
Metolachlor-S	0.003	ND	0.010
Metominostrobin	0.003	ND	0.010
Metribuzin	0.002	ND	0.010
Mevinphos isomer 1	0.003	ND	0.010
Mevinphos isomer 2	0.003	ND	0.010

Responsibilities:



Houssain El Aribi, Ph.D.  
Sr. Director, Valens Labs

Published By:



Aaron Wylie  
QA/QC Associate, Valens Labs

Pesticides - Date Analyzed 2023-09-13 ppm (µg/g)

Analyte	LOD	Results	Limits
MGK-264 isomer 1	0.005	ND	0.010
MGK-264 isomer 2	0.005	ND	0.010
Milbemectin (sum of A3 and A4)	0.010	ND	0.010
Mirex	0.002	ND	0.010
Monocrotophos	0.002	ND	0.010
Myclobutanil	0.003	ND	0.010
Naled	0.005	ND	0.010
Novaluron	0.003	ND	0.010
Omethoate	0.002	ND	0.010
Ortho phenylphenol	0.005	ND	0.010
Oxadiargyl	0.010	ND	0.010
Oxadiazon	0.005	ND	0.010
Oxamyl	0.005	ND	0.010
Oxathiapiprolin	0.002	ND	0.010
Oxychlorane	0.003	ND	0.010
Oxydemeton methyl	0.003	ND	0.010
Oxyfluorfen	0.003	ND	0.010
Pacllobutrazol	0.003	ND	0.010
Paraoxon ethyl (Paraoxon)	0.003	ND	0.010
Paraoxon methyl	0.005	ND	0.010
Parathion ethyl (Parathion)	0.003	ND	0.010
Parathion Methyl	0.005	ND	0.010
Penconazole	0.005	ND	0.010
Pencycuron	0.010	ND	0.010
Pendimethalin	0.010	ND	0.010
Pentachloroaniline	0.010	ND	0.010
Pentachloroanisole	0.003	ND	0.010
Pentachlorothioanisole	0.003	ND	0.010
Penthiopyrad	0.003	ND	0.010
Permethrins (2 isomers)	0.010	ND	0.010
Phenothrin	0.005	ND	0.010
Phosalone	0.005	ND	0.010
Phosmet	0.005	ND	0.010
Phosmet oxon	0.002	ND	0.010
Picoxystrobin	0.005	ND	0.010
Piperonyl butoxide	0.005	ND	0.010
Pirimicarb	0.002	ND	0.010
Pirimicarb desmethyl	0.002	ND	0.010
Pirimiphos ethyl	0.003	ND	0.010
Pirimiphos methyl	0.003	ND	0.010
Pirimiphos methyl N-desethyl	0.003	ND	0.010
Prallethrin	0.010	ND	0.010
Prochloraz	0.005	ND	0.010
Procymidone	0.002	ND	0.010
Profenofos	0.005	ND	0.010

Responsibilities:



Houssain El Aribi, Ph.D.  
Sr. Director, Valens Labs

Published By:



Aaron Wylie  
QA/QC Associate, Valens Labs

Pesticides - Date Analyzed 2023-09-13 ppm (µg/g)

Analyte	LOD	Results	Limits
Prometryn	0.003	ND	0.010
Propamocarb HCl	0.003	ND	0.010
Propaquizafop	0.010	ND	0.010
Propargite	0.010	ND	0.010
Propiconazole	0.005	ND	0.010
Propoxur	0.005	ND	0.010
Propyzamide	0.003	ND	0.010
Proquinazid	0.010	ND	0.010
Prothioconazole	0.005	ND	0.010
Prothiofos	0.005	ND	0.010
Pymetrozine	0.005	ND	0.010
Pyraclostrobin	0.003	ND	0.010
Pyraflufen ethyl	0.005	ND	0.010
Pyrethrum (cinerin I and II)	0.005	ND	0.010
Pyrethrum (jasmolin I and II)	0.010	ND	0.010
Pyrethrum (pyrethrin I and II)	0.010	ND	0.010
Pyridaben	0.005	ND	0.010
Pyridalyl	0.005	ND	0.010
Pyrimethanil	0.010	ND	0.010
Pyrimidifen	0.003	ND	0.010
Pyriofenone	0.003	ND	0.010
Pyriproxyfen	0.003	ND	0.010
Quinalphos	0.010	ND	0.010
Quinoxifen	0.005	ND	0.010
Quintozene	0.005	ND	0.010
Quizalofop-P	0.010	ND	0.010
Quizalofop-P-ethyl	0.005	ND	0.010
Resmethrin	0.010	ND	0.010
Rimsulfuron	0.002	ND	0.010
S-421	0.003	ND	0.010
Simazine	0.003	ND	0.010
Spinetoram J	0.003	ND	0.010
Spinetoram L	0.003	ND	0.010
Spinosyn A	0.005	ND	0.010
Spinosyn D	0.005	ND	0.010
Spirodiclofen	0.010	ND	0.010
Spiromesifen	0.010	ND	0.010
Spirotetramat	0.005	ND	0.010
Spiroxamine	0.003	ND	0.010
Sulfotep	0.005	ND	0.010
Sulfoxaflor isomer 1	0.010	ND	0.010
Sulfoxaflor isomer 2	0.010	ND	0.010
tau-Fluvalinate	0.010	ND	0.010
Tebuconazole	0.005	ND	0.010
Tebufenpyrad	0.005	ND	0.010

Responsibilities:



Houssain El Aribi, Ph.D.  
Sr. Director, Valens Labs

Published By:



Aaron Wylie  
QA/QC Associate, Valens Labs

Pesticides - Date Analyzed 2023-09-13		ppm (µg/g)	
Analyte	LOD	Results	Limits
Tecnazene	0.002	ND	0.010
Teflubenzuron	0.010	ND	0.010
Terbacil	0.003	ND	0.010
Terbutryn	0.003	ND	0.010
Tetrachlorvinphos	0.005	ND	0.010
Tetraconazole	0.003	ND	0.010
Tetradifon	0.005	ND	0.010
Thiabendazole	0.005	ND	0.010
Thiaclopid	0.001	ND	0.010
Thiamethoxam	0.002	ND	0.010
Thiocyclam hydrogenoxalate	0.010	ND	0.010
Thiodicarb	0.003	ND	0.010
Thiophanate methyl	0.002	ND	0.010
Tolclofos methyl	0.010	ND	0.010
Tolfenpyrad	0.003	ND	0.010
Triadimefon	0.003	ND	0.010
Triadimenol	0.003	ND	0.010
Triasulfuron	0.002	ND	0.010
Tribenuron methyl	0.002	ND	0.010
Tridemorph	0.005	ND	0.010
Trifloxystrobin	0.003	ND	0.010
Triflumuron	0.005	ND	0.010
Trifluralin	0.002	ND	0.010
Uniconazole	0.005	ND	0.010
Vinclozolin	0.002	ND	0.010
Zoxamide	0.005	ND	0.010

Loss on Drying - Date Analyzed 2023-09-08		%
Analyte	Results	
Loss on Drying	12.59	
Moisture Content	8.08	

Responsibilities:



Houssain El Aribi, Ph.D.  
Sr. Director, Valens Labs

Published By:



Aaron Wylie  
QA/QC Associate, Valens Labs

HIGH NORTH ID:  
00394358  
Date: 2023-10-24  
Certificate: 1698158332



High North Inc.  
241 Hanlan Rd, Unit 7  
Woodbridge, ON, L4L 3R7  
1-416-864-6119  
LIC-P4PNJMAC20-2022

Client: Apollo Green Inc.  
400 Commerce Street,  
Vars, ON, K0A 3H0  
Name: Cory Beard  
6136180362  
Cory.beard@apollogreen.com  
Product: GMO Zkittles #2  
Lot: GMO002-H  
Matrix: Oil  
Sub-matrix: Hash  
Sampled: 2023-10-16  
Received: 2023-10-18

## Certificate of Analysis

<b>Cannabinoid Analysis</b>	LOD (%)	LOQ (%)	wt%	mg/g
Total THC [(THCA x 0.877) + D9-THC]			62.1634	621.6339
Total CBD [(CBDA x 0.877) + CBD]			BLQ	BLQ
THCA-A	0.02	0.6	64.8758	648.7577
D9-THC	0.02	0.6	5.2673	52.6734
CBGA	0.02	0.6	1.6239	16.2393
CBG	0.02	0.6	BLQ	BLQ
CBDA	0.02	0.6	BLQ	BLQ
CBC	0.02	0.6	ND	ND
D8-THC	0.02	0.6	ND	ND
CBN	0.02	0.6	ND	ND
THCV	0.02	0.6	ND	ND
CBD	0.02	0.6	ND	ND
CBDV	0.02	0.6	ND	ND
<b>Total of all quantified cannabinoids:</b>			71.7670	717.6704

<b>Terpene Analysis</b>	LOD (%)	LOQ (%)	wt%
Trans-Caryophyllene	0.0008	0.025	1.7830
Farnesene*	0.0055	0.050	1.3714
Alpha-Humulene	0.0005	0.025	0.5180
Alpha-Bisabolol	0.0008	0.025	0.2795
(R)-(+)-Limonene	0.0007	0.025	0.2316
Linalool	0.0007	0.025	0.1815
Alpha-Terpeneol	0.0008	0.025	0.1780
(R)-Endo-(+)-Fenchyl Alcohol	0.0010	0.025	0.1430
Alpha-Pinene	0.0007	0.025	0.0968
Beta-Pinene	0.0008	0.025	0.0891
Beta-Myrcene	0.0005	0.025	0.0889

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

Authorized by:

  
Gui Scharlack  
QA Specialist

<b>Terpene Analysis</b>	LOD (%)	LOQ (%)	wt%
Caryophyllene oxide	0.0007	0.025	0.0719
Camphene	0.0017	0.025	0.0272
Borneol	0.0007	0.025	BLQ
Fenchone	0.0008	0.025	BLQ
Squalene	0.0029	0.050	ND
Phytol*	0.0018	0.050	ND
Nootkatone	0.0018	0.025	ND
Farnesol*	0.0016	0.050	ND
Phytane	0.0009	0.025	ND
(+)-Cedrol	0.0006	0.025	ND
Guaiol	0.0005	0.025	ND
trans-Nerolidol	0.0006	0.025	ND
cis-Nerolidol	0.0015	0.025	ND
Valencene	0.0005	0.025	ND
Eugenol	0.0023	0.025	ND
Alpha-Cedrene	0.0006	0.025	ND
Geranyl acetate	0.0009	0.025	ND
Carvacrol	0.0009	0.025	ND
Thymol	0.0012	0.025	ND
d-Valerolactam (2-piperidone)	0.0012	0.025	ND
(-)-Piperitone	0.0017	0.025	ND
Isobornyl Acetate	0.0018	0.025	ND
Carvone	0.0007	0.025	ND
Pulegone	0.0007	0.025	ND
Verbenone	0.0007	0.025	ND
Citral*	0.0021	0.025	ND
Geraniol	0.0007	0.025	ND
Safranal	0.0004	0.025	ND
Nerol	0.0010	0.025	ND
Citronellol	0.0008	0.025	ND
Octyl Acetate	0.0009	0.025	ND
Terpinen-4-ol	0.0010	0.025	ND
Camphor	0.0008	0.025	ND
Isoborneol	0.0006	0.025	ND
Menthol (Hexahydrothymol)	0.0010	0.025	ND
Menthone*	0.0007	0.025	ND
Isopulegol	0.0007	0.025	ND
Alpha-Thujone	0.0005	0.025	ND
Terpinolene	0.0008	0.025	ND
Sabinene Hydrate	0.0010	0.025	ND
Gamma-Terpinene	0.0007	0.025	ND
Eucalyptol	0.0006	0.025	ND
Cymene*	0.0006	0.025	ND

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

Authorized by:



Gui Scharlack  
QA Specialist



<b>Terpene Analysis</b>	LOD (%)	LOQ (%)	wt%
Ocimene	0.0005	0.025	ND
Alpha-Terpinene	0.0004	0.025	ND
Alpha-Phellandrene	0.0010	0.025	ND
(1S)-3-Carene	0.0009	0.025	ND
Sabinene	0.0009	0.025	ND
<b>Total of all quantified terpenes:</b>			5.060

<b>Water Activity Analysis</b>	Result
Water Activity	0.5428aw

<b>Mycotoxin Analysis</b>	LOD (ppb)	LOQ (ppb)	RL (ppb)	Result (ppb)	Status
Aflatoxin-B1	0.4000	2	2	ND	PASS
Aflatoxin-B2	0.4000	2		ND	
Aflatoxin-G1	0.3000	2		ND	
Aflatoxin-G2	0.5000	2		ND	
<b>Sum of Aflatoxins:</b>			4	0	PASS
Ochratoxin-A	1.7000	20	20	ND	PASS

<b>Microbial Analysis</b>	LOD (CFU/g)	RL (CFU/g)	Result (CFU/g)	Status
Total Aerobic Count	12	500,000	< 12	PASS
Total Yeast and Mold Count	2	50,000	< 2	PASS
S.aureus/P.aeruginosa			Absent in 1g	PASS
Salmonella			Absent in 25g	PASS
E.coli			Absent in 1g	PASS
Bile-Tolerant Gram-Negative	5	10,000	< 5	PASS

<b>Heavy Metals Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
Arsenic	0.067	0.2	0.2	ND	PASS
Cadmium	0.008	0.05	0.3	ND	PASS
Lead	0.010	0.50	0.5	BLQ	PASS
Mercury	0.003	0.05	0.1	ND	PASS

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

Authorized by:



Gui Scharlack  
QA Specialist

<b>Residual Solvents Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
1-Butanol	136.46	1000	5000	ND	PASS
1-Pentanol	102.40	1000	5000	ND	PASS
1-Propanol	199.71	1000	5000	ND	PASS
2-Butanol	48.38	1000	5000	ND	PASS
2-Methyl-1-propanol	153.28	1000	5000	ND	PASS
2-Propanol	142.60	1000	5000	ND	PASS
3-Methyl-1-butanol	64.03	1000	5000	ND	PASS
Acetone	81.47	1000	5000	ND	PASS
Anisole	54.77	1000	5000	ND	PASS
Butyl acetate	40.51	1000	5000	ND	PASS
Dimethyl sulfoxide	96.05	1000	5000	ND	PASS
Ethanol	179.88	1000	5000	ND	PASS
Ethyl acetate	89.17	1000	5000	ND	PASS
Ethyl ether	105.42	1000	5000	ND	PASS
Ethyl formate	194.93	1000	5000	ND	PASS
Heptane	109.56	1000	5000	ND	PASS
Isobutyl acetate	48.49	1000	5000	ND	PASS
Isopropyl acetate	118.80	1000	5000	ND	PASS
Methyl acetate	87.65	1000	5000	ND	PASS
Methylethyl ketone	97.35	1000	5000	ND	PASS
Pentane	102.77	1000	5000	ND	PASS
Propyl acetate	58.63	1000	5000	ND	PASS
Tert-Butylmethyl ether	115.57	1000	5000	ND	PASS
Triethylamine	22.07	1000	5000	ND	PASS

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

Authorized by:



Gui Scharlack  
QA Specialist

<b>Pesticides Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
Abamectin	0.0218	0.25	0.25	ND	PASS
Acephate	0.0022	0.05	0.05	ND	PASS
Acequinocyl	0.0047	0.05	0.05	ND	PASS
Acetamiprid	0.0028	0.10	0.10	ND	PASS
Aldicarb	0.0796	1.00	1.00	ND	PASS
Allethrin	0.0365	0.20	0.20	ND	PASS
Azadirachtin	0.0149	1.00	1.00	ND	PASS
Azoxystrobin	0.0008	0.02	0.02	ND	PASS
Benzovindiflupyr	0.0018	0.02	0.02	ND	PASS
Bifenazate	0.0009	0.05	0.05	ND	PASS
Bifenthrin	0.0369	1.00	1.00	ND	PASS
Boscalid	0.0011	0.02	0.02	ND	PASS
Buprofezin	0.0012	0.02	0.02	ND	PASS
Carbaryl	0.0014	0.05	0.05	ND	PASS
Carbofuran	0.0010	0.02	0.02	ND	PASS
Chlorantraniliprole	0.0017	0.02	0.02	ND	PASS
Chlorfenapyr	0.7181	1.50	1.50	ND	PASS
Chlorpyrifos	0.0724	0.50	0.50	ND	PASS
Clofentezine	0.0016	0.02	0.02	ND	PASS
Clothianidin	0.0020	0.05	0.05	ND	PASS
Coumaphos	0.0021	0.02	0.02	ND	PASS
Cyantraniliprole	0.0024	0.02	0.02	ND	PASS
Cyfluthrin	0.1386	1.00	1.00	ND	PASS
Cypermethrin	0.1288	1.00	1.00	ND	PASS
Cyprodinil	0.0014	0.25	0.25	ND	PASS
Daminozide	0.0056	0.10	0.10	ND	PASS
Deltamethrin	0.0547	1.00	1.00	ND	PASS
Diazinon	0.0019	0.02	0.02	ND	PASS
Dichlorvos	0.0115	0.10	0.10	ND	PASS
Dimethoate	0.0008	0.02	0.02	ND	PASS
Dimethomorph	0.0011	0.05	0.05	ND	PASS
Dinotefuran	0.0029	0.10	0.10	ND	PASS
Dodemorph	0.0029	0.05	0.05	ND	PASS
Endosulfan-alpha	0.7470	2.50	2.50	ND	PASS
Endosulfan-beta	0.5482	2.50	2.50	ND	PASS
Endosulfan sulfate	0.2185	2.50	2.50	ND	PASS
Ethoprophos	0.0011	0.02	0.02	ND	PASS
Etofenprox	0.0021	0.05	0.05	ND	PASS
Etoxazole	0.0011	0.02	0.02	ND	PASS
Etridiazole	0.0215	0.15	0.15	ND	PASS
Fenoxycarb	0.0012	0.02	0.02	ND	PASS
Fenpyroximate	0.0019	0.02	0.02	ND	PASS
Fensulfothion	0.0009	0.02	0.02	ND	PASS

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

Authorized by:



Gui Scharlack  
QA Specialist

<b>Pesticides Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
Fenthion	0.0021	0.02	0.02	ND	PASS
Fenvalerate	0.0144	0.10	0.10	ND	PASS
Fipronil	0.0015	0.06	0.06	ND	PASS
Flonicamid	0.0046	0.05	0.05	ND	PASS
Fludioxonil	0.0015	0.02	0.02	ND	PASS
Fluopyram	0.0006	0.02	0.02	ND	PASS
Hexythiazox	0.0012	0.01	0.01	ND	PASS
Imazalil	0.0025	0.05	0.05	ND	PASS
Imidacloprid	0.0010	0.02	0.02	ND	PASS
Iprodione	0.0607	1.00	1.00	ND	PASS
Kinoprene	0.1272	1.25	1.25	ND	PASS
Kresoxim-methyl	0.0111	0.15	0.15	ND	PASS
Malathion	0.0009	0.02	0.02	ND	PASS
Metalaxyl	0.0006	0.02	0.02	ND	PASS
Methiocarb	0.0010	0.02	0.02	ND	PASS
Methomyl	0.0012	0.05	0.05	ND	PASS
Methoprene	0.1356	2.00	2.00	ND	PASS
Mevinphos	0.0016	0.05	0.05	ND	PASS
MGK-264	0.0039	0.05	0.05	ND	PASS
Myclobutanil	0.0016	0.02	0.02	ND	PASS
Naled	0.0163	0.20	0.20	ND	PASS
Novaluron	0.0042	0.05	0.05	ND	PASS
Oxamyl	0.0456	3.00	3.00	ND	PASS
Paclobutrazol	0.0014	0.02	0.02	ND	PASS
Parathion-methyl	0.0050	0.05	0.05	ND	PASS
Permethrin	0.0192	0.50	0.50	ND	PASS
Phenothrin	0.0057	0.05	0.05	ND	PASS
Phosmet	0.0020	0.02	0.02	ND	PASS
Piperonyl butoxide	0.2722	1.25	1.25	ND	PASS
Pirimicarb	0.0005	0.02	0.02	ND	PASS
Prallethrin	0.0087	0.05	0.05	ND	PASS
Propiconazole	0.0073	0.10	0.10	ND	PASS
Propoxur	0.0019	0.02	0.02	ND	PASS
Pyraclostrobin	0.0006	0.02	0.02	ND	PASS
Pyrethrins	0.0028	0.05	0.05	ND	PASS
Pyridaben	0.0012	0.05	0.05	ND	PASS
Quintozene	0.0065	0.02	0.02	ND	PASS
Resmethrin	0.0028	0.10	0.10	ND	PASS
Spinetoram	0.0014	0.02	0.02	ND	PASS
Spinosad	0.0013	0.10	0.10	ND	PASS
Spirodiclofen	0.0128	0.25	0.25	ND	PASS
Spiromesifen	0.5285	3.00	3.00	ND	PASS
Spirotetramat	0.0012	0.10	0.10	ND	PASS

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

Authorized by:

  
 Gui Scharlack  
 QA Specialist

<b>Pesticides Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
Spiroxamine	0.0018	0.10	0.10	ND	PASS
Tebuconazole	0.0022	0.05	0.05	ND	PASS
Tebufenozide	0.0007	0.02	0.02	ND	PASS
Teflubenzuron	0.0049	0.05	0.05	ND	PASS
Tetrachlorvinphos	0.0011	0.02	0.02	ND	PASS
Tetramethrin	0.0057	0.10	0.10	ND	PASS
Thiacloprid	0.0009	0.02	0.02	ND	PASS
Thiamethoxam	0.0011	0.02	0.02	ND	PASS
Thiophanate-methyl	0.0031	0.05	0.05	ND	PASS
Trifloxystrobin	0.0006	0.02	0.02	ND	PASS

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Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

Authorized by:



Gui Scharlack  
QA Specialist

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## Details of Testing

### **Cannabinoid Analysis**

LAB-MTD-020: Determination of 11 Cannabinoids in Cannabis Flower (LOQ 0.06%), Fresh Flower (LOQ 0.015%), Oil (LOQ 0.03%) and Concentrates (LOQ 0.6%) by HPLC and UHPLC

LAB-MTD-021: Determination of Cannabinoids of Individually Isolated Sample by HPLC/UHPLC

LAB-MTD-023: Determination of 11 Cannabinoids in Cannabis Tablets and Granules (LOQ 0.025%) by HPLC/UHPLC

LAB-MTD-030: Determination of 11 Cannabinoids in Cannabis Topicals (LOQ 0.005%) by HPLC/UHPLC

LAB-MTD-039: Determination of 11 Cannabinoids in Cannabis Edibles; Liquid Edibles (LOQ 0.0005%) and Solid Edibles (LOQ 0.005%) by HPLC

LAB-MTD-051: Assay of Cannabinoids in Cannabis Flower as per DAB by HPLC

LAB-MTD-052: Identification of CBD and THCA as per DAB by Thin-Layer Chromatography

### **Terpene Analysis**

LAB-MTD-044: Determination of Terpene Content in Cannabis Dried Flower, Fresh Flower and Extracts by GC-MS

### **Pesticide Analysis**

LAB-MTD-010: Determination of Health Canada Pesticide Residues and Toxins in Dried Cannabis Flower by LC-MS/MS and GC-MS/MS

LAB-MTD-040: Determination of EP Pesticide Residues in Cannabis Oil and Related Products by GC-MS/MS

LAB-MTD-041: Determination of EP Pesticide Residues in Cannabis Flower and Related Products by GC-MS/MS

LAB-MTD-046: Determination of Health Canada Pesticides and Toxins in Cannabis Extracts by LC-MS/MS

LAB-MTD-048: Determination of Health Canada Pesticide Residues and Toxins in Fresh Cannabis Flower by LC-MS/MS and GC-MS/MS

LAB-MTD-055: Determination of Israel Pesticide Residues in Dried/Fresh Cannabis by LC-MS/MS and GC-MS/MS

### **Mycotoxin Analysis**

LAB-MTD-010: Determination of Health Canada Pesticide Residues and Toxins in Dried Cannabis Flower by LC-MS/MS and GC-MS/MS

LAB-MTD-029: Determination of Toxins in Tablet Samples by LC-MS/MS

LAB-MTD-037: Determination of Mycotoxins in Topical/Cream Samples by LC-MS/MS

LAB-MTD-046: Determination of Health Canada Pesticides and Toxins in Cannabis Extracts by LC-MS/MS

LAB-MTD-048: Determination of Health Canada Pesticide Residues and Toxins in Fresh Cannabis Flower by LC-MS/MS and GC-MS/MS

### **Flavonoid Analysis**

LAB-MTD-045: Determination of Flavonoids in Cannabis Dried Flower, Fresh Flower, and Extracts by LC-MS/MS

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Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

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Gui Scharlack  
QA Specialist

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# Details of Testing

## **Microbial Analysis**

MIC-MTD-001: Microbial Analysis of Cannabis Flower and Oil by qPCR  
MIC-MTD-006: Determination of Viruses in Cannabis via qPCR and ELISA  
MIC-MTD-007: Microbial Analysis of Cannabis by Culture Techniques  
MIC-MTD-009: Cannabis Gender Determination by qPCR  
MIC-MTD-010: Identification A and Identification B of Cannabis by DAB Monograph  
MIC-MTD-011: Analysis of Shigella Species in Cannabis and Cannabis Infused Products  
MIC-MTD-008: Analysis of Listeria Monocytogenes in Cannabis and Cannabis Infused Products

## **Moisture Analysis**

LAB-MTD-017: Determination of Moisture Content in Cannabis Flower  
LAB-MTD-031: Water Activity Meter Setup and Operation  
LAB-MTD-053: Determination of Moisture Content by Loss on Drying Technique using Vacuum Oven  
LAB-MTD-056: Determination of Moisture Content by Karl Fischer Titration

## **Sample Appearance and Foreign Matter**

LAB-MTD-022: Sample Appearance and Detection of Foreign Matter Content in Cannabis Samples

## **Total Ash Analysis**

LAB-MTD-043: Total Ash by Muffle Furnace in Cannabis Products

## **Residual Solvents Analysis**

LAB-MTD-036: Determination of Residual Solvents in Cannabis Oil by GC-MS  
LAB-MTD-028: Determination of Residual Solvents in Tablet Samples by GC-MS  
LAB-MTD-034: Determination of Propane and Butane in Cannabis Oil by GC-MS  
LAB-MTD-038: Determination of Toluene in Cannabis Isolate by GC-MS  
LAB-MTD-054: Determination of Acetic Acid in Flavour, Cannabis Vape Mix Oil and Cannabis Infused Flower by GC-MS

## **Peroxide Value, p-Anisidine and Acidity (FFA) Analysis**

LAB-MTD-049: Determination of Peroxide Value, p-Anisidine, and Acidity (FFA)

## **Heavy Metal Analysis**

LAB-MTD-027: Determination of Heavy Metals in Cannabis Samples (Cream/Topicals, Tablets and Edibles) by ICP-MS  
LAB-MTD-050: Multi-Element Analysis of Cannabis Dried Flower, Fresh Flower, Extracts, and Rolling Papers by ICP-MS

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HIGH NORTH ID:  
00258675  
Date: 2022-11-04  
Certificate: 1667596333



High North Inc.  
241 Hanlan Rd, Unit 7  
Woodbridge, ON, L4L 3R7  
1-416-864-6119  
LIC-P4PNJMAC20-2022

Client: Apollo Green Inc.  
400 Commerce Street,  
Vars, ON, K0A 3H0  
Name: Cory Beard  
6136180362  
Cory.beard@apollogreen.com  
Strain: OG Kush Breath  
Lot: ODG003-H  
Matrix: Oil  
Sub-matrix: Hash  
Sampled: 2022-10-27  
Received: 2022-10-28

## Certificate of Analysis

<b>Cannabinoid Analysis</b>	LOD (%)	LOQ (%)	wt%	mg/g
Total THC [(THCA x 0.877) + D9-THC]			61.314	613.136
Total CBD [(CBDA x 0.877) + CBD]			0	0
THCA-A	0.004	0.03	68.131	681.311
CBGA	0.007	0.03	2.375	23.753
D9-THC	0.0086	0.03	1.563	15.626
CBG	0.0028	0.03	BLQ	BLQ
CBC	0.0092	0.03	ND	ND
D8-THC	0.0074	0.03	ND	ND
CBN	0.0069	0.03	ND	ND
THCV	0.0068	0.03	ND	ND
CBD	0.0081	0.03	ND	ND
CBDA	0.008	0.03	ND	ND
CBDV	0.0073	0.03	ND	ND
<b>Total of all quantified cannabinoids:</b>			72.069	720.690

<b>Terpene Analysis</b>	LOD (%)	LOQ (%)	wt%
Terpinolene	0.0018	0.025	0.474
Trans-Caryophyllene	0.0016	0.025	0.439
Alpha-Pinene	0.0013	0.025	0.277
Farnesene*	0.0021	0.025	0.244
Beta-Pinene	0.0016	0.025	0.244
(R)-(+)-Limonene	0.0023	0.025	0.224
Terpineol*	0.0013	0.025	0.209
Alpha-Humulene	0.0017	0.025	0.155
Linalool	0.0014	0.025	0.15
(R)-Endo-(+)-Fenchyl	0.0013	0.025	0.12
Beta-Myrcene	0.0012	0.025	0.103

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

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<b>Terpene Analysis</b>	LOD (%)	LOQ (%)	wt%
(1S)-3-Carene	0.0020	0.025	0.075
Alpha-Phellandrene	0.0018	0.025	0.048
Ocimene*	0.0030	0.025	0.047
Caryophyllene oxide	0.0023	0.025	0.045
Gamma-Terpinene	0.0014	0.025	0.042
Alpha-Terpinene	0.0021	0.025	0.036
Sabinene	0.0017	0.025	0.027
Eucalyptol	0.0028	0.025	BLQ
Camphene	0.0019	0.025	BLQ
Geraniol	0.0020	0.025	BLQ
trans-Nerolidol	0.0025	0.025	BLQ
Citronellol	0.0014	0.025	BLQ
Fenchone*	0.0014	0.025	BLQ
Phytol*	0.0028	0.050	ND
alpha-Bisabolol	0.0022	0.025	ND
(+)-Cedrol	0.0023	0.025	ND
Guaiol	0.0016	0.025	ND
cis-Nerolidol	0.0028	0.025	ND
Valencene	0.0015	0.025	ND
Eugenol	0.0019	0.025	ND
Alpha-Cedrene	0.0016	0.025	ND
Geranyl acetate	0.0015	0.025	ND
Pulegone	0.0011	0.025	ND
Nerol	0.0023	0.025	ND
Camphor + Borneol*	0.0013	0.050	ND
Isoborneol	0.0013	0.025	ND
Hexahydrothymol	0.0020	0.025	ND
Isopulegol	0.0011	0.025	ND
Sabinene Hydrate	0.0011	0.025	ND
p-Cymene	0.0010	0.025	ND
<b>Total of all quantified terpenes:</b>			<b>2.959</b>

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

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<b>Mycotoxin Analysis</b>	LOD (ppb)	LOQ (ppb)	RL (ppb)	Result (ppb)	
Aflatoxin-B1	0.9	2	2	ND	PASS
Aflatoxin-B2	0.8	2		ND	PASS
Aflatoxin-G1	0.9	2		ND	PASS
Aflatoxin-G2	0.8	2		ND	PASS
<b>Sum of Aflatoxins:</b>			4	0	PASS
Ochratoxin-A	9.4	20	20	ND	PASS

<b>Microbial Analysis</b>	LOD (CFU/g)	RL (CFU/g)	Result (CFU/g)	Status
Total Aerobic Count	12	500,000	774	PASS
Bile-Tolerant Gram-Negative	5	10,000	ND	PASS
Total Yeast and Mold Count	1.8	50,000	ND	PASS
S.aureus/P.aeruginosa			Absent in 1g	PASS
Salmonella			Absent in 25g	PASS
E.coli			Absent in 1g	PASS

<b>Heavy Metals Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
Arsenic	0.05	0.2	0.2	ND	PASS
Cadmium	0.01	0.05	0.3	BLQ	PASS
Lead	0.02	0.5	0.5	ND	PASS
Mercury	0.01	0.05	0.1	ND	PASS

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

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<b>Residual Solvents Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
1-Butanol	22.7	1000	5,000	ND	PASS
1-Pentanol	28.9	1000	5,000	ND	PASS
1-Propanol	44.6	1000	5,000	ND	PASS
2-Butanol	20.1	1000	5,000	ND	PASS
2-Methyl-1-propanol	11.6	1000	5,000	ND	PASS
2-Propanol	13.3	1000	5,000	ND	PASS
3-Methyl-1-butanol	16.8	1000	5,000	ND	PASS
Acetone	19.4	1000	5,000	ND	PASS
Anisole	104	1000	5,000	ND	PASS
Butyl acetate	67.3	1000	5,000	ND	PASS
Dimethyl sulfoxide	55.8	1000	5,000	ND	PASS
Ethanol	34.5	1000	5,000	ND	PASS
Ethyl acetate	17.3	1000	5,000	ND	PASS
Ethyl ether	27	1000	5,000	ND	PASS
Ethyl formate	92.5	1000	5,000	ND	PASS
Heptane	19.2	1000	5,000	ND	PASS
Isobutyl acetate	28.4	1000	5,000	ND	PASS
Isopropyl acetate	13.5	1000	5,000	ND	PASS
Methyl acetate	26.9	1000	5,000	ND	PASS
Methylethyl ketone	13.1	1000	5,000	ND	PASS
Pentane	35.7	1000	5,000	ND	PASS
Propyl acetate	13.5	1000	5,000	ND	PASS
Tert-Butylmethyl ether	134.2	1000	5,000	ND	PASS
Triethylamine	22.4	1000	5,000	ND	PASS

Abbreviations: wt% = percentage of weight, CFU = colony forming units, ppm = Parts per million, ppb = Parts per billion, ND = None Detected, BLQ = Below Limit of Quantification, LOQ = Limit of Quantification, LOD = Limit of Detection, RL = Reporting Limit, \* = Mixture of Isomers

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<b>Pesticides Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
Abamectin	0.0244	0.25	0.25	ND	PASS
Acephate	0.003	0.05	0.05	ND	PASS
Acequinocyl	0.1489	0.50		ND	PASS
Acetamiprid	0.0019	0.05	0.05	ND	PASS
Aldicarb	0.0458	0.5	0.5	ND	PASS
Allethrin	0.0306	0.1	0.1	ND	PASS
Azadirachtin	0.0638	0.5	0.5	ND	PASS
Azoxystrobin	0.0014	0.01	0.01	ND	PASS
Benzovindiflupyr	0.003	0.01	0.01	ND	PASS
Bifenazate	0.0024	0.01	0.01	ND	PASS
Bifenthrin	0.0259	0.10		ND	PASS
Boscalid	0.0022	0.01	0.01	ND	PASS
Buprofezin	0.0160	0.10		ND	PASS
Carbaryl	0.0046	0.025	0.025	ND	PASS
Carbofuran	0.0022	0.01	0.01	ND	PASS
Chlorantraniliprole	0.0146	0.10		ND	PASS
Chlorfenapyr	0.2688	1.5	1.5	ND	PASS
Chlorpyrifos	0.0143	0.5	0.5	ND	PASS
Clofentezine	0.0012	0.01	0.01	ND	PASS
Clothianidin	0.005	0.025	0.025	ND	PASS
Coumaphos	0.003	0.01	0.01	ND	PASS
Cyantraniliprole	0.0043	0.01	0.01	ND	PASS
Cyfluthrin	0.1434	0.50		ND	PASS
Cypermethrin	0.0451	0.30		ND	PASS
Cyprodinil	0.0023	0.01	0.01	ND	PASS
Daminozide	0.0351	0.30		ND	PASS
Deltamethrin	0.0305	0.10		ND	PASS
Diazinon	0.0163	0.10		ND	PASS
Dichlorvos	0.0127	0.05	0.05	ND	PASS
Dimethoate	0.0022	0.01	0.01	ND	PASS
Dimethomorph	0.0272	0.10		ND	PASS
Dinotefuran	0.0037	0.05	0.05	ND	PASS
Dodemorph	0.0247	0.10		ND	PASS
Endosulfan-alpha	0.1472	2.5	2.5	ND	PASS
Endosulfan-beta	0.2012	2.5	2.5	ND	PASS
Endosulfan sulfate	0.0181	2.5	2.5	ND	PASS
Ethoprophos	0.0029	0.01	0.01	ND	PASS
Etofenprox	0.0217	0.10		ND	PASS
Etoxazole	0.0161	0.10		ND	PASS
Etridiazol	0.0195	0.15	0.15	ND	PASS
Fenoxycarb	0.0032	0.01	0.01	ND	PASS
Fenpyroximate	0.0135	0.10		ND	PASS
Fensulfothion	0.0026	0.01	0.01	ND	PASS

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<b>Pesticides Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
Fenthion	0.0031	0.01	0.01	ND	PASS
Fenvalerate	0.1895	0.50		ND	PASS
Fipronil	0.0031	0.01	0.01	ND	PASS
Flonicamid	0.0047	0.025	0.025	ND	PASS
Fludioxonil	0.003	0.01	0.01	ND	PASS
Fluopyram	0.003	0.01	0.01	ND	PASS
Hexythiazox	0.0178	0.10		ND	PASS
Imazalil	0.0024	0.01	0.01	ND	PASS
Imidacloprid	0.0029	0.01	0.01	ND	PASS
Iprodione	0.0521	0.5	0.5	ND	PASS
Kinoprene	0.0895	1.25	1.25	ND	PASS
Kresoxim-methyl	0.0028	0.15	0.15	ND	PASS
Malathion	0.0023	0.01	0.01	ND	PASS
Metalaxyl	0.0022	0.01	0.01	ND	PASS
Methiocarb	0.003	0.01	0.01	ND	PASS
Methomyl	0.0041	0.025	0.025	ND	PASS
Methoprene	0.1350	0.50		ND	PASS
Mevinphos	0.0046	0.025	0.025	ND	PASS
MGK-264	0.2124	0.50		ND	PASS
Myclobutanil	0.005	0.01	0.01	ND	PASS
Naled	0.0245	0.10		ND	PASS
Novaluron	0.0031	0.025	0.025	ND	PASS
Oxamyl	0.0088	1.5	1.5	ND	PASS
Paclobutrazol	0.0033	0.01	0.01	ND	PASS
Parathion-methyl	0.2699	0.5		ND	PASS
Permethrin	0.0441	0.3		ND	PASS
Phenothrin	0.0583	0.30		ND	PASS
Phosmet	0.0157	0.30		ND	PASS
Piperonyl butoxide	0.0162	1.25	1.25	ND	PASS
Pirimicarb	0.002	0.01	0.01	ND	PASS
Prallethrin	0.0631	0.60		ND	PASS
Propiconazole	0.0178	0.10		ND	PASS
Propoxur	0.0025	0.01	0.01	ND	PASS
Pyraclostrobin	0.0029	0.01	0.01	ND	PASS
Pyrethrins	0.0221	0.10		ND	PASS
Pyridaben	0.0022	0.02	0.02	ND	PASS
Quintozene	0.1097	0.10		ND	PASS
Resmethrin	0.0098	0.05	0.05	ND	PASS
Spinetoram	0.0037	0.01	0.01	ND	PASS
Spinosad	0.0033	0.01	0.01	ND	PASS
Spirodiclofen	0.0801	0.3		ND	PASS
Spiromesifen	0.0200	0.10		ND	PASS
Spirotetramat	0.0032	0.01	0.01	ND	PASS

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<b>Pesticides Analysis</b>	LOD (ppm)	LOQ (ppm)	RL (ppm)	Result (ppm)	Status
Spiroxamine	0.0306	0.10		ND	PASS
Tebuconazole	0.0017	0.01	0.01	ND	PASS
Tebufenozide	0.0022	0.01	0.01	ND	PASS
Teflubenzuron	0.0037	0.025	0.025	ND	PASS
Tetrachlorvinphos	0.002	0.01	0.01	ND	PASS
Tetramethrin	0.0198	0.02		ND	PASS
Thiacloprid	0.0017	0.01	0.01	ND	PASS
Thiamethoxam	0.0019	0.01	0.01	ND	PASS
Thiophanate-methyl	0.0132	0.01		ND	PASS
Trifloxystrobin	0.0019	0.01	0.01	ND	PASS

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## Details of Testing

### **Cannabinoid Analysis**

Analysis of 11 Cannabinoids by HPLC & UHPLC

Method LAB-MTD-020: Flower (LOQ 0.06%), Oil (LOQ 0.03%), Concentrates (LOQ 0.6%)

Method LAB-MTD-021: Isolates (LOQ 0.06%)

Method LAB-MTD-023: Tablets & Granules (LOQ 0.025%)

Method LAB-MTD-030: Topicals (LOQ 0.005%)

Method LAB-MTD-039: Determination of 5 Cannabinoids in Cannabis Edibles; Liquid Edibles (LOQ 0.0002%) and Solid Edibles (LOQ 0.005%)

### **Terpene Analysis**

Profile of 42 terpenes by GC/MS

Method LAB-MTD-035: Cannabis Flower, Oil

### **Pesticide Analysis**

Determination of 96 Pesticide Residues by LC/MS/MS and GC/MS/MS

Method LAB-MTD-010: Cannabis Flower, Oil

Method LAB-MTD-040: Determination of EP Pesticide Residue in Cannabis Oil by GCMSMS

Method LAB-MTD-041: Determination of EP Pesticide Residues in Cannabis Flower and Related Products by GCMSMS

### **Mycotoxin Analysis**

Determination of Aflatoxins B1, B2, G1, G2 and Ochratoxin-A by LC/MS/MS

Method LAB-MTD-010: Cannabis Flower, Oil

Method LAB-MTD-029: Tablets

Method LAB-MTD-037: Topicals

### **Heavy Metal Analysis**

Determination of Heavy Metal contamination (Arsenic, Cadmium, Lead & Mercury) by ICP/MS

Method LAB-MTD-027: Cannabis Flower, Oil, Topicals, Tablets

### **Residual Solvents Analysis**

Determination of 24 Residual Solvents by GC/MS

Method LAB-MTD-036: Cannabis Oil

Method LAB-MTD-028: Tablets

### **Determination of Butane and Propane Residual Solvents in Cannabis Oil**

Method LAB-MTD-034 (GC/MS): Cannabis Oil

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## Details of Testing

### **Microbial Analysis, Powdery Mildew & Gender Determination**

Molecular detection and quantitation by PCR & qPCR

Cannabis Flower, Oil, Cannabis-Infused Products

Method MIC-MTD-001 (TAMC, TYMC, BTGN, E.coli, Salmonella, Staph/Pseudomonas)

Method MIC-MTD-005: (Powdery Mildew & Gender Determination)

Method MIC-MTD-006: Determination of Viruses in Cannabis via qPCR and ELISA

### **Moisture Analysis**

Water Activity & Moisture Content (Loss on Drying)

Method LAB-MTD-017 (Loss on Drying; Dry flower only)

Method LAB-MTD-031 (Water activity,  $a_w$ )

### **Foreign Matter Analysis**

Visual/Magnified Inspection for Foreign Matter

Method LAB-MTD-022

### **Total Ash Analysis**

Method LAB-MTD-043: Total Ash by Muffle Furnace in Cannabis Products

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