

HOP QUALITY REPORT CERTIFICATE OF ANALYSIS

To: Wisconsin Hop Exchange

Sample ID: 22MAK1087-01LH

Variety: Mackinac™

Whole Cone ☐

Date : 1/11/2023

Pellet ☒



Certifying Officer: Zach Lilla - Lab Manager
TTB Certified Chemist - Member AOAC - ASBC - BJCP

Method		
Hops-4C	Moisture Analysis	
	% Moisture	9.6
	% Dry Matter	90.4
AAR	Xanthohumol by HPLC	NT mg/g
Hops-12	Hop Storage Index	HSI 0.302
Hops-13	Essential Oil by Steam Distillation	mL/100g 1.78
Hops-14	Alpha and Beta Acids by HPLC	
ICE-3		
	Cohumulone	30.6 (% of Total AA)
	% Alpha Acids	10.12
	Colupulone	56.3 (% of Total BA)
	% Beta Acids	3.28
	a/b ratio	3.09
Hops-17	Hop Essential Oil by GC-FID	
	(as is)	
	% area	mg/100g
	B-Pinene	NT NT
	Myrcene	NT NT
	Linalool	NT NT
	Caryophyllene	NT NT
	Farnesene	NT NT
	Humulene	NT NT
	Geraniol	NT NT

NT=NOT TESTED

Signed: _____

Zachary Lilla - Lab Manager - TTB Certified Chemist
AAR LAB - ADVANCED ANALYTICAL RESEARCH
2517 Advance Rd Ste. A Madison WI 53718



AROMA QUALITY (AQ) HOP QUALITY REPORT

Customer : Wisconsin Hop Exchange

Sample ID: 22MAK1087-01LH

Variety: Mackinac™

Whole Cone ☐

Pellet ☒

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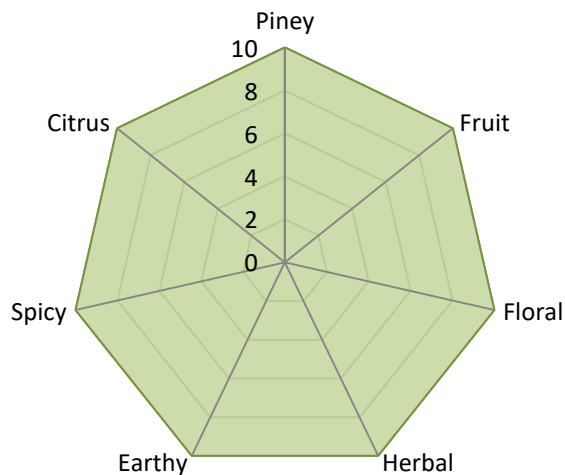
Certifying Officer: Zach Lilla - Lab Manager
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% Moisture	9.6	Typical Range	8 - 12%	☒
HOP QUALITY (adjusted to 10% moisture)				
Total Oil ml/100g	1.77		1.2 - 1.8 ml	☒
columulone	30.6		27 - 32%	☒
Alpha Acids	10.07		9.0 - 13%	☒
Beta Acids	3.26		3.0 - 3.5%	☒

AROMA QUALITY (AQ)

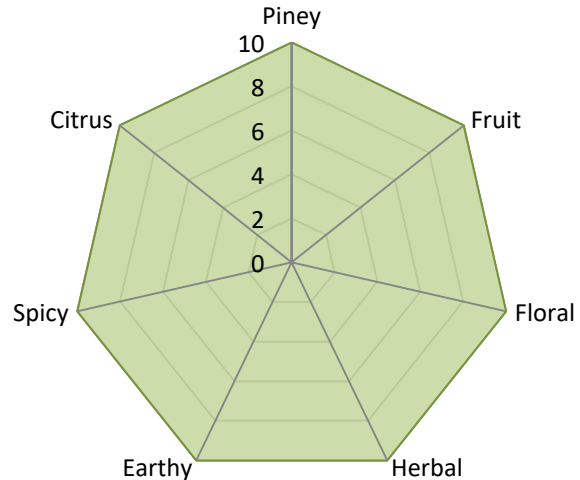
	% Area		mg/mL of Hop Oil			mg/100g of Hops (@10%H2O)		
B-Pinene	NT	0.40 - 1.00 %	NT	4 - 10		NT	4.8 - 18	
Myrcene	NT	15.00 - 25.00 %	NT	150 - 250		NT	180 - 450	
Linalool	NT	0.6 - 1.20 %	NT	6 - 12		NT	7.2 - 21.6	
Caryophyllene	NT	9.00 - 12.00 %	NT	90 - 120		NT	108 - 216	
Farnesene	NT	0.01 - 1.00 %	NT	0.1 - 10		NT	0.12 - 18	
Humulene	NT	17.00 - 23.00 %	NT	170 - 230		NT	204 - 414	
Geraniol	NT	0.60 - 1.00 %	NT	6 - 10		NT	7.2 - 18	

AQ vs VARIETY SPECS



Aroma Intensity= 100

AQ vs ALL HOP VARIETIES



Aroma Intensity= 100

Signed: _____

Zachary Lilla - Lab Manager - TTB Certified Chemist

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