NHR ORGANIC OILS
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Certificate of Analysis & Gas Chromatography
Organic Black Spruce Essential Oil
(Picea mariana)

Botanical Name:	*Picea mariana (Mill.) Britton, Sterns &Poggenb.*
Commercial Name:	Organic Black Spruce
Geographical Origin:	Canada
Batch Number:	191026-3

Physical and Chemical Data:

	Standards	Results of analysis
Appearance	Liquid	Conform
Colour	Colourless to yellow	Conform
Odour	Fresh, resinous, balsamic	Conform
Relative Density at 20°C	0.900 to 0.920	0.9130
Refractive Index at 20°C	1.465 to 1.475	1.4713
Flash Point	+35°C to +45°C	

Components	Contents
Toluene	0.02%
Hexanal	0.03%
Octane	0.01%
(2E)-Hexenal	0.01%
(3Z)-Hexenol	0.06%
Hexanol	0.03%
Santene	1.88%
Hashishene	0.01%
Tricyclene	1.45%
Alpha-thujene	0.26%
Alpha-pinene	17.06%
Alpha-fenchene	0.08%
Camphene	14.69%
Thuja-2,4(10)-diene	0.04%
Benzaldehyde	0.01%
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.07%
Beta-pinene	7.04%
Sabinene	0.25%
Dehydro-1,8-cineole	0.02%
2-Pentylfuran	0.01%
Myrcene	3.88%
2-Carene	0.01%
Alpha-phellandrene	0.31%

Octanal	0.01%
Delta-3-carene	9.85%
Alpha-terpinene	0.22%
Carvomenthene	0.01%
Meta-cymene	0.01%
Para-cymene	0.29%
Limonene	3.27%
Beta-phellandrene	1.37%
Cineole-1,8 (Eucalyptol)	0.52%
Z-beta-ocimene	0.02%
E-beta-ocimene	0.02%
Gamma-terpinene	0.24%
Meta-cymenene	0.03%
Fenchone	0.02%
Isoterpinolene	0.06%
Gamma-campholenal	0.05%
Terpinolene	1.02%
Para-cymenene	0.12%
Oxyde d'alpha-pinene	0.01%
2-Nonanone	0.01%
Perillene	0.01%
Linalool	0.58%
Nonanal	0.03%
Endo-fenchol	0.07%
3-Methyl-3-butenyl Isovalerate	0.02%
Cis-para-menth-2-en-1-ol	0.08%
Alpha-campholenal	0.18%
Trans-pinocarveol	0.22%
Camphor	0.13%
Camphene Hydrate	0.61%
Isoborneol	0.11%
Pinocamphone	0.03%
Citronellal	0.09%
Pinocarvone	0.04%
Borneol	1.32%
Beta-elemene	0.08%
Longifolene	0.18%
Beta-caryophyllene	0.33%
Beta-copaene	0.02%
Cis-muurola-3,5-diene	0.02%
Trans-muurola-3,5-diene	0.04%
Alpha-humulene	0.07%
Trans-cadina-1(6),4-diene	0.08%
Selina-4,11-diene	0.05%
Gamma-muurolene	0.09%
Dodecanol	0.04%
Germacrene D	0.18%
Beta-selinene	0.05%
Trans-muurola-4(15),5-diene	0.01%
Alpha-selinene	0.07%
Alpha-muurolene	0.30%
Germacrene A	0.02%
Gamma-cadinene	0.37%
Beta-bisabolene	0.05%
(3E,6E)-Alpha-farnesene	0.01%
Delta-cadinene	1.25%
Trans-calamenene	0.07%
Zonarene	0.10%
Trans-cadina-1,4-diene	0.05%
Alpha-cadinene	0.09%
Alpha-calacorene	0.02%
E-alpha-bisabolene	0.11%

Beta-calacorene	0.01%
E-Nerolidol	0.01%
Spathulenol	0.03%
Caryophyllene Oxide	0.02%
Globulol	0.02%
10-Epi-cubenol	0.04%
1-Epi-cubenol	0.03%
Tau-cadinol	0.14%
Tau-muurolol	0.15%
Alpha-muurolol	0.05%
Alpha-cadinol	0.25%
Cis-calamenen-10-ol	0.01%
Trans-calamenen-10-ol	0.02%
(1,8Z,11Z,14Z)-Heptadecatetraene	0.01%
(8Z)-Heptadecene	0.01%
Amorpha-4,9-dien-2-ol	0.03%
Oplopanone	0.02%
Para-camphorene	0.01%
(E,E)-Geranyllinalol	0.01%
Manool	0.03%
7,13-Abietadiene	0.01%
E-Abienol	0.04%
Palustral	0.02%
Dehydroabietal	0.01%
Abietal	0.01%
TOTAL	**98.23%**