



European Medicines Agency  
Evaluation of Medicines for Human Use

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**COMMITTEE ON HERBAL MEDICINAL PRODUCTS  
(HMPC)**

**FINAL**

**COMMUNITY HERBAL MONOGRAPH ON  
*MENTHA x PIPERITA* L., AETHEROLEUM**

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| <b>DISCUSSION IN WORKING PARTY ON COMMUNITY MONOGRAPHS AND COMMUNITY LIST (MLWP)</b>   | January 2007<br>March 2007<br>May 2007 |
| <b>ADOPTION BY HMPC FOR RELEASE FOR CONSULTATION</b>                                   | 8 May 2007                             |
| <b>END OF CONSULTATION (DEADLINE FOR COMMENTS)</b>                                     | 15 August 2007                         |
| <b>REDISCUSSION IN WORKING PARTY ON COMMUNITY MONOGRAPHS AND COMMUNITY LIST (MLWP)</b> | October 2007                           |
| <b>ADOPTION BY HMPC</b>                                                                | 31 October 2007                        |

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| <b>KEYWORDS</b> | Herbal medicinal products; HMPC; Community herbal monographs; well-established medicinal use; traditional use; <i>Mentha x piperita</i> L.; Menthae piperitae aetheroleum; peppermint oil |
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## COMMUNITY HERBAL MONOGRAPH ON *MENTHA x PIPERITA* L., AETHEROLEUM

### 1. NAME OF THE MEDICINAL PRODUCT

To be specified for the individual finished product.

### 2. QUALITATIVE AND QUANTITATIVE COMPOSITION<sup>1, 2</sup>

| <u>Well-established use</u>                                                                                       | <u>Traditional use</u>                                                                           |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| With regard to the marketing authorisation application of Article 10(1)(a)(ii) of Directive 2001/83/EC as amended | With regard to the registration application of Article 16d(1) of Directive 2001/83/EC as amended |
| <i>Mentha x piperita</i> L., aetheroleum (peppermint oil)                                                         | <i>Mentha x piperita</i> L., aetheroleum (peppermint oil)                                        |
| i) Herbal substance<br>not applicable                                                                             | i) Herbal substance<br>not applicable                                                            |
| ii) Herbal preparation                                                                                            | ii) Herbal preparation                                                                           |
| Essential oil obtained by steam distillation from the fresh aerial parts of the flowering plant.                  | Essential oil obtained by steam distillation from the fresh aerial parts of the flowering plant. |

### 3. PHARMACEUTICAL FORM

| <u>Well-established use</u>                                                                  | <u>Traditional use</u>                                                                                                                         |
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| In gastro-resistant capsules (for oral use).                                                 | In liquid or semi-solid preparations                                                                                                           |
| In liquid or semi-solid preparations (for cutaneous use).                                    | <ul style="list-style-type: none"> <li>• For cutaneous and transdermal use</li> <li>• For inhalation.</li> <li>• For oromucosal use</li> </ul> |
| The pharmaceutical form should be described by the European Pharmacopeia full standard term. | The pharmaceutical form should be described by the European Pharmacopeia full standard term.                                                   |

<sup>1</sup> The material complies with the Ph. Eur. monograph (ref. 01/2005:0405)

<sup>2</sup> The declaration of the active substance(s) for an individual finished product should be done in accordance with relevant herbal quality guidance.

## 4. CLINICAL PARTICULARS

### 4.1 Therapeutic indications

| <u>Well-established use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                       | <u>Traditional use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| <ul style="list-style-type: none"><li>• Oral use<ol style="list-style-type: none"><li>1. Herbal medicinal product for the symptomatic relief of minor spasms of the gastrointestinal tract, flatulence and abdominal pain, especially in patients with irritable bowel syndrome.</li></ol></li><li>• Cutaneous use<ol style="list-style-type: none"><li>2. Herbal medicinal product for the symptomatic relief of mild tension type headache.</li></ol></li></ul> | <p>Traditional herbal medicinal product</p> <ul style="list-style-type: none"><li>• Cutaneous and transdermal use<ol style="list-style-type: none"><li>1. For the relief of symptoms in coughs and colds</li><li>2. For the symptomatic relief of localised muscle pain</li><li>3. For the symptomatic relief of localised pruritic conditions in intact skin</li></ol></li><li>• Inhalation<ol style="list-style-type: none"><li>4. For the relief of symptoms in coughs and colds</li></ol></li><li>• Oromucosal use<ol style="list-style-type: none"><li>5. For the relief of symptoms in coughs and colds</li></ol></li></ul> <p>The product is a traditional herbal medicinal product for use in specified indications exclusively based upon long-standing use.</p> |

### 4.2 Posology and method of administration

| <u>Well-established use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <u>Traditional use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| <p><b>Posology</b></p> <ul style="list-style-type: none"><li>• Oral use</li></ul> <p>The use is not recommended in children under 8 years of age (see 4.4 Special warnings and precautions for use).</p> <p><i>Adolescents over 12 years of age, adults, elderly</i><br/>0.2 - 0.4 ml in gastro-resistant capsules up to three times daily.</p> <p><i>Children between 8 to 12 years of age</i><br/>0.2 ml in gastro resistant capsules, up to three times daily.</p> <ul style="list-style-type: none"><li>• Cutaneous use</li></ul> <p>The use is not recommended in children and adolescents under 18 years of age (see 4.4 Special warnings and precautions for use).</p> | <p><b>Posology</b></p> <p>The use in children under 2 years of age is contraindicated (see 4.3 Contraindications).</p> <p>The use is not recommended in children between 2 to 4 years of age (see 4.4 Special warnings and precautions for use).</p> <ul style="list-style-type: none"><li>• Cutaneous and transdermal use<ul style="list-style-type: none"><li>- <u>Indications 1, 2 and 3</u></li></ul></li></ul> <p>Single dose</p> <p><i>Children between 4 to 10 years of age</i><br/>Semi-solid preparations 2 - 10%<br/>Hydroethanolic preparations 2 - 4%</p> <p><i>Children between 10 to 12 years of age, adolescents between 12 to 16 years of age</i><br/>Semi-solid preparations 5 - 15%<br/>Hydroethanolic preparations 3 - 6%<br/>up to three times daily</p> |

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| <p><i>Adults, elderly</i><br/>In liquid or semi-solid preparations 10% in ethanol, up to three times daily.</p> <p><b>Duration of use</b></p> <ul style="list-style-type: none"> <li>• Oral use</li> </ul> <p>The gastro-resistant capsules should be taken until symptoms resolve, usually within one or two weeks. At times when the symptoms are more persistent, the intake of gastro-resistant capsules can be continued for periods of no longer than 3 months per course.</p> <ul style="list-style-type: none"> <li>• Cutaneous use</li> </ul> <p>If symptoms persist or worsen after 2 weeks, a physician should be consulted.</p> <p><b>Method of administration</b></p> <ul style="list-style-type: none"> <li>• Oral use</li> </ul> <p>The capsule must be taken before meals.</p> <ul style="list-style-type: none"> <li>• Cutaneous use</li> </ul> <p>The solution should be rubbed on the skin of the forehead and temples, every 15 minutes.</p> | <p><i>Adolescents over 16 years of age, adults</i><br/>Semi-solid and oily preparations 5 - 20%<br/>In aqueous-ethanol preparations 5 - 10%<br/>In nasal ointments 1 - 5% essential oil.</p> <ul style="list-style-type: none"> <li>• Inhalation <ul style="list-style-type: none"> <li>- <u>Indication 4</u></li> </ul> </li> </ul> <p><i>Adolescents over 12 years of age, adults</i><br/>2 - 4 drops up to three times daily</p> <ul style="list-style-type: none"> <li>• Oromucosal use <ul style="list-style-type: none"> <li>- <u>Indication 5</u></li> </ul> </li> </ul> <p>2 - 3 drops (0.08 - 0.12 ml), 3 - 4 times per day (0.2 - 0.5 ml)</p> <p><b>Duration of use</b></p> <ul style="list-style-type: none"> <li>- <u>Indications 1, 4 and 5</u></li> </ul> <p>Not to be used for more than 2 weeks.</p> <ul style="list-style-type: none"> <li>- <u>Indications 2 and 3</u></li> </ul> <p>It is not recommended to use the medicinal product continuously for more than 3 months.</p> <p>If the symptoms persist during the use of the medicinal product, a doctor or a qualified health care practitioner should be consulted.</p> <p><b>Method of administration</b></p> <ul style="list-style-type: none"> <li>• Cutaneous and transdermal use <ul style="list-style-type: none"> <li>- <u>Indication 1</u></li> </ul> <p>Application on the chest or on the back</p> <ul style="list-style-type: none"> <li>- <u>Indications 2 and 3</u></li> </ul> <p>Application on the affected area</p> </li> <li>• Inhalation <p>The essential oil is added to hot water and the vapour is inhaled. Alternatively, the essential oil can be added on an appropriate support/material and the vapour is inhaled.</p> </li> <li>• Oromucosal use <p>In lozenges or oral spray.</p> </li> </ul> |
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### 4.3 Contraindications

| <u>Well-established use</u>                                                                                                                                                                                                                                                                                | <u>Traditional use</u>                                                                                                                                                                                            |
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| <ul style="list-style-type: none"><li>• Oral use<br/><br/>Hypersensitivity to peppermint oil or menthol.<br/>Patients with liver disease, cholangitis, achlorhydria, gallstones and any other biliary disorders.</li><li>• Cutaneous use<br/><br/>Hypersensitivity to peppermint oil or menthol.</li></ul> | <p>Children under 2 years of age, because menthol can induce reflex apnoea and laryngospasm.</p> <p>Children with history of seizures (febrile or not).</p> <p>Hypersensitivity to peppermint oil or menthol.</p> |

### 4.4 Special warnings and precautions for use

| <u>Well-established use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <u>Traditional use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| <ul style="list-style-type: none"><li>• Oral use<br/><br/>The use is not recommended in children under 8 years of age, as there is no sufficient experience available.<br/><br/>The capsules should be swallowed whole, i.e. not broken or chewed, because this would release the peppermint oil prematurely, possibly causing local irritation of the mouth and oesophagus.<br/><br/>Patients, who already suffer from heartburn or hiatal hernia have sometimes an exacerbation of this symptom after taking peppermint oil. Treatment should be discontinued in these patients.</li><li>• Cutaneous use<br/><br/>The use is not recommended in children and adolescents under 18 years of age.<br/><br/>Eye contact with unwashed hands after the application of peppermint oil may potentially cause irritation.</li></ul> | <p>The use is not recommended in children between 2 to 4 years of age, as there is no sufficient experience available.</p> <ul style="list-style-type: none"><li>• Cutaneous and transdermal use<br/><br/>Eye contact with unwashed hands after the application of peppermint oil, may potentially cause irritation.<br/><br/>Peppermint oil should not be applied on broken or irritated skin.</li><li>• Oromucosal use<br/><br/>Patients, who already suffer from heartburn or hiatal hernia have sometimes an exacerbation of this symptom after taking peppermint oil. Treatment should be discontinued in these patients.<br/><br/>Peppermint oil should be used with caution in inflamed and ulcerated conditions of the gastrointestinal tract.</li></ul> |

### 4.5 Interactions with other medicinal products and other forms of interaction

| <u>Well-established use</u>                                                                                                                                                                                                                                                                                                                                        | <u>Traditional use</u> |
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| <ul style="list-style-type: none"><li>• Oral use<br/><br/>Use of food or antacids administered at the same time could cause early release of capsule content. Other medicinal products used to decrease stomach acid, like histamine-2 blockers and proton pump inhibitors may cause premature dissolution of the enteric coating and should be avoided.</li></ul> | <p>None reported.</p>  |

#### 4.6 Pregnancy and lactation

| <u>Well-established use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <u>Traditional use</u>                                                                                                                                                                                                             |
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| <ul style="list-style-type: none"><li>• Oral use<br/>Studies in animals have shown no teratogenic effects.<br/>It is unknown if peppermint constituents are excreted in human breast milk. In the absence of sufficient data, the use during pregnancy and lactation is not recommended.</li><li>• Cutaneous use<br/>Data on the use during pregnancy and lactation is not available. As a general precaution, the use is not recommended, unless medical advice proposed benefit is higher than the potential risk.</li></ul> | <ul style="list-style-type: none"><li>• Cutaneous and transdermal use</li><li>• Inhalation</li><li>• Oromucosal use</li></ul> <p>In the absence of sufficient data, the use during pregnancy and lactation is not recommended.</p> |

#### 4.7 Effects on the ability to drive and use machines

| <u>Well-established use</u>                                                            | <u>Traditional use</u>                                                                 |
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| No studies on the effect on the ability to drive and use machines have been performed. | No studies on the effect on the ability to drive and use machines have been performed. |

#### 4.8 Undesirable effects

| <u>Well-established use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <u>Traditional use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| <ul style="list-style-type: none"><li>• Oral use<br/>Urine and stools with an odour to menthol were observed; dysuria and inflammation of the glans of the penis have been reported. The frequency is not known.<br/><br/>Allergic reactions to menthol were reported, with headache, bradycardia, muscle tremor, ataxia, anaphylactic shock and erythematous skin rash. The frequency is not known.<br/><br/>Heartburn, perianal burning, blurred vision, nausea and vomiting were reported. The frequency is not known.</li><li>• Cutaneous use<br/>Hypersensitivity reactions such as skin rash, contact dermatitis, and eye irritation have been reported. These reactions are the most of the time mild and transient.<br/><br/>If other adverse reactions not mentioned above occur, a doctor or a pharmacist should be consulted.</li></ul> | <ul style="list-style-type: none"><li>• Cutaneous and transdermal use<br/>Hypersensitivity reactions such as skin rash, contact dermatitis, and eye irritation have been reported. These reactions are most of the time mild and transient. The frequency is not known. Irritation of the skin and mucosa of the nose is possible, after local application. The frequency is not known.</li><li>• Inhalation<br/>Apnoea, broncho- and laryngoconstriction in hypersensitive patients have been reported. The frequency is not known.</li><li>• Oromucosal use<br/>Contact sensitivity to menthol and peppermint oil in patients presenting with intra-oral symptoms in association with burning mouth syndrome, recurrent oral ulceration or a lichenoid reaction, were reported. The frequency is not known.</li></ul> |

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|  | <p>Allergic reactions to menthol were reported, with headache, bradycardia, muscle tremor, ataxia, anaphylactic shock and erythematous skin rash. The frequency is not known.</p> <p>If other adverse reactions not mentioned above occur, a doctor or a qualified health care professional should be consulted.</p> |
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## 4.9 Overdose

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| <p><u>Well-established use</u></p> <ul style="list-style-type: none"> <li>Oral use</li> </ul> <p>Overdose may cause severe gastro-intestinal symptoms, diarrhoea, rectal ulceration, epileptic convulsions, loss of consciousness, apnoea, nausea, disturbances in cardiac rhythms, ataxia and other CNS problems, probably due to the presence of menthol.</p> <p>In the event of overdose, the stomach should be emptied by gastric lavage. Observation should be carried out with symptomatic treatment if necessary.</p> | <p><u>Traditional use</u></p> <ul style="list-style-type: none"> <li>Cutaneous and transdermal use</li> </ul> <p>No case of overdose has been reported.</p> <ul style="list-style-type: none"> <li>Inhalation</li> </ul> <p>Inhalation of large doses of menthol may lead to dizziness, confusion, muscle weakness, nausea and double vision.</p> <ul style="list-style-type: none"> <li>Oromucosal use</li> </ul> <p>Overdose may cause severe gastro-intestinal symptoms, diarrhoea, rectal ulceration, epileptic convulsions, loss of consciousness, apnoea, nausea, disturbances in cardiac rhythms, ataxia and other CNS problems, probably due to the presence of menthol.</p> <p>In the event of overdose, the stomach should be emptied by gastric lavage. Observation should be carried out with symptomatic treatment if necessary.</p> |
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## 5. PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

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| <p><u>Well-established use</u></p> <ul style="list-style-type: none"> <li><u>Oral use</u></li> </ul> <p>Pharmacotherapeutic group: <i>Other drugs for functional bowel disorders</i></p> <p>ATC code: A03AX</p> <p><i>In vitro</i> studies</p> <p>The principal pharmacodynamic effect of peppermint oil relevant to the gastrointestinal tract is a dose-related antispasmodic effect on the smooth musculature, due to the interference of menthol with the movement of calcium across the cell membrane.</p> | <p><u>Traditional use</u></p> <p>Not required as per Article 16c(1)(a)(iii) of Directive 2001/83/EC as amended.</p> |
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| <p>Peppermint oil showed antifoaming and carminative activity <i>in vitro</i>. Reductions in gastric and intestinal foam volume were observed <i>in vitro</i> studies with peppermint oil.</p> <p><i>In vivo</i> studies</p> <p>In several studies in healthy subjects or patients, who underwent exposure to peppermint oil either by topical intraluminal (stomach or colon) or oral administration by single doses, result in effects, indicating a substantial spasmolytic action of peppermint oil on the smooth muscles of the gastrointestinal tract.</p> <p>The enteric coating delays the release of the product until it reaches the distal small bowel, exerting local effects of colonic relaxation.</p> <p>Peppermint appears to enhance production of bile. The choleretic and antifoaming effects of peppermint oil play an additional role to the antispasmodic action, decreasing the abdominal distension, as the discomfort and abdominal pain.</p> <ul style="list-style-type: none"> <li>• Cutaneous use</li> </ul> <p>Pharmacotherapeutic group: <i>Other local anesthetics</i><br/>ATC code: <i>N01BX</i></p> <p>The topical application of peppermint oil, produces a prolonged cold sensation at the local of application, by the stimulation of the cold-sensitive receptors, giving an analgesic effect.</p> <p>The application to the forehead showed on the EMG activity, a significant reduction of the M temporalis wave, as a pronounced increase in blood flow through the capillaries of the skin</p> |  |
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## 5.2 Pharmacokinetic properties

| <u>Well-established use</u>                                                                                                                                                                                                                                                                                                                                                                | <u>Traditional use</u>                                                               |
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| <ul style="list-style-type: none"> <li>• Oral use</li> </ul> <p>Menthol and other terpene constituents of peppermint oil are fat soluble and rapidly absorbed at the proximal small intestinal tract. To some extent, they are excreted in the form of glucoronide. The peak menthol urinary excretion levels were lower and secretion delayed with the modified-release preparations,</p> | <p>Not required as per Article 16c(1)(a)(iii) of Directive 2001/83/EC as amended</p> |

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| <p>than with the immediate release preparations.</p> <p>In one clinical study with peppermint oil and one clinical study with menthol, some inhibition of CYP3A4 activity has been described. Further investigations are necessary.</p> <ul style="list-style-type: none"> <li>• Cutaneous use</li> </ul> <p>The systemic absorption after dermal application was examined and concentration time profiles were erratic and variable and the half-lives relatively shorts.</p> |  |
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### 5.3 Preclinical safety data

| <u>Well-established use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <u>Traditional use</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <p>Peppermint oil was negative in two validated tests of genotoxicity, the Ames test and the mouse lymphoma assay. There is more evidence for genotoxicity potential of menthol and there seems to be a discrepancy between peppermint oil and its most important constituent menthol. However, the present evidence points to a very weak or totally absent genotoxicity of peppermint oil.</p> <p>The highest recommended daily dose in EU is 1.2 ml peppermint oil i.e. 1,080 mg peppermint oil, which contains maximum 140 mg pulegone + menthofuran (Ph Eur). For a 60 kg person this would correspond to a daily intake of 2.3 mg/kg bw. No cases of liver damage caused by peppermint oil or mint oil were reported under that posology (see SCF report referred to in the HMPC 'Public statement on the use of herbal medicinal products containing pulegone and menthofurane' (EMA/HMPC/138386/2005)).</p> <p>The oral toxicity of menthone was evaluated in an animal model. The decrease in plasma creatinine and the increase in phosphatase alkaline and bilirubin were dose dependent, after levels of 0, 200, 400 and 800 mg/kg bw/day. The non-observable-effect-level (NOEL) for menthone in this study was lower than 200 mg/kg bw/day. A NOEL of 400 mg/kg bw/day was reported in a 28 day toxicity study in rats.</p> <p>In 2000, the FAO/WHO Joint Expert Committee on Foods Additives established an acceptable daily intake (ADI) of 0 - 4 mg/kg bw/day for menthol.</p> | <p>Not required as per Article 16c(1)(a)(iii) of Directive 2001/83/EC as amended, unless necessary for the safe use of the product.</p> <p>Peppermint oil was negative in two validated tests of genotoxicity, the Ames test and the mouse lymphoma assay. Weak and inconsistent genotoxic responses in other non-validated tests are probably toxicologically inconsequential. There is more evidence for genotoxicity potential of menthol and there seems to be a discrepancy between peppermint oil and its most important constituent menthol. However, the present evidence points to a very weak or totally absent genotoxicity of peppermint oil.</p> |

## 6. PHARMACEUTICAL PARTICULARS

| <u>Well-established use</u> | <u>Traditional use</u> |
|-----------------------------|------------------------|
| Not applicable.             | Not applicable.        |

## 7. DATE OF COMPILATION/LAST REVISION

31 October 2007