Environmental and Social Risk Assessment: Wisconsin Department of Natural Resources

Pesticide Active Ingredient: Pendimethalin

Version 1.1

2023

708 First Street North, Suite 235, Minneapolis, MN 55401 (612) 353-4511 **WWW.US.FSC.ORG**

Appendix 7: Management Unit ESRA Templates

Environmental Management Unit Assessment

Pesticide:	Pendimethalin: pendimethalin: N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine 38.7% Other Ingredients: 61.3%		***Specific Formulation:*** (CAS#) Pendulum AquaCap (40487-42-1): pendimethalin: N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine 38.7% Other Ingredients: 61.3%
Hazard Status:	Pendimethalin is a restricted, highly hazardous pesticide (HHP) based on its classification in the Environmental Toxicity hazard group and demonstration of the potential for persistence and bioaccumulation (Criterion 8) per the FSC Pesticides Policy (FSCPOL-30-001 V3-0 EN) and the FSC Lists of Highly Hazardous Pesticides (FSC-POL-30-001a EN). However, risks from other FSC hazard groups and toxicity categories were not precluded from this assessment.		**DISCLAIMER: Adoption or adaption of this national-level assessment alone does not guarantee compliance with FSC-POL-30-001 V3-0 (see Background/Expectations Section)**
Exposure Elements	**Minimum list of values**	**Description of why/why not a risk on the Management Unit (indicate "No change from national Guidance ESRA" if no change from the national assessment)[1]**	**Management Unit Mitigation strategies defined to minimize risk (indicate "No change from national Guidance ESRA" if no change from the national assessment)[2]**
Environmental	**Soil (erosion, degradation, biota, carbon storage)**	Pendimethalin dissipates in the environment by binding to soil, microbially-mediated metabolism and volatilization. It is essentially immobile in soil. Based on laboratory studies and limited field study information, pendimethalin is slightly to moderately persistent in aerobic soil environments. Persistence decreases with increased temperature, increased moisture and decreased soil organic carbon. (1)	Follow all pesticide label application instructions. Follow applicable criterion and indicators from the FSC US FM Standard V1.0 (e.g., Criterion 4.3 for worker safety, Criterion 7.3 for worker training, Criterion 6.5 for protecting water resources, and Criteria 8.1 and 8.2 for Monitoring). Additional risk mitigation strategies are provided below. Applicators should take reasonable steps to avoiding environmental and social impacts by considering the mitigation strategies provided below as well as application-, Organization-, or location-specific strategies. General consideration of exposure variables designed to mitigate risk: -Know and understand the specific pesticide formulation and/or tank mixture, as its unique
	Water (ground water, surface waters, water supplies)	Pendimethalin is toxic to fish. DO NOT apply directly to water, to areas where surface water is present, or to inter-tidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. DO NOT contaminate water when disposing of equipment washwaters or rinsate. (4) Pendimethalin may contaminate surface water from spray drift associated with aerial and ground spray	

		application, or in runoff from rainfall events and through irrigation waters (chemigation). However, its high affinity to bind to soil and sediment particles should limit concentrations of pendimethalin in surface waters. Although pendimethalin has been detected in ground water (at very low levels), the potential for ground water contamination from pendimethalin residues is low. (1)	formulation may provide a different risk characterization. -Understand how the mixture of active ingredients affects the pesticides risk profile. -Seek to minimize the frequency, interval, and amount of application. Mitigating Risk to the Environment: Reduce contact with water resources and minimize application amounts and number of applications. General and non-target species: -Minimize application amounts and number of applications. -Minimize risk of spray drift: unintentional spray drift has potential to increase risk to the environment and public welfare. -Consider that this herbicide highly toxic to fish. Non-target plants may be adversely affected from drift and run-off. Water: -Do not apply directly to water, or to areas where surface water is present. -Do not contaminate water when cleaning equipment or disposing of equipment wash waters or rinsate. - The efficacy of Pendulum AquaCap will improve if the application is followed by 1/2 inch of rainfall or its equivalent in sprinkler irrigation. -Do not apply pendimethalin through any type of irrigation system. (4)
	Atmosphere (air quality, greenhouse gasses)	Minimal indication of adverse effects to atmosphere was found when Pendimethalin is used according to label instructions in forestry applications.	
Environmental	**Non-target species (vegetation, wildlife, bees and other pollinators, pets)**	Pendimethalin would not represent a high acute risk to birds or a high acute or chronic risk to mammals. The chronic risk to birds could not be determined because avian reproduction studies have not been submitted. These studies are required. Chronic risk Levels of Concern (LOCs) for fish were exceeded by a small margin. But it is presumed that overall, pendimethalin does not represent a high risk to aquatic animals and plants, including estuarine organisms. (1)	
	Non-timber forest products (as FSC-STD-01-001 V5-2 FSC Principles and Criteria, criterion 5.1)	Minimal indication of adverse effects to non-timber forest products was found when pendimethalin is used according to label instructions in forestry applications. Secondary effects to habitats and food availability for terrestrial or aquatic animals could occur. While these concerns are acknowledged, they are common to any effective method for vegetation management, including mechanical methods that do not involve herbicide use.	
	High Conservation Values (particularly HCV 1-4)	Minimal indication of adverse effects to high conservation values was found when pendimethalin is used according to label instructions in forestry	

		applications. Additional considerations are provided below. Secondary effects on habitat, landscape and ecosystem are possible due to changes in vegetation.	
	Landscape (aesthetics, cumulative impacts)	Minimal indication of adverse effects to landscape values was found when pendimethalin is used according to label instructions in forestry applications. Additional considerations are provided, below. Secondary effects on habitat, landscape and ecosystem are possible due to changes in vegetation.	
	Ecosystem services (water, soil, carbon sequestration, tourism)	Minimal indication of adverse effects to ecosystem services was found when pendimethalin is used according to label instructions in forestry applications. Additional considerations are provided, below. Secondary effects on habitat, landscape and ecosystem are possible due to changes in vegetation	

[1] Certificate holders should enumerate in this column the difference between the national-level risk assessment and the one being developed for their management unit

[2] Certificate holders should enumerate in this column the difference between the national-level risk mitigation strategies and the ones being developed for their management unit

Sources:

(1) Environmental Protection Agency, R.E.D. Facts, EPA-738-F-97-007, June 1997. Retrieved from: https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-108501_1-Jun-97.pdf

(2) Environmental Protection Agency, Memoradum, Pendimethalin – Human Health Risk Assessment to Support the Proposed New Uses on Leaf Petiole Vegetable Subgroup 22B, Monarda and Rosemary. September 19, 2019. Retrieved from: https://downloads.regulations.gov/EPA-HQ-OPP-2018-0619-0008/content.pdf

(3) Federal Register, The Daily Journal of the US Government / Vol. 84, No. 207 / Friday, October 25, 2019 / Rules and Regulations, Pendimethalin; Pesticide Tolerances, October 25, 2019. Retrieved from: https://www.federalregister.gov/documents/2019/10/25/2019-23382/pendimethalin-pesticide-tolerances

(4) BASF Corporation (2019) Pendulum AquaCap product label. Retrieved from: https://www.cdms.net/ldat/ld3BO000.pdf

Social Management Unit Assessment Template

Pesticide:	Pendimethalin: pendimethalin: N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine 38.7% Other Ingredients: 61.3%		***Specific Formulation:*** (CAS#) Pendulum AquaCap (40487-42-1): pendimethalin: N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine 38.7% Other Ingredients: 61.3%
Hazard Status:	Pendimethalin is a restricted, highly hazardous pesticide (HHP) based on its classification in the Environmental Toxicity hazard group and demonstration of the potential for persistence and bioaccumulation (Criterion 8) per the FSC Pesticides Policy (FSCPOL-30-001 V3-0 EN) and the FSC Lists of Highly Hazardous Pesticides (FSC-POL-30-001a EN). However, risks from other FSC hazard groups and toxicity categories were not precluded from this assessment.		**DISCLAIMER: Adoption or adaption of this national-level assessment alone does not guarantee compliance with FSC-POL-30-001 V3-0 (see Background/Expectations Section)**
Exposure Elements	**Minimum list of values**	**Description of why/why not a risk on the Management Unit (indicate "No change from national Guidance ESRA" if no change from the national assessment)[1]**	**Management Unit Mitigation strategies defined to minimize risk (indicate "No change from national Guidance ESRA" if no change from the national assessment)[2]**
	High Conservation Values (especially HCV 5-6)	Minimal indication of adverse effects to High Conservation Values was found when pendimethalin is used according to label instructions in forestry applications.	Follow all pesticide label application instructions. Follow applicable criterion and indicators from the FSC US FM Standard V1.0 (e.g., Criterion 4.3 for worker safety, Criterion 7.3 for worker training, Criterion 6.5 for protecting water resources, and Criteria 8.1 and 8.2 for Monitoring). Additional risk mitigation strategies are provided below. Applicators should take reasonable steps to avoiding environmental and social impacts by considering the mitigation strategies provided below as well as application-, Organization-, or location-specific strategies. General consideration of exposure variables designed to mitigate risk:
	Health (fertility, reproductive health, respiratory health, dermatologic, neurological and gastrointestinal problems, cancer and hormonal imbalance)	Pendimethalin generally is of low acute toxicity. (1) There is no evidence that pendimethalin is a developmental, reproductive, neurotoxic, or immunotoxic chemical. There is no evidence of increased qualitative or quantitative susceptibility in the young. (3)	
Social	**Welfare**	Minimal indication of adverse effects to Welfare was found when pendimethalin is used according to label instructions in forestry applications.	

	Food and water	DO NOT treat plants grown for food or feed. DO NOT use treated plants for food or feed.. (1)	-Know and understand the specific pesticide formulation, as its unique formulation may provide a different risk characterization. -Understand the mixture of active ingredients. -Seek to minimize the frequency, interval, and amount of application. -Use the most efficient and effective method of application by seeking to minimize risk to environmental and social values. -Understand the site (e.g., soil type, topography, etc.) and climatic (e.g., wind, temperature, and humidity) conditions and the likely effect on risk to environmental and social values. -Have appropriate waste management systems in place. Mitigating Risk to Workers: When applying pesticides, label instructions should be followed. DO NOT apply this product in a way that will contact workers or other persons either directly or through drift. Only protected handlers may be in the area during application. (4) Personal Protective Equipment (PPE): Applicators and other handlers must wear: • Coveralls • Shoes plus socks • Chemical resistant nitrile rubber gloves (4). Applicators should: • Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
	Social Infrastructure; (schools and hospitals, recreational infrastructure, infrastructure adjacent to the management unit)	Minimal indication of adverse effects to social infrastructure was found when pendimethalin is used according to label instructions in forestry applications.	
	Economic viability (agriculture, livestock, tourism)	Minimal indication of adverse effects to economic viability was found when pendimethalin is used according to label instructions in forestry applications. Additional considerations are provided below: DO NOT treat plants grown for food or feed. DO NOT use treated plants for food or feed. (4) Pendimethalin is highly toxic to fish. Chronic risk Levels of Concern (LOCs) for fish were exceeded by a small margin. But it is presumed that overall, pendimethalin does not represent a high risk to aquatic animals and plants, including estuarine organisms. (1)	
	Rights (legal and customary)	Minimal indication of adverse effects to Rights, accept when access is restricted, was found when pendimethalin is used according to label instructions in forestry applications.	
	Others	No additional values were identified in this assessment.	

			• Remove clothing/PPE immediately if pesticide gets inside. Wash thoroughly and put on clean clothing. • Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing. (4) Minimizing Risk to Food and Water Resources: - Applications should be made only when there is little or no hazard from spray drift.

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Sources:

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(3) Federal Register, The Daily Journal of the US Government / Vol. 84, No. 207 / Friday, October 25, 2019 / Rules and Regulations, Pendimethalin; Pesticide Tolerances, October 25, 2019. Retrieved from: https://www.federalregister.gov/documents/2019/10/25/2019-23382/pendimethalin-pesticide-tolerances

(4) BASF Corporation (2019) Pendulum AquaCap product label. Retrieved from: https://www.cdms.net/ldat/ld3BO000.pdf