David Richard

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To: Milford Township Board of Supervisors

I am writing as a concerned citizen regarding the "Draft WellheadWatershed Zoning Amendment" currently under discussion and review by Milford Township. While I am a citizen resident outside the township, technically in Dingman Township, "Use Regulations" section G3 effectively overrides water safety regulations in place for Dingman Township for the same source water wellhead. Therefor my concerns are relevant to myself and other 'outside' community members drinking from the same source water.

In my opinion, the current zoning draft is inadequate in its particular Use Regulations to satisfy the excellent Findings and Purpose statements prefacing these specifics. It seems to ignore a previous hydrology study and designations as were utilized by the comparable Dingman ordinance.

The creation of three zones does not seem to be a problem, except in reconciling the Milford ordinance with the Dingman ordinance. However, wellhead protection is only one level of the protection needed for our communities' joint water supply. The second level of protection is for the aquifer supplying the wellhead, easily added to labelling as Zone 2. This area was designated in a previous hydrology study, even if not precisely equivalent to your 'simplified' designation. Why eliminate it now? Simply label your zone 2 as the Wellhead Aquifer Zone, a more precise designation. Also why allow for a developer's "geologist" to re-evaluate previous findings by an independent hydrologist, a more applicable professional designation?

For the Zoning Amendment chart itself, the following are my concerns for conditional use regulated land usages:

- Why allow manufacturing in all three zones? Is this consistent with drinking water protection? Why not only in zone three?

- Why permit dry cleaning, commercial dyeing, etc. in Zone 2?
- Why allow printing and photo processing using toxic chemicals in Zone 2?
- Why allow finish stripping establishments in Zone 2?
- Why allow service stations, auto repair shops, etc. in Zone 2?
- Why allow trucking terminals, etc., in Zone 2?
- Why allow hazardous waste in Zone 3 or anywhere near the water supply?
- Why allow storage tanks, underground or above ground, in Zone 2 except residential?
- Why allow oil, gasoline or hazardous material pipelines in any zone? Leaks are notorious for creating environmental problems and water issues before they can be repaired.

My basic concern is for the health and safety of the long-term shared communities' water supply. Please address this concern in terms of these particulars so I can fully support this initiative given its fine statements of Findings and Purpose.

Sincerely,

David Richard,
Concerned Citizen

Remainder of article available upon request. DR

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Statistical analysis of environmental consequences of hazardous liquid pipeline accidents

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Abstract

Although pipelines are the safest method to transport fuels, they are associated with risks due to failures, leading to significant negative consequences. This paper investigates pipeline accident data provided by PHMSA (Pipeline and Hazardous Material Safety Administration) between 2010 and 2017, with a focus on environmental consequences of hazardous liquid pipeline accidents. The average amount of released product, the average time elapsed between the accident, the emergency response from the oil company, and the average costs of environmental remediation are estimated. The impact on soil, water, and wildlife is investigated for frequency and magnitude, where possible. It was found that, on average, 85% of product released after an accident remained unrecovered, 53% of accidents led to soil contamination, 41% of accidents impacted environmentally sensitive areas, and 92% of water crossing pipelines involved in accidents were uncased. From an annual average total cost of USD 326 million, annual average environmental damage and remediation costs were USD 140 million. This analysis assists in the diagnosis of challenges that might be addressed with improved maintenance and inspection programs, especially for pipelines at higher risk of negative environmental consequences. Finally, the performance of safety management systems should be improved to efficiently

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1. Introduction

Pipelines play an important role in providing fuels for transportation and residential, commercial, and industrial uses [1]. However, although pipelines are the safest and most economical method to transport fuels [2, 3], they are associated with risks due to failures that can lead to significant negative environmental consequences. In the case of a spill, the released product becomes a hazard by dispersing in the environment, contaminating water bodies, soil, and potentially affecting people and wildlife.

On November 16, 2017 TransCanada shut down the Keystone pipeline after a drop in pressure was identified on a section of a pipeline in Amherst, South Dakota. By the time the spill was detected, 5,000 barrels of oil was released to the surrounding environment [4]. Emergency management, engineering, environmental management, and safety specialists have been evaluating the consequences of the accident since its occurrence. In March 2013, a pipeline located in Mayflower, Arkansas, ruptured causing part of the 3,190 barrels of crude oil to reach a suburban area, and causing water and soil contamination, and adverse effects on wildlife [5]. The oil flowed into Lake Conway, twenty-one houses were evacuated and wetland vegetation, waterfowl and various animal species were impacted [6]. A Corrective Action Order (CAO) was issued by the Pipeline and Hazardous Material Safety Administration (PHMSA) to the oil company responsible for the accident, ExxonMobil. In the report, PHMSA ordered ExxonMobil to revise pipeline safety measures to help prevent future accidents, improve training to its spill first responders, and equip strategically chosen sites along the pipeline with emergency supplies [6].

Although pipelines in the US have recent failure rates on the order of 10^{-3} and 10^{-4} accidents per km per year for onshore and offshore pipelines, respectively, which are the lowest failure rates among methods of transporting fuels [2, 3, 7], the impact of a single accident on the receiving environment and communities can be large. Moreover, oil pipeline accidents can have a large impact on oil companies in terms of costs [8], as they are responsible for the expenses related to the accident. Environmental Risk Assessment (ERA), State of Environment Reporting (SOE), Environmental Impact Assessment (EIA), and risk management are some of the methods to identify, analyze, and present information about environmental risk with the purpose of informing the planning and decision-making processes [9]. The assessment and reporting of environmental consequences from previous failures can be used to identify risk reduction strategies, revise emergency management and response plans, and develop integrity management programs for existing pipelines and pipeline de-