

EDITORIAL

Safety in Moving and Storing Petroleum Products

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Explosions stemming from the storage and transport of petroleum products need attention. The article in this issue by Tiefenbacher and Chandler, "Factors Affecting Hydrocarbon Vapor Transport from Leaking Petroleum Storage Tanks to Buildings," examines a hazard that affects many people: how can we safely store fuels?

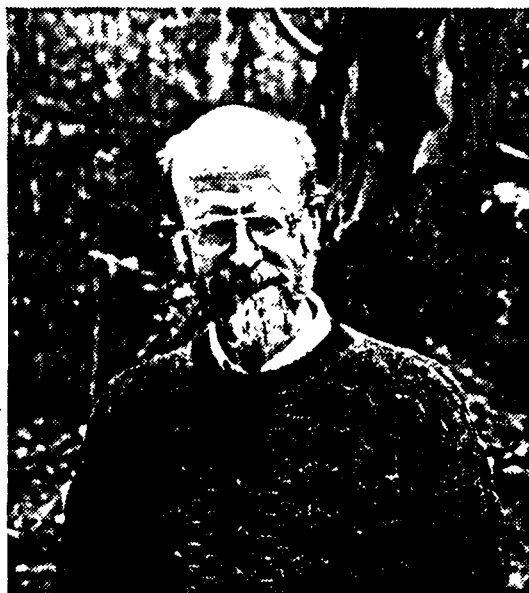
As Tiefenbacher and Chandler argue, the safety of stored fuels in underground tanks depends upon local environmental conditions. Failure to manage these tanks in a manner appropriate to environmental conditions has led to disastrous explosions with loss of life and heavy property damage.

Similarly, a tragic accident happened on 10 June 1999 in Bellingham, Washington. A pipeline owned by Olympic Pipe Line Company spilled gasoline into a stream, which carried it a substantial distance. The gasoline and its vapors then ignited, which killed two boys and a young man who were near the stream. In addition, recent stream restoration efforts were impacted. The cover photo shows the burned riparian areas that were slightly downstream from the spill site.

Everyone is affected emotionally by such accidents, but environmental professionals have a further set of obligations to play a role in local decisions about underground storage tanks. People with education in soils and groundwater hydrology in particular have expertise to offer builders, building owners, and planning and permitting agencies.

The explosion in Bellingham indicates that pipelines are of high interest to many people. Local planners, pipeline regulators, emergency service operators, natural resource managers, and citizens each have an interest in these transport facilities, which will increase as pipelines are expanded.

At a different level, both the Tiefenbacher/Chandler article and the Bellingham explosion indicate that an "environmental systems" issue is also at stake. The economy and culture of the United States are completely dependent upon the movement and storage of vast quantities of petroleum products. *How should we be managing these dangerous materials?* The real problem is that any transport and storage system we can imagine is subject to accident.



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Oil, gasoline, natural gas, and other products are currently moved primarily by pipeline, truck, barge, and ship. Each of these transport methods has had its share of accidents over the years with damages to people, wildlife, soils, waterways, estuaries, and wetlands. The Exxon Valdez accident may be the most memorable, but cumulatively pipeline spills are also significant. In 1998, over 100,000 barrels of crude oil spilled from pipelines with over \$36 million of property damage and one injury.

Considerable political agitation currently surrounds the operation of pipelines, and the Bellingham accident may threaten all proposed expansion plans for pipelines. Pipeline operators and local governments have found themselves at sharply opposite positions on new projects.

Major tragic accidents easily lead to calls for banning new pipelines and tighter regulations of existing lines. Environmental professionals of various kinds can usefully participate in these debates. The following points are those most likely to head the discussion in the right directions.

- *Relative risks of different transport methods are the key issue to understand.* Pipelines and storage tanks are dangerous, but so are alternatives. For example, if hundreds of tanker trucks are to be sent hurtling down the highways instead of sending product through a pipeline, then society will suffer a different set of risks and consequences, not an elimination of risks and consequences. Pipeline spills tend to be big but relatively infrequent. Tanker truck accidents may be more frequent, involve more fatalities and injuries, but spill volumes are lower per incident. What sorts of risks should society and the environment bear? And how should those risks be distributed among social classes and across the landscape? Serious analyses of relative risks are called for on a case-by-case basis.
- *All transport methods require strong regulation at the federal level, a provision for more stringent local regulations, and an effectively educated cadre of regulators working with adequate budgets.* Intensive interstate commerce in petroleum products means the federal government must set the basic standards. But local situations are highly varied physically, biologically, socially, and culturally. State and local authorities need the power to increase the base-line standards set by the federal government.

Regulators need effective training and adequate funds in order to make quality judgments.

- *Transport and civil engineers are necessary but not sufficient for the design and operation of storage and transport facilities.* These facilities require sophisticated engineering, but they also require understanding their impacts on every facet of life. The offices governing these facilities need people educated about soils, hydrology, wetlands, environmental health, environmental justice, and conflict resolution, among others.

Failure to embrace the full challenge of managing the transport and storage of petroleum products will lead to a continuation of accident rates that are too high and arguments about how to improve the system that are too narrow. Such a *status quo* is not acceptable.

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In the next issue of ENVIRONMENTAL PRACTICE

SPECIAL SECTION ON TOXICS

ENVIRONMENTAL REVIEW

Canada's Contribution to the International Reduction of Certain Persistent Organic Pollutants, *S. Gupta & A. Gilman*

COMMENTARY

Persistent Toxic Substances Across the Canada-United States Border: The International Joint Commission and the Great Lakes Water Quality Agreement, *G. Thornburn*

ENVIRONMENTAL REVIEW

Persistent, Bioaccumulative, and Toxic Chemicals in the U.S.-Mexico Borderlands: A Regional Assessment of the Situation, *J. P. Tiefenbacher*

BOOK REVIEWS

Protecting Public Health & the Environment: Implementing the Precautionary Principle, C. Raffensperger & J. Tickner, eds., reviewed by *W. Gullett*

Fish Ecotoxicology, T. Braunbeck, D. E. Hinton, & B. Strett, eds., reviewed by *J. S. Weis*

Sharing the Earth: The Rhetoric of Sustainable Development, T. R. Peterson, reviewed by *M. Meister*

The Politics of Chemical Risk, R. Bal & W. Halfman, eds., reviewed by *B. R. Moyer*

REGULAR CONTRIBUTIONS

RESEARCH ARTICLE

Environmental Consideration in Purchase Decisions of Hong Kong Consumers, *K. Chan*

BOOK REVIEW

Preserving Yellowstone's Natural Conditions: Science and the Perception of Nature, J. A. Pritchard, reviewed by *J. J. Hicks*