

EPA SUSTAINABLE AND HEALTHY COMMUNITIES RESEARCH PROGRAM

Project 3.62 Environmental Releases of Oils and Fuels

Summary

EPA is responsible for assessing environmental releases of oil from multiple sources and fuel from leaking underground storage tanks (LUST). Releases occur in communities throughout the country, affecting water quality, drinking water, and aquatic life, as well as human health through exposure to toxins.

Problem and Key Questions

Effective management of oil and fuel spills is needed via improved protocols and guidelines for establishing new regulations to protect communities from exposures to environmental releases of oils and fuels. Key science questions include the following:

What response products and actions are most effective on likely oil spills in a wide range of environmental settings to minimize environmental and human consequences and to help the affected community and economy recover?

What management, assessment, and/or remediation approaches are needed for minimizing environmental damage and human and ecological exposures from underground tank leakage?

Goals

The project's three overarching goals are to:

- (1) Develop decision-support tools (e.g., models) for determining risk to communities from fuel and oil spills and leaking storage tanks;
- (2) Establish methods and protocols for testing remediation agents listed on the National Contingency Plan (NCP) Product Schedule; and
- (3) Develop new approaches and tools for evaluating exposure to populations and ecosystems and subsequent impact to communities.

The research is designed to deliver results and products that can be used by the Sustainable and Healthy Communities Research program, EPA Program and Regional Offices, and community stakeholders to address and provide sustainable solutions during environmental releases of fuels and oils.

Behavior, Fate, and Effects of Oil and Spill Agents

Advancing oil spill preparation by developing product testing protocols and spill response options, including considerations of sustainability dimensions.

The work will develop:

- a better understanding of the impacts of oil spills' and dispersants' application on the environment;
- a better understanding of the shoreline, coastal, and inland environmental impacts of oil

spills, including non-petroleum oils; and

- innovative, sustainable technologies to mitigate the impact of oil spills.

Protocol Development for the NCP Product Schedule

Synthesis of new or revised protocols for efficacy testing of product categories of the NCP Product Schedule, such as dispersants, surface washing agents, and solidifiers.

The ability to assess the efficacy of spill products improves the effectiveness and timeliness of oil spill response and cleanup activities. Assessment of spill remediation product effectiveness under varying environmental conditions assists in triaging sites for cleanup and the development of tools and approaches to protect community public health and to reduce impacts to community resources.

The work will: (1) advance community sustainability, by protecting and restoring water resources and ecosystems that have been impacted or contaminated by oils or fuels; and (2) improve our understanding of the transport, behavior, fate, and effects of spilled oils. The effort will build on previous work with protocol development, with attention given to product performance using the new proposed EPA reference oils to be selected in FY17 by the Office of

Land and Emergency Management Program Office that maintains the Product Schedule.

Research to Support LUST Program Planning and Backlog Reduction

Understanding, modeling, and remediating contaminant plumes resulting from leaks from leaking underground storage tanks (LUST), and their impacts on buildings and water supplies.

The research will develop:

- improved conceptual models for petroleum plume formation and migration from lab, field, and modeling studies;
- a better understanding of fuel behavior at the water table and impacts to water supply wells from water table fluctuation caused by cycles of drought or climate change; and
- the capacity to identify areas with high density of private wells, potentially leaking tanks, redevelopment sites, and their proximities to water supplies.

Public Health and Ecosystems

Oil spills and LUST sites can impact community public health through contamination of surface and ground waters. These releases add to stressors to communities.

The work will integrate models with mapping environments to provide the spatial context needed for community decision-making. It will integrate site-specific data into mapping environments to assess impacts from actual releases.

The product will also incorporate ecosystem goods and services in evaluating the impact of ecosystem function and its relationship to public health as well as valuation of affected resources.

The product will contribute to assessing remediation and recovery activities and their effectiveness in achieving revitalization within communities.

Key Outputs and Impacts

Output: Tools for improved characterization, response, and remediation of oil and fuel releases to improve emergency response and other cleanup activities.

This output will provide new conceptual and predictive tools to characterize and remediate contamination by fuel releases. It will also provide biological and chemical treatment approaches to improve the effectiveness and timeliness of oil spill response and cleanup activities.

Impact: Improved protocol and guidelines to improve regulations and response efforts to protect communities from exposure to environmental releases of oils and fuels. More efficient and effective management of oil and fuel spills.

Output: Tools for evaluating temporal and spatial impacts of fuels/oils site cleanup on public health and the environment, for use in oil spill response and in site remediation, restoration, and revitalization.

This output will provide tools to support identifying and addressing those impacts through prevention measures and improved response technologies to minimize impacts to their resources.

Impact: More efficient and effective management of oil and fuel spills.

Collaborations

Work conducted through this project is supported through collaboration with the following:

Federal Agencies: National Oceanic and Atmospheric Administration, U.S. Coast Guard, Department of Interior's Bureau of Safety and Environmental Enforcement, and U.S. Geological Survey.

EPA (outside of ORD): Office of Land and Emergency Management's Office of Emergency Management and Office of Underground Storage Tanks, Office of Enforcement and Compliance Assurance, Office of Water, Regions One through Ten.

Regional, State or Other Organizations: State Underground Storage Tank Regulatory Agencies, Association of State and Territorial Solid Waste Management Officials, Interstate Technology Regulatory Commission and Tribes.