



PROJECT ID:
638

Determining BMP Efficacy for Tire Wear Particle Discharge at Navy Facilities



Vehicles at Navy installations can contribute to road-side particulates that ultimately enter stormwater systems and are then subject to regulatory monitoring. (U.S. Marine Corps photo by Lance Cpl. Jack Labrador).

OBJECTIVE

The objective of this collaborative project with Geosyntec is to assess land sources and characterize the stormwater discharge of tire wear particles (TWPs) and associated chemicals from Navy bases and to assess the efficacy of current best management practices (BMPs) at these sites in retaining TWP and associated contaminants of concern [e.g., 6PPD-quinone (6PPDq)].

PROBLEM STATEMENT

TWP contribute chemicals (e.g., 6PPDq) in particulate and dissolved form to surface waters via stormwater, potentially resulting in toxic effects to aquatic species if bioavailable and above species-specific, risk-based thresholds, and/or risking non-compliance for Navy discharges if above emerging regulatory thresholds. Prioritizing its sources of TWP adjacent to sensitive habitats and categorically assessing existing stormwater BMPs for their potential to remove TWPs and 6PPDq is critical for the Navy.

DESCRIPTION

This project involves three main tasks aimed at assessing and improving stormwater management for a specific chemical, 6PPDq, which may pose a risk to water quality:

Task 1: A preliminary study will evaluate whether the Navy is at risk of not meeting Clean Water Act regulations due to 6PPDq in stormwater. This will involve reviewing existing data and regulations, including research from state agencies and previous studies. The goal is to determine if additional infrastructure is needed to control 6PPDq in stormwater runoff. If high-risk areas are identified, the project will proceed to Task 2.

Task 2: A detailed field study will be conducted at least one high-risk Navy site to assess how well current stormwater management practices (known as BMPs) are working. This will involve collecting samples during at least three storm events to measure the concentration of 6PPDq, size fractionation of TWP to determine whether a particular size range of suspended particle is most associated with 6PPDq concentration (this



information can be used to understand treatability by different structural treatment BMP types, and for sediment recontamination potential, since particle size will dictate receiving water settling distance). The findings will help determine whether existing BMPs are sufficient or if upgrades are needed to meet future regulations.

Task 3: The results from Tasks 1 and 2 will be shared through presentations to relevant Navy work groups and managers. The team will provide technical reports, guidelines for evaluating BMP effectiveness, and recommendations for future improvements based on the findings.

Overall, this project aims to ensure that Navy sites comply with future water quality regulations, particularly regarding the chemical 6PPDq, by evaluating current stormwater practices and identifying any necessary improvements.

RETURN ON INVESTMENT

The return on investment (ROI) for this proposal could be significant for the Navy, primarily through cost

savings in stormwater management and regulatory compliance. By identifying effective Best Management Practices (BMPs) and targeting areas where retrofitting or new BMPs are required, the Navy can avoid unnecessary infrastructure investments. The findings from this project could potentially save millions by optimizing BMP installations, ensuring regulatory compliance, and avoiding penalties related to non-compliance with 6PPDq discharge regulations. Additionally, the proactive data collected will guide the Navy in meeting future environmental regulations with the lowest possible costs for both capital and ongoing maintenance.

NAVY BENEFITS

As regulations for TWPs and 6PPDq evolve, efforts focus on enhancing stormwater BMPs, particularly media filtration-based treatments. However, without data on TWP variability and BMP effectiveness, future compliance may require additional studies, pilot testing, and significant costs for BMP implementation and

maintenance. This study will provide key data to help site managers prioritize treatment areas, identify effective BMPs, and avoid unnecessary costs. By optimizing BMP selection and placement, the Navy could save millions on infrastructure and monitoring costs while meeting emerging regulatory requirements.

TRANSITION DESCRIPTION

Key transition activities for this project include delivering a technical report from Task 1, which will be shared with Navy site managers through the Defense Technical Information Center (DTIC). This report will help the Navy navigate future TWP regulations and prioritize BMP retrofits. It will also be shared with consultants involved in BMP implementation. Task 2 results will be disseminated via a peer-reviewed publication and relevant conferences.

CONTACT

For more specific information about this project, contact the Principal Investigator at nicholas.t.hayman.civ@us.navy.mil



ABOUT THE NESDI PROGRAM

The Navy Environmental Sustainability Development to Integration (NESDI) program is the Navy's environmental research and development demonstration and validation program, sponsored by Office of the Chief of Naval Operations (OPNAV) Compliance and Mission Readiness Division (N411) and managed by the Naval Facilities Engineering Systems Command (NAVFAC) from the Engineering and Expeditionary Warfare Center (EXWC) in Port Hueneme, CA.

The mission of the NESDI program is to support Fleet readiness by minimizing operational constraints associated with environmental and human health risks and to reduce cost of environmental compliance by demonstrating, validating, and integrating innovative technologies, processes, materials, and by filling knowledge gaps.

For more information, visit the program's web site at www.navfac.navy.mil/nesdi or contact the NESDI Program Managers at NESDI@us.navy.mil