Mobile Protected Firepower (MPF)

Life Cycle Environmental Assessment (LCEA)

August 2021

Prepared by:

Project Manager (PM) Mobile Protected Firepower (MPF)

MPF Life Cycle Environmental Assessment

August 2021

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Executive Summary

This Life Cycle Environmental Assessment (LCEA) has been developed by the United States (US) Army in accordance with the National Environmental Policy Act (NEPA) of 1969 as amended; the President's Council on Environmental Quality (CEQ) regulations for Implementing NEPA (Title 40 Code of Federal Regulations (CFR) Part 1500-1508); and 32 CFR 651, Environmental Analysis of Army Actions (Army Regulation (AR) 200-2); Final Rule dated March 29, 2002, which implements NEPA and CEQ regulations. Its purpose is to inform decision-makers, fielding facilities, and the public of the potential environmental consequences of the proposed action and alternatives.

The proposed action is the execution of the Mobile Protected Firepower (MPF) Program which includes production, testing, training, initial fielding, operation, maintenance, and demilitarization and disposal (D&D). The purpose of the MPF system is to support infantry brigade combat teams (IBCTs) with protected, long range, precision direct-fire capability to neutralize enemy prepared positions, bunkers, and armored threats. The MPF fills a capability gap identified by the Army within the IBCT. The MPF program is being delivered on an accelerated timeline using rapid prototyping. In December 2018, the US Government awarded competitive contracts to two vendors, BAE Systems Land and Armaments, L.P. and General Dynamics Land Systems, Inc., to design and deliver 12 MPF prototype vehicles each prior to September 2020. The prototypes will undergo test and evaluation to verify the vehicles meet government requirements and to inform selection of a single vendor to produce the production MPF vehicle. Following this down selection, the MPF program will enter the traditional acquisition lifecycle by moving into the Production and Deployment phase in 2022. The Army currently plans to produce approximately 500 MPFs over a period of 10 years with vehicles fielded to units between fiscal year (FY)25 and FY35.

This LCEA documents *specific* environmental effects for activities for which the MPF program is the proponent, including system design and testing, system production, initial fielding, new equipment training (NET), development of maintenance instructions, and D&D. *General* effects expected after the vehicles have been released for the unit as a consequence of training, operation, and maintenance are also considered. Environmental Resource Area (ERA) analyses include air quality, water quality, soil resources, land use, socioeconomics, hazardous materials, hazardous wastes, noise, biological resources, cultural and historical resources, and public health and safety are compared to the No-Action Alternative. Some ERAs may require additional, site-specific NEPA analyses based on the unique environmental conditions.

Specific environmental effects and programmatic general effects associated with MPF are anticipated to be negligible or minimal. Careful adherence to federal, state, military and local environmental regulations; installation processes, including spill contingency plans and pollution prevention plans; and procedures for testing, training, operation, maintenance, and D&D should preclude any potential significant environmental impacts associated with execution of the Proposed Action. Additionally, there are no Executive Order (EO) 12898 Environmental Justice concerns resulting in disproportionately high and adverse human health and environmental effects on minority or low-income populations. As a result, preparation of an Environmental Impact Statement (EIS) is not required and a Finding of No Significant Impact (FoNSI) has been prepared and included in APPENDIX E of this assessment. This environmental assessment (EA) and FoNSI were made available to the public for a 30-day review period.

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1 Introduction

The Mobile Protected Firepower (MPF) system is a US Army acquisition program managed by Project Manager (PM) MPF under the direction of the Program Executive Office, Ground Combat Systems (PEO GCS). PM MPF is responsible for all Environmental, Safety and Occupational Health (ESOH) requirements for the MPF program. PM MPF has completed this Life Cycle Environmental Analysis (LCEA) in accordance with 32 Code of Federal Regulations (CFR) Part 651 Environmental Analysis of Army Actions to comply with the National Environmental Policy Act (NEPA) of 1969 as amended, the President's Council on Environmental Quality Regulations for Implementing NEPA (40 Code of Federal Regulation Parts 1500-1508). This LCEA addresses the potential MPF environmental impacts related to production, testing, training, fielding and operation, maintenance, and demilitarization and disposal (D&D) of the MPF system.

2 Document Scope

In accordance with (IAW) 32 CFR 651 Environmental Analysis of Army Actions, this LCEA will document *specific* environmental effects for activities for which the PM is the proponent and the *general* effects of all aspects of the MPF program. PM MPF is the proponent for acquisition of the MPF system, including system design and testing, system production, initial fielding, new equipment training (NET), development of maintenance instructions, and D&D. Once vehicles have been released to the units and NET has concluded, units will assume proponency for subsequent training, operation, and maintenance. This LCEA will also compare the environmental effects of the proposed action to the No-Action Alternative.

The MPF program is early in the acquisition process, and specific design details have been generalized to maintain the integrity of competitive prototyping further described in Section 4.1. Impacts to Environmental Resource Areas (ERAs) reviewed include air quality, water quality, land use and soil resources, socioeconomics, hazardous materials and wastes, noise, biological resources, cultural and historical resources, and public health and safety. Some ERAs may require additional, site-specific NEPA analyses based on unique environmental conditions or specific activities conducted at hosting installations. Site personnel are responsible for identifying unique environmental aspects and determining whether additional NEPA documentation is required.

If required, site-specific NEPA documentation will be completed in accordance with the Army requirements detailed in 32 CFR 651. Analysis and documentation can be accomplished through application of a Categorical Exclusion (CX) documented in a Record of Environmental Consideration (REC); a supplemental Environmental Assessment (EA), if specific issues need further analyses; or an Environmental Impact Statement (EIS), if site-specific impacts appear significant. For site-specific NEPA documents, the applicable analyses within this LCEA can be incorporated by reference rather than duplicated. Should significant future modifications be made to the MPF system resulting in impacts not addressed in this LCEA, additional NEPA analyses and documentation may be required in the form of a REC, supplemental EA, or EIS.

Site-specific NEPA analyses have been documented for test phase activities, which are discussed in more detail in Section 4.4. Consequently, this LCEA discusses their general effects rather than their specific effects. Developmental testing (DT) events will be conducted at Army test facilities which routinely carry out tests of similar scope and magnitude. The test facilities maintain compliance with NEPA through EAs or EISs which evaluate the impacts of the tests they conduct. For each MPF test, the Test Center will generate a REC and NEPA checklist to document the projected environmental impact of each specific test activity and any recommended suitable mitigations. Additional environmental documentation is not anticipated to be required at DT sites. For the Soldier Vehicle Assessment (SVA) and Limited User Test (LUT), both operational test (OT) events, environmental effects are categorically excluded under 32 CFR 651, which Fort Bragg documented in a REC dated 3 July 2019.

The MPF system requires a number of support vehicles discussed in Section 4.2 which will be added to the receiving installations. These support vehicles are not new and have their own NEPA documentation. Environmental effects which would result from their use as support to MPF are evaluated in this LCEA as *indirect* effects.

For this LCEA, environmental impacts resulting from the proposed action and the No-Action Alternative are evaluated based on their severity and context and characterized as negligible, minimal, or significant.

- **Negligible** - an environmental impact could occur but will have no noticeable or detectable effect on the resource area.
- **Minimal** - an environmental impact could occur and is readily detectable but is clearly less than significant, is temporary, or is mitigated to reduce the adverse impacts to less than significant.
- **Significant** - an adverse environmental impact which, given the context and intensity, violates or exceeds regulatory or policy standards, would substantially alter the function or character of the resource area, or otherwise meets an identified threshold.

Executive Order (EO) 12114, Environmental Effects Abroad of Major Federal Actions (January 1979), requires federal agencies to analyze the potential environmental effects of major federal actions outside the United States IAW existing foreign policy and national security requirements. The types of analysis and documentation required by EO 12114 for non-wartime operations are similar to those required by NEPA. This LCEA satisfies these EO 12114 requirements for planned peacetime fielding abroad. Wartime missions are exempt from EO 12114 requirements.

Upon completion, the findings of this LCEA will be published in a public notice and be available for a 30-day public review.

3 Purpose and Need for MPF Program

The MPF fills a capability gap identified by the Army within the Infantry Brigade Combat Team (IBCT). The MPF provides protected, long range, precision direct fire capability to neutralize enemy prepared positions and bunkers and defeat heavy machine guns and armored vehicle threats during offensive operations or when conducting defensive operations against attacking enemies. Specifically, the MPF will enhance the IBCT's ability to seize, retain and exploit the initiative and to gain and maintain a position of relative advantage in sustained land operations. The MPF will support the full range of military actions conducted by the IBCT, moving rapidly in a variety of terrain conditions, negotiating soft ground, shallow trenches, small trees, and limited obstacles. This will enable the IBCT to move freely, create breach points and set the offensive pace. Overall, the MPF will enhance the IBCT's ability to assault by fire and maneuver through urban and restrictive terrain to seize, occupy, and defend land areas, increasing the lethality and survivability of Army light infantry forces. Ultimately, its use will prevent or deter conflict and create the conditions for favorable conflict resolution.

4 Description of the Proposed Action

4.1 Program Overview

MPF will deliver an essential new capability to the IBCTs within an accelerated timeline. In accordance with §804 of the National Defense Authorization Act of Fiscal Year 2016 (Publ. L. 114-92), the MPF will proceed through a rapid prototyping phase where existing technologically mature vehicle powertrain systems, suspension, armor, weaponry, and electronics will be leveraged and integrated to meet operational requirements in a shorter time with reduced costs compared to traditional acquisition programs.

In December 2018, the US Government awarded competitive contracts to two vendors, BAE Systems Land and Armaments, L.P. (BAE) and General Dynamics Land Systems, Inc. (GDLS), to design and deliver 12 MPF prototype vehicles each prior to September 2020. The prototypes will undergo test and evaluation to verify the vehicles meet government requirements and to inform selection of a single vendor to produce the MPF production vehicle. Following this down selection, the MPF program will enter the traditional acquisition lifecycle by moving into the Production and Deployment (PD) phase in 2022.

The PD phase will begin with production of a limited number of MPF vehicles during Low Rate Initial Production (LRIP), from approximately FY22 to FY25. LRIP will be used to evaluate whether the system's design is ready for production and to establish the contractor's initial production capability. Once LRIP is complete, the program will move into Full Rate Production (FRP). PM MPF plans to award a fixed-price FRP contract with incentives for the vendor to continue to improve reliability, availability, maintainability and cost. The Army currently plans to produce approximately 500 MPFs over a period of 10 years with vehicles fielded to units between FY25 and FY35.

4.2 MPF System Description

The MPF will be a highly mobile, multi-terrain, armored tracked vehicle with direct-fire capabilities. The MPF will be a single-variant vehicle and will provide seating for a minimum of three operating crew to include a commander, gunner and driver. Since prototype designs are unique to each vendor, specific vehicle details will be unknown until the production contract is awarded. In order to preserve the competition, design details in this LCEA are based on requirements the Government included in their Request for Proposals or are generalized based on similar vehicles.

The overall size of the MPF is dictated by transportability requirements. Two MPFs must be transportable in an operational, drive-on/drive-off configuration in a single C-17 aircraft and allow unrestricted highway, rail, and marine transport worldwide. Transport constraints limit the MPF's physical dimensions and its weight to approximately 42 tons. Without a final design, exact dimensions are unknown. Conservative estimates based on transport constraints are provided in Table 1. Actual dimensions will likely be smaller. The attribute values in Table 1 will be used for the purposes of analysis in this EA.

Table 1: MPF System Description

MPF System Characteristic	Approximate Attribute Limits
Weight	42 tons
Width	144 in.
Height	113.6 in.
Chassis Length	312 in.

The MPF will be designed with a large caliber main gun and a coaxial weapon. MPF vehicles will also be capable of accepting a unit-issued machine gun. The MPF vehicle will include a suite of integrated network enabled communications, scalable armor protection, and full-time situational awareness capabilities. The MPF will be equipped with an automated fire extinguishing system (AFES) and will be shielded to minimize or eliminate Electromagnetic Environmental Effects (E3).

The MPF system will rely on fuels, oils, and lubricants of the same specification as other weapon system platforms within the IBCT to leverage existing logistics chains. The MPF is also expected to be capable of cooling the crew compartment, requiring the use of refrigerants in an air conditioning system. Table 2 provides the military specification/standard for vehicle fluid materials and approximate capacities based on similarly sized existing platforms. Specific fluid capacities and applicable military standards / specifications will not be known until LRIP.

Table 2: Vehicle Fluids & Expendable Materials Specifications and Approximate Capacities

Description	Capacity	Military Specification / Standard
JP 8/Jet Fuel A (Primary)	175 gallons	MIL-DTL-83133J
Diesel Fuel DF-2 (Secondary)	175 gallons	ASTM D 975
Fuel NATO F-24 (Secondary)	175 gallons	NE-14-28
Engine Coolant	25 gallons	CID A-A-52624A
Engine Oil	10 gallons	MIL-PRF-2104M MIL-PRF-46167
Gear Oil	12 quarts	MIL-PRF-2104M MIL-PRF-46167 SAE J2360 SAE 80W-90
Transmission Fluid	23 gallons	MIL-PRF-2104M MIL-PRF-46167

Description	Capacity	Military Specification / Standard
Hydraulic Fluid	15 gallons	MIL-PRF-46170E MIL-PRF-5606
Various Greases	20 gallons	MIL-PRF-10924H MIL-G-81827 MIL-DTL-23549 MIL-PRF-81322 MIL-G-21164

The MPF will operate on primary roadways, secondary roadways, and cross-country. Primary and secondary roadways are hardened surfaces subject to periodic maintenance. This includes surfaces ranging from paved, high speed roads in excellent condition to rutted and pot-holed gravel roads. Cross-country terrain includes, but is not limited to, deserts, grasslands, sand, swamps, forests, tropical jungles, mountains, shallow rivers, and saltwater beaches. The design will be required to achieve 15 pounds per square inch ground pressure or less to ensure mobility in these environments. Missions are anticipated to be approximately 20% primary road, 35% secondary road, and 45% cross country. As of LCEA development, doctrine has not been developed to identify the percentage of training to be conducted on each type of surface; however, it can be reasonably assumed that training will reflect mission characteristics.

The exact design of MPF units has not yet been determined. There are currently two primary options. The first approved option is to equip one Cavalry Troop within a Cavalry Squadron with 14 MPF vehicles. Support equipment including one M1075 Palletized Load System, one M978 Heavy Expanded Mobility Tactical Truck (HEMTT) fueler, two M1152A1 maintenance contract trucks, and one M88A2 recovery vehicle to replace the HEMTT wrecker would be distributed to the Cavalry Delta Troop in each Cavalry Squadron. In this option, three or fewer squadrons at any given installation would receive MPFs. The second option is currently under review for approval and would combine three MPF Companies in a single MPF Battalion. In this case, the MPF Battalion would be assigned roughly three times the support equipment mentioned, above and no more than one battalion at a given installation would receive MPFs.

4.3 Production

During rapid prototyping, 14 prototypes will be produced by each competing contractor. BAE will subcontract Loc Performance Products, Inc. to produce hulls and turrets using facilities in Lapeer, Lansing, and Plymouth, MI and assemble the final prototype vehicles at their Sterling Heights, MI facility. GDLS will subcontract Merrill Manufacturing to produce the hulls and turret plates in Alma and Merrill, MI and fabricate turrets at the Joint Systems Manufacturing Center (JSMC) in Lima, OH. Prototype vehicles manufactured by GDLS will be assembled in Sterling Heights and at JSMC.

The MPF production location will not be known until final selection of the manufacturer prior to LRIP in 2022. The contractor selected for LRIP will continue production into FRP. The selected contractor may use a different facility for production than used for prototype manufacture. LRIP

is expected to be conducted for three years followed by a 10-year FRP cycle. All prototype and production vehicles will be manufactured and assembled in accordance with federal, state and local environmental laws and regulations.

4.4 Testing and Evaluation

The MPF Test and Evaluation strategy is designed to verify that vehicles meet government requirements and that the MPF solution successfully fills the capability gaps which led to its development. DT and OT are comprised of test activities already evaluated in existing site-specific EAs and EISs. Test sites will need to complete RECs citing the applicable EA or EIS that evaluated these actions. Testing will include the use of up to 50 vehicles and will be conducted FY20 through FY25.

4.4.1 Developmental Testing

Developmental testing will focus on verifying vehicle performance against the awarded government specifications. During rapid prototyping, developmental testing will provide data on safety, assess whether contractors are meeting their performance requirements, and allow for determination of technical risk. These results will guide selection of a single production contractor. In the PD phase, developmental testing will be used to verify and assess the performance requirements, measure manufacturing reproducibility, and determine the adequacy of any corrective actions required due to previous test results. DT will include ballistic testing, performance testing, lethality testing, Reliability, Availability, and Maintainability (RAM) testing, E3, cybersecurity testing, logistics demonstration, and live-fire testing.

Up to 25 vehicles will be used for DT, but most DT events will be conducted with one to two vehicles. Test facilities planned for DT include Aberdeen Proving Grounds (APG) in Aberdeen, Maryland; Yuma Proving Grounds (YPG) in Yuma, Arizona; White Sands Missile Range (WSMR) in New Mexico; Fort Hood in Killeen, Texas; Army Engineer Research and Development Center (ERDC) in Vicksburg, Mississippi; and Cold Regions Test Center in Alaska (winter testing only). Overall DT is expected to occur intermittently during FY20 though FY25 with a combined total of approximately 22,500 miles among test vehicles.

4.4.2 Operational Testing

During OT, soldiers operate the vehicles in realistic mission environments to assess how well the MPF meets its designated objectives described in Section 3. OT will also be used to support the decision that the vehicles are ready to be released to soldiers. OT events include SVA, LUT and Initial Operational Test and Evaluation (IOT&E) and will use approximately 30 vehicles total.

Each contractor will provide four MPF vehicles for SVA. During SVA, soldiers will be issued MPFs for free-play training. The SVA will provide operational feedback on how to use MPF in an IBCT environment and will inform development of Tactics, Techniques, and Procedures. The SVA is planned for execution at Fort Bragg, North Carolina during FY21. Live-fire events during the SVA will be conducted at Fort Stewart, Georgia.

The LUT will immediately follow SVA at Fort Bragg using five vehicles per vendor. The LUT will realistically replicate the operational environment of the IBCT and assess the capabilities and limitations of the system. The LUT will also include a live-fire gunnery exercise at Fort Stewart using a range of targets and conditions and force-on-force infantry training missions.

The objective of the IOT&E is to evaluate whether production-representative MPF vehicles adequately address the capability gaps identified by the Army. In addition, IOT&E will evaluate the IBCT's ability to support the MPF. Results from this test event will be used to determine whether the vehicle is ready to move into FRP. IOT&E is planned for fourth quarter FY24 through first quarter FY25 with up to 13 vehicles. This event will be conducted at an undetermined IBCT location.

4.5 Training

The MPF program is the proponent for training prior to test events, training for instructors and key personnel, and NET provided when vehicles are first delivered to receiving installations. The MPF program is responsible for the development, publication and distribution of all Training Support Products with guidance from the Army Training and Doctrine Command (TRADOC). Mission-level training completed at installations will be the responsibility of those installations.

4.5.1 Rapid Prototyping Phase Training

During rapid prototyping DT, each contractor will train MPF testers to operate the vehicles. During DT events, maintenance will be performed by Field Support Representatives (FSRs) from each contractor; therefore, maintainer training will not be required. Prior to OT events, each contractor will similarly provide NET for operators. This NET will include operator maintenance tasks, such as Preventive Maintenance Checks and Services (PMCS). All other maintenance will be completed by FSRs, precluding the need for maintainer training. Training during the rapid prototyping phase will be completed at test sites.

4.5.2 PD Phase Training

Tester training will be completed prior to the start of PD phase testing. The training activities will occur at existing ranges and maneuver areas on Army installations.

4.5.2.1 New Equipment Training

During the PD phase, PM MPF will work with the selected MPF contractor to provide initial training for staff at receiving installations to safely operate and maintain the vehicle. Operator NET will include capabilities, functions and operations of the systems, preventive and corrective maintenance procedures, terrain/obstacle driving, and authorized self-recovery procedures. Maintainer NET includes capabilities, functions and operation of the system, preventive and corrective maintenance procedures, external diagnostics and other tests, performance of system checks and verification procedures, measured performance data and vehicle recovery procedure. NET will be based on digitized training materials, lesson plans and technical manuals provided by the MPF program and will also include safety-related items and procedures for handling environmental hazards, should they exist.

Operator and maintainer NET will be conducted at fielding sites per the MPF Fielding Plan. See section 4.5.2.4 for further description of training infrastructure improvements that may be required to support NET.

After the unit receives the vehicles and NET, the unit/owning command will assume responsibility for unit sustainment, including training for incoming crews and maintainers and mission-level training and exercises. PM MPF and the contractor will deliver a Training Support Package

following NET including training materials to meet the unit Commander's sustainment training effort.

All training will occur on existing military installations. For locations already hosting similar systems, existing infrastructure will likely be adequate for NET. However, some installations which do not currently host tracked vehicles may need to construct or improve maneuver areas, tank trails and low water crossings to facilitate operations and NET. In these instances, the training site will evaluate environmental impacts in a site-specific NEPA document.

The MPF will train on existing live-fire range facilities that accommodate multiple weapons systems' training. The Army considers MPF training requirements as well as all current installation training requirements when making decisions to construct new live-fire facilities. All new live-fire range construction and modernization (including but not limited to construction to support MPF training) receives site-specific NEPA analysis.

4.5.2.2 Institutional Training

Institutional training is training conducted at Institutional training centers and schoolhouses for new crew members and maintainers once the unit has assumed possession of the vehicle. In this case, users new to the vehicle are arriving into the unit after the PM's NET has concluded. This training provides the users with initial training fundamentals needed to understand the operation and maintenance of the MPF. Institutional training also educates future trainers and other key personnel on vehicle operation/maintenance. Distance learning, simulations, and Synthetic Training Environments as well as hands on training will be used during Institutional training.

MPF operator and maintainer specific training will be added to institutional training following the initial MPF fielding. Operator and maintainer training will be completed at Fort Benning and is expected to be conducted at existing facilities.

4.5.2.3 Mission-Level Training

Mission-level training includes all training undertaken by the unit after conclusion of NET. For the purposes of this EA, mission-level training is considered and evaluated as part of operations. Operations are further discussed in Section 4.6.

4.5.2.4 Training Infrastructure

All training will occur on existing military installations. For locations already hosting similar systems, existing infrastructure will likely be adequate for NET. Some installations, however, do not currently host tracked vehicles and may need to construct or improve maneuver areas, tank trails and low water crossings to facilitate operations and NET. In these instances, the training site will evaluate environmental impacts in a site-specific NEPA document.

At this time, the MPF program does not anticipate new construction or upgrades to live-fire ranges, although there may be a need to improve/modify existing ranges. Current guidance indicates that in most cases where live fire ranges are unavailable, MPF systems and crews will be transported to existing ranges for qualification activities. If live-fire range construction is required, the environmental impacts would be evaluated in a site-specific or supplemental programmatic NEPA document.

4.6 Initial Fielding and Operation

The final schedule and fielding locations are not known at this time, but fielding is anticipated to extend from 2025 to 2035. Anticipated fielding locations include home stations for IBCTs within the U.S. and abroad across the Active Army and possibly the Army National Guard (NG). Proposed fielding locations at the time of writing include the following:

- Ft. Bragg, NC;
- Ft. Campbell, KY;
- Ft. Drum, NY;
- Camp Ederle, IT/Grafenwoehr, GER;
- TRADOC/Ft. Benning, GA;
- Joint Base Elmendorf-Richardson, AK;
- Ft. Polk, LA;
- Scofield Barracks, HI; and
- NG IBCTs (NY, WI, IA, IL, OH, KY, AR, OR, OK, GA, HI, NJ, FL, TX, LA, CA, VT, VA, IN, and PA).

PM MPF is responsible for initial fielding of the MPF, which includes transportation to the gaining installation and de-processing upon arrival. Transportation of the MPF will use a combination of semi-truck/trailer, rail car, aircraft, and/or marine transport vessels. PM MPF will provide a fielding team to assist in unloading the MPFs and transporting them to secure storage areas. Receiving units will provide adequate de-processing facilities. Within this LCEA, de-processing means the necessary maintenance activities and final integration of components on the MPF prior to the units receiving the equipment. De-processing will occur prior to the units receiving the MPF for official use.

Once vehicles have been released to the units and NET has concluded, units will be responsible for on-site MPF operations, which are expected to include on-going mission-level training exercises, regular maintenance and storage. Mission-level training may include maneuver and vehicle operation, realistic gunnery, mission rehearsals and tactics, sustainment and maintenance training, and would generally be completed under the guidance of a trained Non-Commissioned Officer.

At the time of writing, MPF peacetime training and operation doctrine has not been fully developed. Doctrine is expected to mature as the program develops. In the absence of doctrine, it is reasonable to assume that the overall usage rates will be similar to other tracked combat vehicles. For the purposes of this LCEA, annual usage is assumed to be similar to the Armored Multi-Purpose Vehicle (AMPV), which is projected to average approximately 3,500 miles per vehicle per year.

Some IBCT home stations either currently or have recently operated tracked vehicles, while others have not. Where tracked vehicles have recently operated, existing infrastructure is likely sufficient to support MPF; however, at many locations infrastructure upgrades or new construction will be required to operate and support the MPF system effectively. Improvements may include hardening bridges, upgrading training areas or tank trails, and/or upgrading storage and maintenance facilities. Site improvements, if required, will also result in corresponding revisions to site specific permits and environmental protection plans.

4.7 Maintenance

The Army will use field level and sustainment level maintenance to support the MPF. In general, most maintenance activities will be similar to those performed on wheeled vehicles, with slight variations since MPF is a tracked combat vehicle. Maintenance levels and associated services are typically defined as follows:

- **Field**: Field level maintenance is performed by individual or supporting units on their own equipment in maintenance facilities, motor pools, mobile shops or tactical environments. Field maintenance involves PMCS, troubleshooting and assessment, field-level modification work orders, fault and failure diagnoses, battle damage assessment, repair or replacement of damaged or unserviceable parts and fabrication of critical unavailable parts.
- **Sustainment**: Sustainment level maintenance will be performed at service depots and/or commercial industrial facilities. Sustainment level maintenance involves major repair, overhaul or a complete rebuild of parts, subassemblies, assemblies or principal end items. Sustainment maintenance includes manufacturing parts, performing equipment modifications, testing, calibrating, reclaiming and painting.

During test events, BAE and GDLS will provide maintenance and supply support, largely through FSRs. The MPF program will transition from contractor support to Government support for maintenance prior to fielding. The vendors and the MPF program will develop, provide and update MPF Technical Manuals which provide step-by-step instructions for field-level and sustainment-level maintenance and repair of the MPF. Additionally, the MPF will use the current logistics and maintenance structure established for Army equipment with repair parts available through the established supply system. As mentioned in Section 4.6, new and/or upgraded maintenance and storage facilities are anticipated at some fielding locations.

4.8 Demilitarization and Disposal

At the end of its service life, all MPF systems will undergo D&D. Demilitarization is the act of rendering the military capabilities unusable through removal or destruction. Vehicles are disposed through destruction, sale, recycling, transferring, donating or redistributing the materiel according to its salvage value. At the time of this writing, a D&D plan specific to the MPF has not been developed.

The vehicle's useful life is often assumed to be 26 years from the date of fielding, but the exact lifecycle duration of the MPF is unknown. Defense Logistics Agency (DLA) Disposition Services will manage the D&D process, which will be completed either at government depots or civilian contractor facilities. MPF parts and components will be recycled or reused to the greatest extent possible as determined by existing laws and regulations at that time. Any remaining waste items will be disposed of in accordance with applicable federal, state, Department of Defense (DoD), and local guidelines. D&D for the MPF system will be completed according to the system specific MPF Demilitarization and Disposal Plan, and conducted IAW DoD Manual (DoDM) 4160.21, Defense Materiel Disposition and DoDM 4160.28 Defense Demilitarization.

During D&D, MPF systems will be stripped of easily removable components that will be retained, disposed of or further demilitarized. System fluids such as motor oil, fuel, refrigerant, hydraulic and transmission fluids will be drained into specified containers and recycled or disposed of according to applicable regulations. The remaining vehicle structure will be broken down while collecting and segregating components for disposal that may contain hazardous materials such as

hexavalent chromium, cadmium or beryllium. Rubber materials, power packs, fuel cells, and batteries will also be removed and segregated for proper disposal. When possible, these materials will be reused. Hulls and turrets will require torch and mechanical cutting according to established procedures which minimize risks to workers and the environment.

5 Proposed Alternatives

The Army identified the need to equip the IBCTs with protected, long range, precision fire capability. The IBCT requires increased firepower that will work in concert with its current materiel providing engagement options that will effectively and swiftly defeat threats during offensive or defensive operations. An Analysis of Alternatives (AoA) was completed in September 2017 to evaluate possible solutions to address IBCT mission capability requirements.

5.1 Preferred Alternative

The AoA identified the MPF solution as described in Section 4 as the preferred alternative to meet IBCT mission requirements. The MPF provides an upgrade in firepower, mobility, navigable terrain, and armored engagement. Equipped with the MPF, the IBCT's ability to assault, maneuver through restrictive terrain, seize, occupy and defend is enhanced. Further, adding the MPF capability to the IBCT force structure will allow IBCTs to defeat enemy threats earlier in the fight and at greater range without taking longer to deploy, thereby reducing soldier exposure and casualties. No systems considered in the AoA better met IBCT mission requirements than the preferred alternative.

5.2 Alternatives Considered but Eliminated

The AoA also considered existing or upgraded currently fielded systems. A wheeled system similar to the Stryker Mobile Gun System was considered. A tracked system consisting of a Main Battle Tank turret, large caliber gun, and an Infantry Fighting Vehicle hull was also considered. These alternatives were rejected because they did not meet multiple transportability, mobility, logics, survivability, and lethality requirements.

5.3 No-Action Alternative

The No-Action Alternative is prescribed by the CEQ regulations and serves as a benchmark against which federal actions can be evaluated. The No-Action Alternative refers to proceeding with mission objectives with current capabilities without the implementation of the Preferred Action or Proposed Alternatives. Therefore, the No-Action Alternative would result in the Army continuing to rely on existing assets within the IBCT to complete military operations. The MPF Initial Capabilities Document evaluated non-materiel solutions and concluded they would be unacceptable to fill capability gaps. Although the No-Action Alternative is not a viable option, this LCEA includes evaluation of the No-Action Alternative as a baseline for comparison to the Proposed Action.

6 Affected Environment and Environmental Consequences

This section broadly discusses environmental resource areas potentially impacted by implementation of the Proposed Action and considers reasonably anticipated environmental effects. The affected environment of the proposed action includes Army and industrial locations where production, testing, training, fielding and operation, maintenance, and D&D occur as described in Sections 4.2 through 4.8. As discussed in Section 2, specific analysis for activities of which the PM is a proponent to include system design, production, testing, training (tester training, NET, and institutional training), initial fielding, development of maintenance instructions and D&D. For actions beyond the PM's responsibility such as mission-level training, operation, maintenance and storage, a general overview identifying likely environmental impacts are considered.

This section provides a review of potential environmental consequences of the Proposed Action and the No-Action Alternative by Environmental Resource Area (ERA). Recommendations are provided for practical mitigations to minimize the potential environmental consequences when applicable. ERAs discussed include the following.

- Air Quality;
- Water Quality;
- Land Use and Soil Resources;
- Socioeconomics;
- Hazardous Materials and Wastes;
- Noise;
- Biological Resources;
- Cultural and Historical Resources; and
- Public Health and Safety.

6.1 Air Quality

Air quality refers to the degree to which ambient air in a given area contains hazardous air pollutants (HAPs), volatile organic compounds (VOCs), ozone depleting chemicals (ODCs), greenhouse gases (GHGs), Clean Air Act criteria air pollutants (sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead and particulate matter (PM_t)), and other chemical contaminants. Some indicators of poor air quality may include smog, smoke, or odorous emissions. Other indicators like acid rain or elevated GHGs may be less obvious.

6.1.1 Existing Conditions

Multiple air sheds make up the affected environment above and surrounding production, testing, training, initial fielding and operation, maintenance and D&D locations. Air quality at Army installations and vendor production facilities varies by location across the nation. Both Army installations and vendor production facilities have stationary and mobile sources of air emissions. Most Army installations hold air permits that require periodic air emissions monitoring. Permits held by Army and industrial facilities are a function of the equipment and quantity of criteria pollutants and HAPs emitted and may be administered by federal, state, or local regulatory agencies. In addition to permits, other air quality regulations (e.g., dust suppression during construction activities) may also apply. Contracts with BAE and GDLS require compliance with environmental statutes, including those that regulate air emissions.

6.1.2 Environmental Consequences

This section provides a discussion of the possible environmental impacts to air quality that could result from the Proposed Action and No-Action alternatives. Impacts to air quality would be considered significant if the Proposed Action would result in a National Ambient Air Quality Standards (NAAQS) attainment area becoming a nonattainment area, a violation of Clean Air Act (CAA) Title V operating permits or synthetic minor permit, or generation of substantial Green House Gas (GHG) emissions nationwide (> 650,000 metric tons carbon dioxide (CO_2) equivalents per year).

6.1.2.1 Proposed Action

Evaluation of the effects of the proposed action on air quality are discussed below and organized by program phases. Phases with similar impacts are grouped to avoid repetition.

Production

Impacts from production are expected to be minimal and are characteristic of large corporations engaged in vehicle manufacture in compliance with local, state, and federal air regulations and permits. Minimal air quality impacts are expected from use of solvents and sealants, Chemical Agent Resistant Coating (CARC) application, and initial charging of AFES and refrigerant equipment. Because the production contractor has not yet been determined, analysis of the production phase is limited to BAE and GDLS's prototype manufacturing with reasonable assumptions extended to full-scale manufacturing.

Both vendors are large corporations currently producing systems of similar scale with existing manufacturing facilities. Construction of new manufacturing facilities is not expected to meet production demands for prototype or full-scale production, which is limited to 54 vehicles per year. If new facilities were required, they would likely be constructed in an existing industrial area.

Current BAE and GDLS production facilities are subject to the CAA and state and local air permits which limit air emissions. Per contractual requirements, the vendor is responsible for compliance with applicable environmental laws and regulations, including securing and adhering to air permits for production activities. BAE and GDLS and their subcontractors plan to use production facilities located in Lansing, Lapeer, Sterling Heights, and Plymouth, Michigan and Lima, Ohio for prototype production. For production vehicles, it can be reasonably assumed that manufacturing and system assembly will occur at existing production facilities that currently produce similar systems using similar techniques and processing.

Manufacturing processes would be expected to include forging, forming, casting and machining of metals and alloys; custom fabrication and fitting; and assembly of subcomponents to create a complete system. These processes require general cleaning and degreasing, precision cleaning, abrasive blasting, cutting, grinding, welding, chemical pretreatment, plating, priming and painting. Some generation of criteria pollutants and HAPs, including various VOCs, metals and heavy metals vapor, hydrochloric acid, sodium hydroxide, oxides of nitrogen (NO_x) and sulfur (SO_x) and airborne inorganic and organic particulate matter, is expected during this process. In addition to primary component fabrication, system assembly would require use of adhesives, sealants, thread-lockers and anti-seize agents – many of which contain HAPs and possibly heavy metals. Administrative and engineering controls within the production and assembly facilities such as specific handling, storage, ventilation, scrubbing, air pollution control devices, maintenance and disposal within federal, state and local standards and permits limit the potential for criteria

pollutants and HAPs to be released to the environment outside the facility. Consequently, these potential impacts are considered minimal.

Raw metal surfaces will be finished with coatings to prevent corrosion. For military vehicles, CARC is used rather than commercial paint. Potential CARC air emissions are similar to those for commercial paints. CARC primers and topcoats contain isocyanates that, when airborne, can irritate the eyes, skin, throat and mucous membranes and may inhibit proper respiratory function or cause acute pulmonary symptoms. In addition, CARC contains VOCs, which are released during application. Military CARC systems are volatile organic hazardous air pollutant (VOHAP) free. VOC content of these systems are provided in Table 3. Proper techniques for applying CARC are required by performing painting in an enclosed paint booth equipped with filtered ventilation and other process controls. Personal protective equipment (PPE) is also required to prevent personnel exposure. Due to the use of administrative and engineering controls during paint process, air emissions are anticipated to be minimal.

Table 3: CARC Paint Military Specified VOC Content

Military Standard	Title	VOCs
MIL-DTL-53022 Type II	Corrosion Inhibiting Epoxy Primer	420 grams/liter (3.5 pounds/gallon)
MIL-DTL-53030 Type II	Water-based Epoxy Primer	340 grams/liter (2.8 pounds/gallon)
MIL-DTL-53039 Type III	Single Component, Aliphatic, Polyurethane Chemical Agent Resistant Coating	180 grams/liter (1.5 pounds/gallon)
MIL-DTL-64159 Type II	Water Dispersible Aliphatic Polyurethane Camouflage Coating	220 grams/liter (1.8 pounds/gallon)
MIL-PRF-32348 Type II	Powder Coating, Camouflage Chemical Agent Resistant Coating	0
MIL-PRF-22750 Type II	Coating, Epoxy, High-Solids	340 grams/liter (2.8 pounds/gallon)

Planned prototype fabrication facilities for both BAE and GDLS are located in CAA Attainment Areas with the exception of Sterling Heights and Plymouth, Michigan, located in Macomb and Wayne counties respectively. Their nonattainment status is classified as marginal (the least serious nonattainment classification) for 8-hour ozone. Based on the evaluation provided above, it is highly unlikely that MPF prototype manufacturing would result in nonattainment status for current attainment areas.

As part of final assembly, the MPF system would be charged with operating fluids, fire extinguishing agents and refrigerants. Of these, fire extinguishing agents and refrigerants pose the greatest risk of environmentally hazardous air emissions because they are GHGs. The MPF system is equipped with an AFES. Based on experience with similar systems, it is expected to use

heptafluoropropane (HFC-227) or a similar non-ozone-depleting alternative as an extinguishing agent. HFC-227 has a high global warming potential (GWP) of 3,220 times that of carbon dioxide. The MPF system would be expected to use up to 40 pounds (lbs.) of HFC-227 and up to 4 lbs. of dry chemical (sodium or potassium bicarbonate) total in its AFES and manual fire extinguishing systems. Care must be taken to mitigate atmospheric release of the agent when transferring or charging fire extinguishing systems. The MPF is also expected to be capable of cooling the crew compartment, requiring the use of refrigerants in an air conditioning system. Typically R134a, or tetrafluoroethane, is used in ground tactical vehicle air conditioning systems. Based on similar vehicles, the MPF is likely to require 5 lbs. or less of R134a. R134a has a GWP of 1,430. Only certified technicians will charge air conditioning systems. Although AFES and refrigerants have elevated GWPs, even a catastrophic release from multiple vehicles would constitute a negligible release when compared to the threshold of 650,000 metric tons of CO_2 equivalents.

Initial Fielding

Initial fielding of the MPF, including transportation to gaining installations and de-processing is expected to have negligible impact on air emissions. MPF vehicles will be transported via semi-truck/trailer, rail car, aircraft, and/or marine transport vessels. MPF transportation to gaining installations is expected to have negligible impacts on air quality and would be limited to emissions from the truck, train, aircraft or vessel during the one-time delivery. Air emissions expected from de-processing would be negligible and limited to emissions related to use of solvents/sealants required for any final assembly required after vehicle transport.

Testing, Training, and Operations

Air quality impacts from testing, training, and general system operation are expected to be minimal. In general, they will be similar to those for other tracked combat systems. The primary sources of emissions are anticipated to include dust generation, engine emissions, munitions ignition, and possible release of refrigerants and fire suppressants. Additionally, air emissions may be generated through construction activities required to provide infrastructure to support the required vehicle training, operations, and maintenance.

Vehicle maneuvers on improved, slightly improved, and unimproved surfaces are expected to generate airborne dust. Testing and training activities will require the MPF system to perform at extremes, using varied speeds on varied surfaces including dirt, sand, mud, rock and pavement. Dust generation will be a function of drive surface type and density, frequency of passes, velocity, payload, and course design required to satisfy the test or complete the training exercise. Dust is expected to be a short-term impact of vehicle operation, compared to that generated by other military vehicles. Testing and training will occur on a periodic basis and for a limited duration, which will limit the persistence of airborne dust. Prior to test or training activities, installation personnel would evaluate potential air quality impacts and prepare necessary mitigation plans to minimize dust generation.

The MPF is expected to generate some level of criteria pollutants and GHGs. The MPF will be fueled with high-sulfur diesel such as JP-8 (MIL-DTL- 83133E), North Atlantic Treaty Organization (NATO) F-24 (NE-14-28), and DF-2 (ASTM D 975). The MPF qualifies for a national security exemption from Environmental Protection Agency (EPA) emissions standards because it has armor and permanently attached weaponry. Consequently, concentrations of emitted pollutants are expected to exceed EPA emission standards. Diesel engine exhaust emissions will include CO, CO_2, various hydrocarbons (HCs), particulate matter and NO_x – the concentrations of

which will vary according to the sulfur content of fuels used. Emissions testing has not been completed for the engines planned for use in the MPF; however, based on the relatively low planned use (approximately 3,500 miles per vehicle annually) and the limited size of the fleet (approximately 500 units), the overall quantity of pollutants emitted during engine operation is expected to have minimal impacts on air quality and global warming. Greenhouse gas emissions are expected to be less than 15,000 metric tons of CO_2 equivalents per year. This estimate assumes fuel economy of at least 1.2 miles per gallon (expected based on the maximum size) and uses EPA's Center for Corporate Climate Leadership's published estimates of diesel fuel emission factors for CO_2, methane, and nitrogen dioxide.

Live-fire events are expected to emit a negligible quantity of pollutants. Testing, training, and operation will require firing of the main turret cannon, supporting small arms, the smoke grenade launcher and the on-board smoke generator. Air-borne emissions related to propellant ignition include CO, ammonia (NH_3), hydrogen chloride (HCl), NO_x, SO_x, and lead oxides (PbO_x). HAPs generated by smoke grenades will include CO, CO_2, lead (Pb), (NO_x), sulfur dioxide (SO_2), particulate matter (PM_t-2.5 and PM_t-10) and various HCs among trace amounts of several HAP pyrotechnic products. These pollutants are anticipated to disperse relatively quickly, although dispersion times will reflect weather conditions at the time of firing. Humidity, rain, temperature and wind will all play a role in dispersion. Long term impacts to air quality are not anticipated.

As described in the Production section, the MPF includes systems containing GHGs, including the AFES and the air conditioning systems. Testing, training, and operation may require occasional activation of the AFES. Upon activating the AFES and manual systems, HFC-227 and sodium bicarbonate will be released both within and around the vehicle, generating temporary clouds of extinguishing agents. If fire is present during activation, decomposition of HFC-227 may generate hydrofluoric acid, carbonyl difluoride, CO and CO_2. Use of the fire suppression systems will be infrequent, localized to the equipment, and will not result in degradation of air quality in the long term. Similarly, any air conditioning R-134a releases will be minor and infrequent and not expected to significantly impact air quality. During normal operations, the refrigerant will remain in the system and will not be released to the atmosphere. Should the MPF exhibit refrigerant leaks, the vehicle would be repaired according to specific protocols by certified technicians. Accidental releases are expected to be infrequent. As described in the Production section, even catastrophic release of AFES agents and refrigerants would be considered negligible when compared to the threshold of 650,000 metric tons of CO_2 equivalents.

In general, tester training, NET, and institutional training is expected to have similar emissions to those described above as resulting from general training, but these types of training will be less frequent than mission-level training. Consequently, they are anticipated to have minimal impacts on air quality.

If implemented, the proposed action would result in fielding the MPF to up to 32 IBCT garrisons – few of which currently have MPF-like tracked vehicles. As a result, some of these installations do not have sufficient infrastructure for system support, training, operation, storage, and maintenance. Some installations may need to construct maneuver areas, tank trails, or sufficient hard stand or other parking areas. These infrastructure upgrades will need to accommodate support vehicles such as the M88A2 recovery vehicle and others described in Section 4.2. Site-specific environmental impacts of construction will be evaluated in site-specific NEPA analyses. In general, *indirect* impacts to air quality would be expected including dust, particulate matter and combustion emissions from construction equipment, materials delivery and workers. Installations

would implement construction best practices such as dust control measures to mitigate impacts during construction activities. These impacts will be short in duration and are expected to be minimal.

Minimal indirect air quality impacts are also expected from operation of support vehicles. In general, operation of these vehicles is expected to have similar impacts on air quality as operation of the MPF. However, they are fewer in number than the MPF and will be operated less frequently in support of MPF testing, training, and operation.

Maintenance

Potential air quality impacts due to maintenance activities are expected to be minimal and would include VOCs emissions due to use of paints, solvents, and adhesives and accidental release of refrigerants and fire suppressants.

Testing activities will require some field maintenance, which would include the use of small amounts of cleaning solvents and adhesives that can contain VOCs and HAPs. These materials will be used on a limited basis in conjunction with site safety and environmental management plans and will not contribute to significant air pollution.

Field level maintenance includes general maintenance and upkeep tasks to be conducted at the fielding location, as described in Section 4.7. Criteria pollutants, VOCs, and VOHAPs may be emitted when performing tasks which require the use of solvents, adhesives, thread lockers and anti-seize compounds, and CARC for general cleaning, maintenance, disassembly/reassembly of components, replacement of expendable items, and paint touch up. The types and amounts of materials for MPF maintenance and repair will be similar to those used for other ground vehicle systems and include some criteria pollutants, VOCs, and VOHAPs. These materials will be used in designated areas on a limited basis in conjunction with site safety and environmental management plans with minimal contribution to air pollution.

In addition, maintenance tasks include servicing the air conditioning and AFES systems. Technical Manuals (TMs), in accordance with the CAA, would require that only certified technicians recover or recharge air conditioning systems. AFES bottles are replaced rather than recharged, minimizing the potential for releases. Accidental releases are expected to be infrequent and the impact to air quality will be negligible.

Sustainment level maintenance would be expected to generate minimal air quality impacts. This level of maintenance includes major overhaul and remanufacturing and is performed at qualified contractor and Government industrial depots. Each facility is responsible for its own site safety, permitting, and environmental plans.

Anticipated tasks and resulting air emissions for this type of maintenance is similar to that described for production. However, during sustainment maintenance, overhauls will include corrosion and CARC removal not required during initial production. CARC and corrosion removal are generally completed using blast media in self-contained blast chambers designed with filtration systems to remove and contain hazardous dusts. Although the majority of MPF surfaces will be coated with CARC meeting current military standards requiring hexavalent chromium-free formulations, some components may still be coated with older CARC processes which may contain hexavalent chromium. Consequently, the dust generated during CARC removal is expected to contain small quantities of hexavalent chromium. Personnel that may be exposed to CARC dusts will follow site-specific safety protocols, including use of appropriate PPE. Due to

industrial process controls, the expected air quality impacts from this process are anticipated to be minimal.

The indirect effects of support vehicle maintenance emissions are expected to be similar to those for the MPF and are also minimal.

Demilitarization and Disposal

D&D of the MPF is expected to generate minimal air emissions. Prior to disassembly of the vehicle hull, the CARC coating would have to be removed using procedures like those used for sustainment level overhauls. CARC removal must be completed in a controlled manner prior to any torch cutting; when CARC exceeds 170°C the coating may release hazardous cyanates into the air. Once CARC has been removed, the hulls will be cut into pieces using torches or a similar tool. This process generates hazardous fumes through heating of the hull's metal substrate. Best work practices, including use of appropriate PPE, proper ventilation, and automation of the cutting process, limit personnel exposure to hazardous fumes. In addition, D&D will be completed at facilities permitted for these activities which operate in accordance with the CAA, site-specific permits, and environmental management plans. Based on these activities and overall size of the fleet, air emissions are expected to be minimal from D&D procedures.

Figure 1 projects air pollutants likely to be emitted through the production, testing, training, initial fielding, operation, and maintenance of the MPF as discussed in Section 6.1, Air Quality.

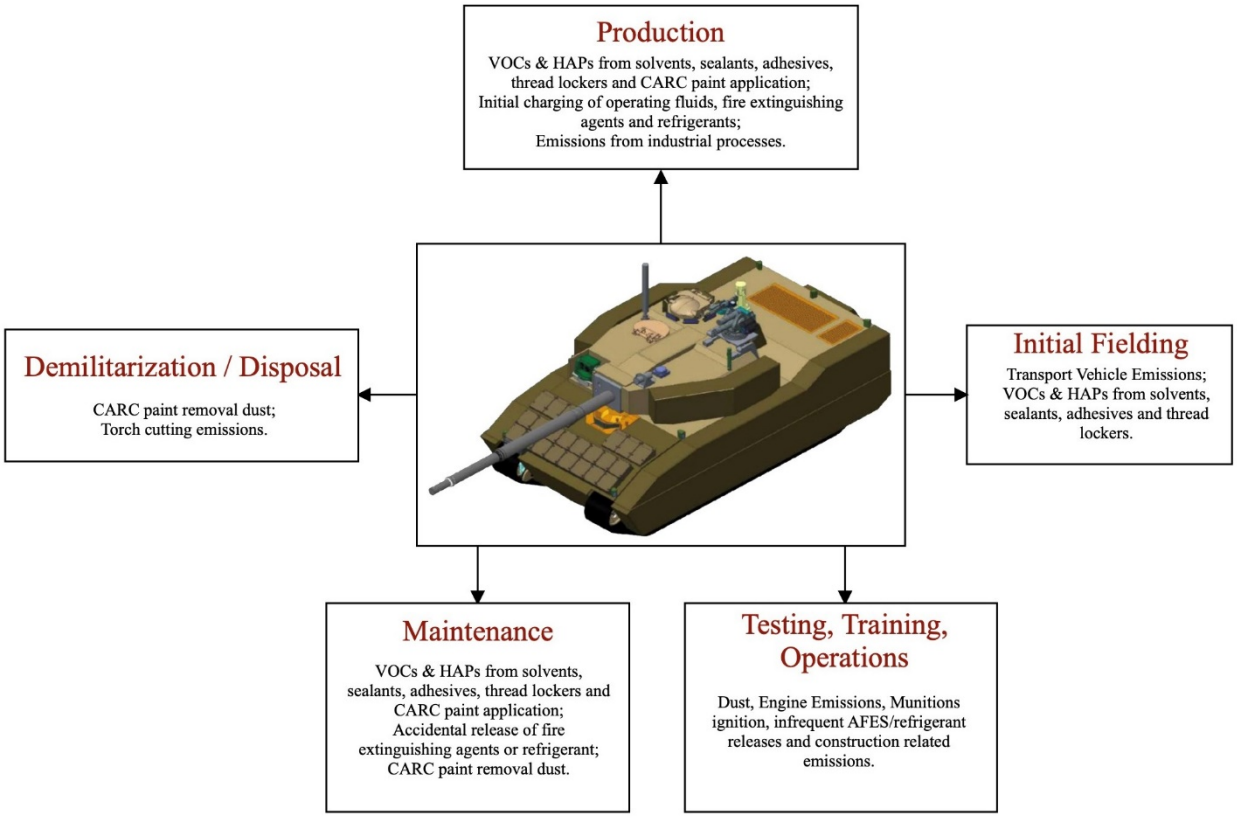


Figure 1: Possible MPF Air Emissions

6.1.2.2 No-Action Alternative

Implementing the No-Action Alternative would result in minimal impacts to air quality. Production facilities would likely continue to produce other similar goods. Testing, training, operation and maintenance would be conducted with other military assets and would be expected to have similar air quality impacts. Without addition of the MPF to the IBCT, construction of support infrastructure would not be anticipated; avoiding the air emissions expected with the MPF and support vehicles. MPF D&D would not occur, but D&D of other similar systems would still occur, with similar air emissions. As a result, the air quality impacts expected from the No-Action Alternative are similar, but slightly less, than those expected for the Preferred Alternative.

6.2 Water Quality

Water quality describes the chemical and physical composition of water and reflects both natural conditions and human activities. This includes the presence and concentration of pollutants present in surface water, groundwater, and storm water.

6.2.1 Existing Conditions

The affected environment is the numerous watersheds and wetlands near production, testing, training, initial fielding, operation, maintenance and D&D locations. More specifically, it includes storm water runoff from these locations, groundwater aquifers located beneath and down gradient from these locations, and surface water which may be directly affected by spills or receive site runoff or site groundwater discharge. Government and commercial industrial facilities supporting MPF lifecycle activities are required to comply with federal, state and local environmental statutes and regulations. This includes holding and maintaining appropriate water discharge permits and plans such as industrial wastewater discharge permits, surface water discharge permits, and Spill Prevention, Control, and Countermeasure Plans (SPCCPs).

6.2.2 Environmental Consequences

This section provides a discussion of the possible environmental impacts to water quality that could result from the Proposed Action and No-Action alternatives. Significant water quality impacts would include surface water pollutant concentrations exceeding the Total Maximum Daily Loads designated by the Clean Water Act or a persistent increase in turbidity. Significant groundwater impacts would include contaminant discharges leading to groundwater concentrations exceeding Safe Drinking Water Act Maximum Contaminant Levels. Other significant water quality impacts would include a violation of an existing permit, or loss/destruction of more than one acre of jurisdictional wetlands without appropriate mitigation.

6.2.2.1 Proposed Action

The proposed action is described in detail in Section 4. Evaluation of the effects of the proposed action on water quality are discussed below and organized by program phases. Phases with similar impacts are grouped to avoid repetition.

Production

Impacts from production are characteristic of industrial vehicle manufacture in compliance with local, state, and federal wastewater discharge requirements. Possible sources for water impacts would include wastewater from surface treatments, plating processes, painting and other processes,

and spills or leaks during production. Discharges from these sources would be mitigated by use of engineering and process controls. As a result, water quality impacts during production are expected to be negligible.

MPF system manufacturing would be performed inside industrial buildings equipped with concrete or mortar floors which prevent waste dusts, soldering, brazing and welding flux, oils, greases and system fluids from entering site groundwater. Fluids would be stored with appropriate secondary containment to prevent spills and leaks. Drain systems installed in shop floors are designed to collect fluids and route them to industrial treatment facilities or sanitary sewer discharge points without contaminating ground or surface water. Once collected, facility wastewater streams typically undergo industrial pretreatment to meet permit requirements prior to discharge to Publicly Owned Treatment Works. In some cases, facilities may operate industrial wastewater treatment plants and discharge treated water directly to surface water. In this instance, facilities would be subject to the requirements of their National Pollutant Discharge Elimination System permit for the discharge. The MPF vendors are contractually required to follow environmental regulations and statutes, including local, state, and federal permitted requirements. As described above, industrial discharges resulting from MPF production are expected to have a negligible impact on water quality.

Initial Fielding

Water quality impacts during initial fielding are expected to be negligible. Impacts could result from spills/leaks from the vehicle used to transport the MPF to the receiving installation. Annually, approximately 50 MPFs will be transported to receiving installations. With this small number of trips, it is not likely that a significant spill during transport would impact surface or groundwater. Impacts could also result from small spills of adhesives or solvents during de-processing. However, only small volumes will be used during these activities and installation cleanup protocols would be followed in the case of a spill.

Testing, Training, Operations

Potential impacts to water quality during MPF testing, training, and operations would be expected to be minimal and largely be a result of fording during training and operations, leaks or spills of vehicle fluids, and vehicle cleaning. Some indirect impacts may also result from infrastructure upgrades.

Although most of these activities will be performed on pre-existing designated areas absent of surface water, some testing, training and operational exercises will include fording. Testing locations generally have concrete fording pits to mitigate impacts. However, fording at unimproved crossings during training and operations will increase surface water turbidity through agitation and shearing of sediment and suspension of soils clinging to the MPF prior to entering the water. Additionally, fording operations may result in the dissolution of chemical constituents from residual surface petroleum, oil, and lubricants (POLs) on submerged components. Individual installations will develop site-specific assessments and mitigation plans in accordance with the Integrated Training Area Management (ITAM) program and Range and Training Land Program. Mitigations would be anticipated to include range and maneuver area design to avoid water features and rely on designated fording locations when necessary. Designated fording areas will be constructed with improved surface pathways (e.g., heavy coarse aggregate or concrete) to minimize sediment disturbance. If necessary, additional submerged net barriers and oil buoys may

be deployed to localize the water quality disturbance. Fording activities are anticipated to result in minimal water quality impacts.

While operating the system, it is possible vehicle fluid spills may occur. However, the design is expected to use standard automotive fittings designed to prevent leaks, and the vehicle features an enclosed hull which would capture minor leaks during vehicle operation. In the unlikely event a catastrophic failure occurs, vehicle fluids could be released into surface water or ground water. Parked vehicles may leak small amounts of fluids which could be dissolved in runoff. However, testing, training, and operations will take place at existing facilities with SPCCPs with pre-planned protocols to prevent spills and contain them when they do occur. Drain pans will be used beneath parked vehicles and perimeter berms employed in parking areas to prevent small but recurring leaks from contacting runoff. Spills and leaks are anticipated to result in minimal water quality impacts.

External cleaning of the MPF system and support vehicles would typically be performed on wash racks designed for vehicle cleaning and capture of resulting fluids. Wash racks provide recycled, filtered, non-hazardous wash and rinse solutions to remove soil and some oils and greases from the vehicle. Wash racks collect used wash and rinse water and pretreat it prior to discharge in accordance with facility permits. Use of the wash rack prevents untreated wash effluents from entering storm sewers or local surface and groundwater. Use of wash racks will likely have negligible impacts on water quality.

As previously discussed, some fielding locations may not have sufficient infrastructure for system training, operation and storage. Additional maneuver areas, tank trails, hard stand/parking areas, hardened bridges, hardened stream crossings, and/or maintenance facilities may need to be constructed at these installations. This construction will be unique to each site and will be evaluated in site-specific NEPA documents. In general, construction activities may temporarily impact water quality of local surface waters and wetlands through site runoff, which may contain increased loads of suspended solids and water-soluble constituents from construction materials such as hot-mix asphalt. Adherence to storm water pollution prevention plans and best management practices including silt fences, berms, and inlet filters placed on storm sewer drains will minimize impacts to surface water. Water quality impacts due to construction are anticipated to be minimal.

Maintenance

Potential impacts to water quality during maintenance activities are related to spilled vehicle fluids and wastewater management from chemical processes used during sustainment level maintenance and would be expected to be minimal. Maintenance will occur at facilities which are required to comply with all applicable environmental laws and regulations.

Occasional maintenance and repairs on the MPF will be required during testing, training, and operation. These activities will include the removal, addition, collection and disposal of vehicle fluids. Likewise, maintenance and repairs will be required for supporting vehicles. Spills or leaks during these activities could contaminate local surface and groundwater resources. Maintainers are required to follow proper disposal methods for vehicle fluids. Maintenance activities will be conducted within special purpose maintenance bays equipped with concrete floors and floor drains with oil/water separators. To further mitigate this risk, MPF TMs will specify preventive maintenance procedures to avoid spills/leaks and will include use of drain pans for tasks requiring fluid removal. In the event of a contaminating spill or leak, personnel will follow protocols mandated in SPCCPs and Installation Spill Containment Plans (ISCPs) to prevent the migration of

vehicle fluids into sanitary sewer lines or water resources. Environmental impacts to water resources related to leaks and spills are expected to be minimal based on the limited annual operations of the vehicle and number of vehicles at each IBCT.

Periodically, MPF systems will be shipped to Government depots or qualified contractor facilities for sustainment level maintenance. These facilities have similar engineering controls and wastewater systems as discussed for production and are subject to industrial wastewater discharge permitting and regulations. Like field maintenance, sustainment activities will follow procedures specified in TMs, to include compliance with local environmental laws, regulations, and policies. Active SPCCPs (and ISCPs for Government facilities) will be in effect and work areas will be equipped with spill containment kits. Similar to Production, water quality impacts as a result of sustainment level maintenance are expected to be minimal.

Outdoor storage of vehicles and/or parts awaiting maintenance may occur which could result in pollutants entering surface water through runoff containing vehicle fluids leaks/drips, greases, or residual paint waste dust. Depot facilities are responsible for their compliance with ISCPs and SPCCPs. Spill pans will also be used to prevent collected leaking fluids from migrating with stormwater runoff.

Demilitarization and Disposal

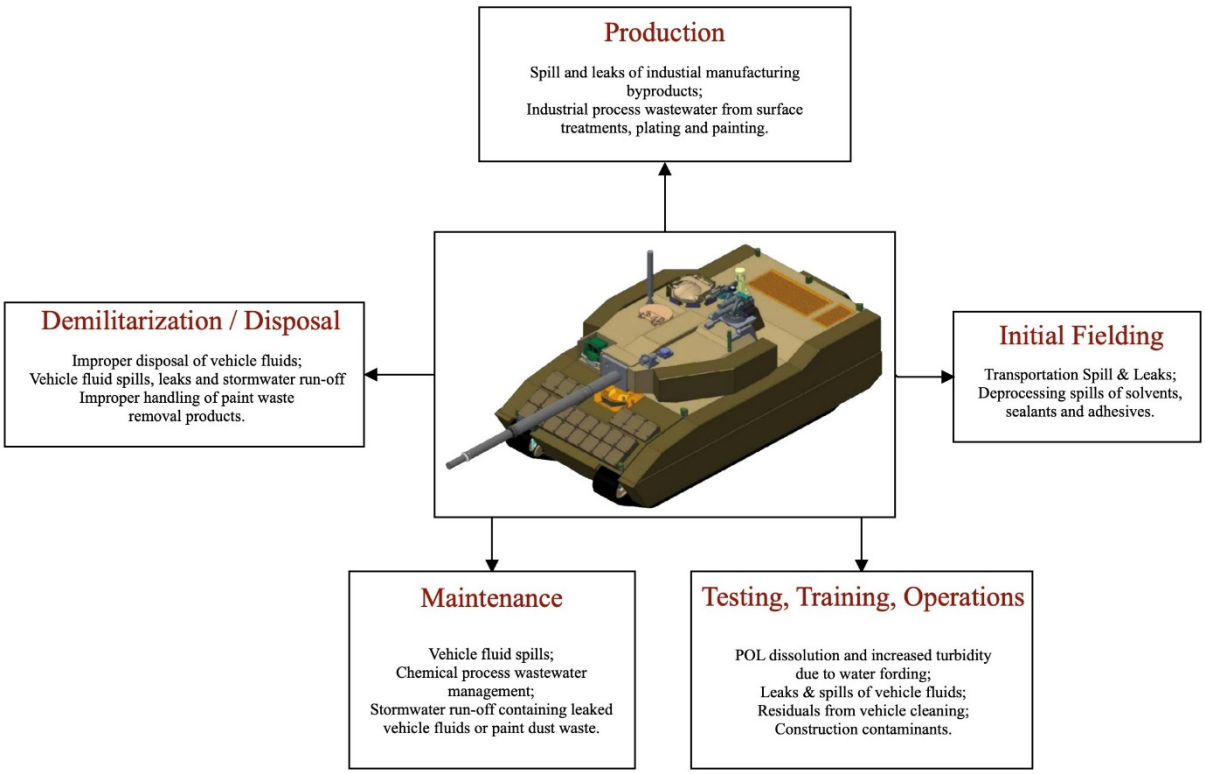
Potential impacts to water quality during D&D operations are minimal and could result from improper disposal of vehicle fluids, vehicle fluid spills, outdoor storage of vehicle components that may contain grease or leaking fluids, and improper handling/storage of paint waste following paint removal. Similar to scheduled maintenance, D&D activities will be conducted within existing facilities designed for D&D operations. DLA Disposition Services manages D&D in accordance with their standard operating procedures and completes disposal according to environmental regulations.

During D&D operations, vehicle fluids will be removed and properly stored until an appropriate disposal method is identified in accordance with environmental laws and regulations. Recycling is the preferred method of disposal for vehicle fluids. If the D&D facility determines the need for disposal of fluids rather than recycling, the wastes will be handled in accordance with applicable environmental regulations.

Outdoor storage of vehicles and/or parts awaiting disposal may occur which could result in pollutants entering nearby water resources from runoff containing small leaks/drips of vehicle fluids, greases, or residual paint waste dust if vehicle is stored outdoors after paint removal.

To mitigate these potential outcomes, D&D facilities will follow program-specific D&D plans and DLA Disposition Services procedures. D&D activities will be conducted at Government facilities and/or approved commercial industrial complexes properly equipped to perform D&D IAW international treaties and agreements, federal and state regulations, and AR 700-144 (Demilitarization and trade Security Controls). In particular, disposal will be completed in a manner that complies with environmental regulations.

Figure 2 illustrates possible water quality impacts that should be addressed and mitigated for the production, testing, training, initial fielding, operation and maintenance of the MPF.



**POL: Petroleum, Oil & Lubricants*

Figure 2: Possible Water Quality Impacts

6.2.2.2 No Action Alternative

Implementing the No-Action Alternative would result in minimal impacts to water quality. Production facilities would likely continue to produce other similar goods. Testing, training, operation and maintenance would be conducted with other military assets and, although fording operations may be less frequent, would generally be expected to have similar water quality impacts. Without addition of the MPF to the IBCT, construction of support infrastructure would not be anticipated, avoiding the water quality impacts expected with the MPF. MPF D&D would not occur, but D&D of other similar systems would still occur. As a result, the water quality impacts expected from the No-Action Alternative are similar, but slightly less, than those expected for the Preferred Alternative.

6.3 Land Use and Soil Resources

Land use refers to the various ways in which land might be used or developed, the kinds of activities allowed, and the type and size of structures permitted. General land use characterizes the types of uses within a particular area and can include agricultural, residential, commercial, industrial, scenic, natural, military, and recreational. Soil resources refer to the chemical and physical structure of soil, both of which are critical to maintaining its health and ability to sustain vegetation and serve as habitat.

6.3.1 Existing Conditions

The affected environment is the land and soils underlying areas where production, testing, training, initial fielding, operation, maintenance and D&D occur. Production facilities are expected to be located in existing industrial areas. Army installations use land for family housing, troop housing, training, retail, parks and recreation, schools, transportation and industrial operations. When compatible with the Army mission and long-term ecosystem management goals, some Army lands are leased out for agricultural purposes.

Existing soil resources at affected locations include various soil types based on geographic settings. Soils range from sandy to clay, with some locations including highly erodible soils.

6.3.2 Environmental Consequences

This section discusses the possible environmental impacts to land and soil resources that could result from the Proposed Action and No-Action alternatives. Significant land use impacts generally would occur when more than 5,000 acres is removed from public use. This is a matter of context and intensity, however, and sizes deemed 'significant' may vary depending on the size of the installation.

Impacts to soil include alteration of the physical, chemical and biological characteristics of soil. Impacts to soil could result from land use, its development, or its designated purpose. Significant soil impacts would occur if soil loss, compaction, or pollution precluded natural reestablishment of native vegetation within two growing seasons on a land area greater than a total of 1,000 acres; if substantial erosion occurred causing stream degradation or deposition of mud; or if more than five percent of unimproved land under administrative control of the installation was converted to improved infrastructure.

6.3.2.1 Proposed Action

The proposed action is described in detail in Section 4. Evaluation of the effects of the proposed action on land use and soil resources are discussed below and organized by program phases. Phases with similar impacts are grouped to avoid repetition.

Production

Although the exact production location is not yet known, existing industrial manufacturing facilities are expected to be used, with possible upgrades. Manufacturers are subject to federal, state, and local environmental regulations and overall land use and soil impacts are expected to be minimal.

The acquisition and production of the MPF is expected to be carried out at existing manufacturing facilities which may require upgrades and modifications. In the event that new construction is required to support production, it would be expected to be sited in an industrial area and not on pristine land. In addition, local regulations and permitting procedures would provide controls for potential impacts during production facility construction. Soil impacts including erosion, compaction, or chemical/biological changes due to construction of MPF production facilities are expected to be minimal.

Once manufacturing facilities have been established, the impact of production activities on soils are anticipated to be negligible. The contract requires the manufacturer to adhere to environmental

laws and regulations. As a result, any potential spills/leaks during production are not expected to migrate to soils, and raw materials and fluids are expected to be stored appropriately.

Initial Fielding

Initial fielding activities, including vehicle transportation and de-processing, are expected to have negligible impacts on soil resources. MPF transportation would use established roads, rail, air, or maritime infrastructure. During de-processing following MPF arrival at the gaining installation, leaks/spills would be addressed immediately and in accordance with local environmental regulations.

Testing, Training, Operation

Land use and soil impacts due to testing, training, and operations are expected to be minimal. Potential impacts would result from vehicle operation, live fire testing and training, and vehicle fluid spills/leaks. Indirect land use and soil impacts may result from infrastructure improvements, including maneuver area upgrades, tank trail improvements, hardening of roads and bridges, hardening of stream crossings, or addition of hard stand/parking areas, depending on site-specific needs.

MPF testing will cumulatively include approximately 22,500 vehicle-miles split among six or more locations, resulting in some soil erosion and compaction. Nearly all testing will be conducted at existing test and maneuver areas already used for testing tactical combat vehicles heavier than the MPF. Since test areas are already in use, erosion control plans will be in effect for these areas and will mitigate rutting and disruption. At these locations, soil compaction is not expected because the test trails are designed for heavier vehicles.

The majority of test and training events will be conducted at existing ranges where tracked combat systems are regularly operated. However, the SVA and LUT will occur at Ft. Bragg, North Carolina, which currently does not host tracked vehicles. The IOT&E event and some mission-level training and general vehicle operation may occur on existing military facilities that host other military vehicles, but do not routinely host tracked vehicles. As a result, some locations may require range upgrades to support the tracked vehicles. At locations with highly erodible soils, mitigation measures such as hardened stream crossings may be required to minimize erosion. Site-specific NEPA documentation will evaluate needs of individual installations.

All proposed MPF fielding locations have existing ITAM programs that manage, repair, and mitigate the land disturbance that results from maneuver training. ITAM activities include, but are not limited to, repairing and revegetating maneuver damage, ground hardening, erosion control measures, and establishing temporarily off-limits areas to allow ground re-stabilization. ITAM efforts ensure maneuver training ground disturbance impacts will be minimal and temporary.

Due to the vehicle's weight, soil compaction and its effect on other soil properties such as porosity and hydraulic conductivity are likely to occur on tank trails and heavily traveled off-road areas. In general, tracked vehicles create wider shallower ruts than wheeled vehicles of the same weight. However, for tracked systems, the idler wheel configuration and attached belts create varied tensions that result in non-uniform pressure distribution that can impact soil. Further, vibrations from the engine and other machine parts are more readily transmitted into the soil due to reduced suspension effects as compared to wheeled systems. Consequently, the vehicle weight is a greater factor in determining the depth of physical alteration of the soil than the ground pressure. Deep rutting collapses the soil, eliminating the air voids between soil

particles. Without air voids, the collapsed soil will no longer support nitrogen-fixing bacteria required for fertile soils, and the physical structure prevents plant roots, worms and water from penetrating it. This process increases surface runoff and erosion.

Soil compaction depends on soil type, soil moisture content, and the forces applied to the soil. Since the MPF is being fielded to numerous sites with different soil types, a programmatic evaluation of soil compaction is not practical; rather, compaction should be addressed in site-specific documents. APPENDIX B provides further discussion of compaction and an illustrative example of the effects of a 35-ton tracked vehicle on one particular soil type. In general, drier soils can sustain higher axle loads and higher contact pressures with less adverse effects. Consequently, soil compaction and deep rutting may be mitigated by limiting peace time training exercises to times when unpaved soil resources are at or near the optimum moisture content. This is particularly important because compaction remediation treatments do not provide complete soil recovery, especially after deep rutting has occurred. Whether this mitigation is required at a given installation is dependent on that installation's soil types and use of other erosion control measures.

Vehicle fluid leaks during operation or due to accidents or catastrophic failure may result in soil contamination but would be expected to be minimal. The MPF uses standard automotive and/or military components designed to minimize leaks. It also has a sealed hull designed to contain fluid leaks. The hull will be drained properly during maintenance activities to prevent discharges to soil. The discharge would then be properly disposed of. Frequent PMCS will be performed on the MPF to minimize the likelihood of a major leak or catastrophic failure. Testing, training, and operations will take place at facilities that have ISCPs and SPCCPs and are equipped to immediately respond to leaks resulting in soil contamination.

Live-fire training would potentially lead to minimal chemical contamination of soils within the impact zone at existing ranges due to the chemical make-up of projectiles and propellant. Potential projectile ignition byproducts include carbon monoxide, ammonia, hydrogen chloride and oxides of nitrogen, sulfur and lead, as well as dust from unburned propellant. Lead contamination is prevalent at firing ranges and must be managed appropriately to minimize environmental impacts. Minor soil erosion would also be expected at firing ranges, particularly along soil back-stops and berms. Range maintenance, including the removal and disposal of projectiles captured in berms and erosion control measures, is essential to prevention of long-term soil impacts from range use. Site-specific best management practices and plans will regulate frequency of use, approved projectiles, and required maintenance and prevent damage to neighboring lands.

As mentioned in the Air and Water Quality sections, the proposed action may result in upgrades to maneuver areas and tank trails, hardening of low water crossings and bridges, and construction of storage areas and maintenance facilities at some locations. These would be long-term changes to land use but would likely not be used exclusively for the MPF. Because each installation will have unique construction requirements and has a different environmental setting, it is not effective to programmatically evaluate the soil and land use impacts of that construction. Each site should assess the environmental impacts of its planned upgrades in a site-specific NEPA document.

Maintenance

Potential direct impacts to soil resources during maintenance activities are related to spilled or leaked vehicle fluids onto the ground and are expected to be minimal.

Field level maintenance and repairs will occur during testing, training, and operation. These activities will include the replacement of vehicle POLs to include hydraulic fluids, engine coolant, fuel, and oils. In addition, adhesives, sealers, thread locking compounds, and solvents will be used during maintenance activities. Repair and maintenance activities will be performed according to TM protocols written to mitigate spillage and release of hazardous materials into surrounding soils. In addition, these repairs and maintenance activities will be performed in motor pools and designated maintenance areas that are equipped with paved or hardened surfaces. Where applicable, containment berms and collection basins will be used to prevent leaks and spills from migrating into surrounding soils.

Sustainment level maintenance will be performed at existing depots or industrial facilities that are equipped with infrastructure which includes containment, floor drains, and industrial wastewater systems to prevent releases to site soils. Depots have existing ISCPs and SPCCPs and are responsible for compliance with applicable regulations. Government-owned depots are also responsible for having completed NEPA analyses for activities completed there.

Outdoor storage of vehicles and/or parts awaiting maintenance may occur which could result in pollutants entering the soil from runoff containing vehicle fluids leaks/drips, greases, or residual paint waste dust if vehicle is stored outdoors after paint removal. However, depot facilities have existing ISCPs and SPCCPs, and are responsible for compliance with applicable regulations. Spill pans will be used to prevent fluids from contaminating the soil beneath vehicles.

Demilitarization and Disposal

D&D will be performed at existing industrial sites or civilian operated contracted facilities and will not result in land use changes. Instead, D&D will be performed within the confines of existing infrastructure subject to existing environmental management, regulations and permitting specific to those functions required for D&D.

Potential impacts to soil resources during D&D operations could result from improper disposal of vehicle fluids, vehicle fluid spills, and outdoor storage of vehicle components that may contain grease or leaking fluids. Vehicle fluids will be collected in designated areas equipped with appropriate containment and spill control measures. These fluids will be contained and disposed of or recycled IAW federal, state and local regulations. As a result, the potential soil impacts are expected to be minimal.

MPF vehicles are expected to be stored outdoors prior to D&D. Drip pans should be used for all staged vehicles awaiting D&D to prevent discharge to site soils. Any fluids collected in drip pans will be recycled or disposed of IAW federal, state and local regulations. If spills or leaks occur, existing response plans and procedures will ensure proper clean up.

Figure 3 identifies land use and soil impacts that may be realized as a result of production, testing, training, initial fielding, operation, and maintenance of the MPF.

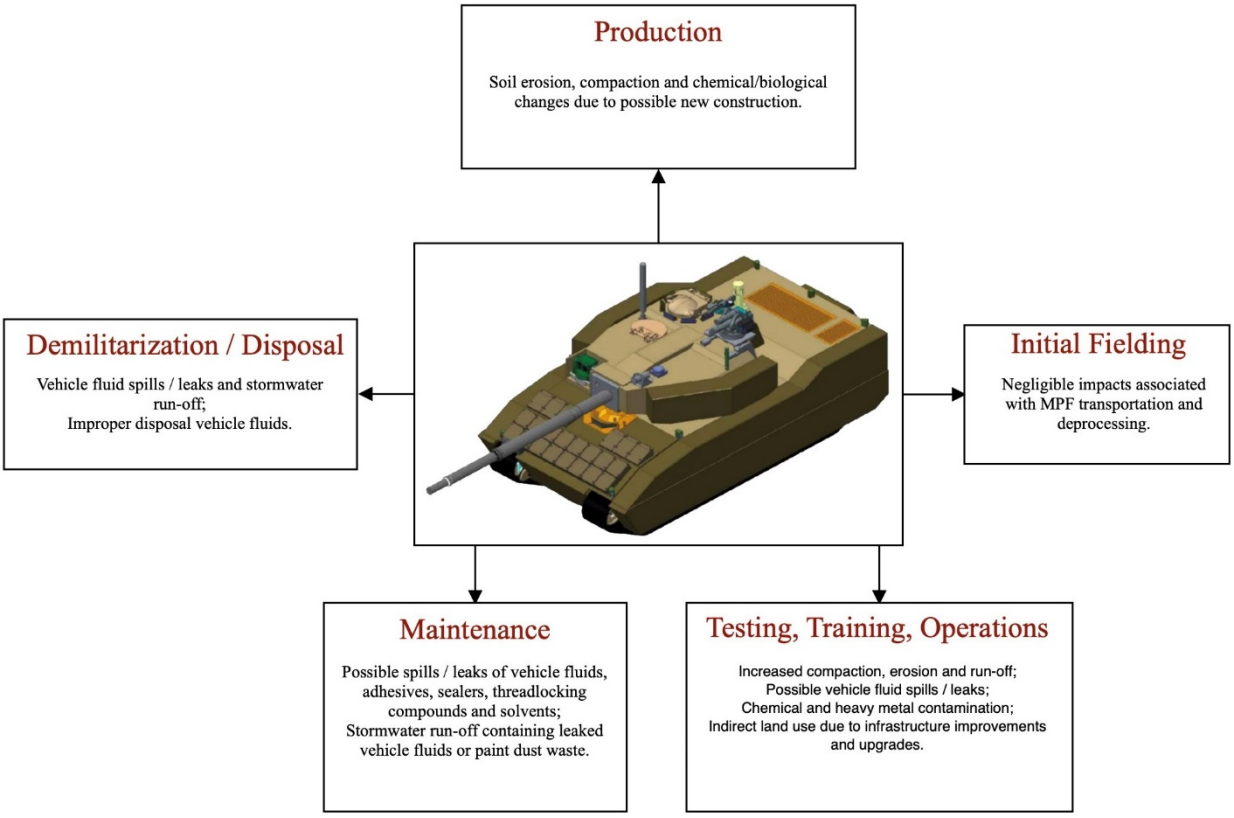


Figure 3: Possible Impacts Associated with Land-use and Soil

6.3.2.2 No-Action Alternative

Implementing the No-Action Alternative would result in minimal impacts to land use and soil resources. Production facilities still would operate within their existing footprints and would likely continue to produce other similar goods. Similar vehicles would continue to be tested on existing test tracks. Training would be conducted with other vehicles, and although it would not be due to the MPF system, soil compaction and erosion would still occur. Fluid leaks from other vehicles would be expected and live-fire training would still be carried out. Vehicle maintenance would be completed for similar vehicles, and D&D facilities would continue to dismantle other military vehicles. The greatest contrast between the Preferred Alternative and the No-Action Alternative is that construction would not be required to provide the infrastructure to support the MPF and its supporting vehicles. As a result, land use would remain as in its current state and land use and soil resource impacts expected from the No-Action Alternative would be less than those expected for the Preferred Alternative.

6.4 Socioeconomics

Socioeconomics refers broadly to the "use of economics in the study of society." For the purposes of this analysis, socioeconomics would specifically focus on the social impacts and related economic changes directly affected by production, testing, training, initial fielding, operation, maintenance and D&D. Socioeconomics may also consider how all affected environments relate

to Environmental Justice (EO 12898, 1994 and EO 12948, 1995) – evaluating consequences to specific ethnic/financial groups, race, and peoples of a specific geographical location. Socioeconomic metrics may include financial opportunity, life expectancy, literacy, levels of employment, education, wealth and overall quality of life.

6.4.1 Existing Conditions

The affected environment is the local and regional socioeconomics in areas where production, testing, training, initial fielding, operation, maintenance and D&D will occur. These activities will occur at various cities and towns across the U.S and socioeconomic conditions will be different in each location.

6.4.2 Environmental Consequences

This section provides a discussion of the possible socioeconomic impacts from the Proposed Action and No-Action alternatives. Significant impacts would include a long-term change in sales, income, employment, or population for the impacted area.

6.4.2.1 Proposed Action

No negative social or economic impacts are expected to result from the proposed action described in detail in Section 4.

Acquisition and production of the MPF should provide modest benefit to the production contractor, its suppliers, and the local tax base. In addition, the government will require the selected production contractor to use small and disadvantaged businesses for some of their subcontracted work.

While testing, training, and maintenance will be performed at various existing locations, changes to socioeconomic metrics are not anticipated as levels of activity will be nominal when compared to the overall activity of each respective site. Manpower to conduct testing and training will be provided by existing government employees, contractors, and/or military personnel stationed at the sites. Therefore, no significant hiring initiatives will be required to support testing and training.

Facilities improvement will require skilled trades, but the overall magnitude of required improvements is relatively small. Construction may represent a small benefit to commerce but will be a transient activity. Any socioeconomic benefits will be transient as well.

All D&D functions will be performed at existing sites and while depots or contractors may benefit temporarily from D&D revenue streams, there should be no negative consequence to specific ethnic groups, race or overall quality of life.

There are no EO 12898 “Environmental Justice” concerns associated at the programmatic analysis level of the MPF since it is not anticipated that the proposed action will result in any disproportionate high and adverse human health and environmental effects on children, minority and/or low-income populations. Although, no significant impacts are anticipated, installations which receive the MPF, will determine if additional site specific NEPA documentation is required to address potential socioeconomic impacts.

6.4.2.2 No-Action Alternative

Implementing the No-Action Alternative would have no impact on socioeconomics. Production facility economic activities would continue and no changes would be implemented at installations

where testing, training, operation and maintenance occur. D&D of other similar systems would still occur at D&D facilities. As a result, no socioeconomic impacts would be expected from the No-Action Alternative.

6.5 Hazardous Materials and Wastes

Hazardous materials refer to any physical, chemical or biological agent that may cause or present harm to humans, animals or the environment by itself or through interaction with other common agents. As defined in the Resource Conservation and Recovery Act (RCRA), hazardous wastes are wastes made up of hazardous materials that either exhibit specific hazardous characteristics (ignitability, reactivity, corrosivity and/or toxicity) or are included on one of three lists of hazardous wastes. These substances pose a threat to public health and the environment and their treatment, storage and disposal are regulated by RCRA. Hazardous wastes cannot be disposed of by common means and often require treatment or a phase change to render the substance inert. In some cases, special containment may be required for disposal.

6.5.1 Existing Conditions

The affected environments are the facilities where MPF production, testing, training, initial fielding, operation, maintenance and D&D will occur and their hazardous waste disposal facilities. Hazardous and toxic materials used in production facilities and on Army installations are typical of those used in industrial facilities. Typical hazardous materials used on Army installations include cleaning and disinfecting supplies, POLs and other vehicle fluids, degreasers and other industrial compounds, paints, batteries, pesticides, and explosive and pyrotechnic devices. Handling, use, and storage and disposal of these hazardous materials are subject to federal and state regulations, in addition to Army and DoD regulations.

6.5.2 Environmental Consequences

This section provides a discussion of the possible environmental impacts from hazardous materials and wastes generated as a result of implementation of the Proposed Action and No-Action alternatives. Significant impacts would occur when substantial additional risk to human health or safety would be attributable to Army actions.

6.5.2.1 Proposed Action

The proposed action is described in detail in Section 4. Evaluation of the effects of hazardous materials and wastes from the proposed action are discussed below and organized by program phases. Phases with similar impacts are grouped to avoid repetition.

Production & Maintenance

Hazardous materials required for MPF vehicle production and maintenance of the MPF will include items such as paints, adhesives, solvents, solder, sealants, batteries, refrigerants, fire suppressants, coolants, various POLs, and metal plating materials.

The amount and type of hazardous materials used for MPF are consistent with the current type and volume of hazardous materials used on other ground vehicle systems. Use of these hazardous materials would also result in the generation of hazardous wastes. However, the environmental impact of hazardous materials and resulting hazardous wastes is anticipated to be minimal.

The MPF prototyping and Low Rate Initial Production contract requires vendors to eliminate or minimize the use of hazardous materials required for production, operation, and sustainment of the MPF. The production contract will include similar requirements. All remaining hazardous materials will be identified and tracked. A list of anticipated hazardous materials associated with the MPF is included in APPENDIX C. A brief description of anticipated hazardous materials and potential impacts is included below.

Application and removal of CARC will be required during production and maintenance activities. When unit personnel use CARC for touch ups and spot painting, only small quantities are authorized. Full re-painting of the MPF would be performed during sustainment maintenance in a permitted paint booth. Substrate cleaning is required prior to painting, which may include use of solvents or water-based detergents that may contain VOCs. During cleaning and coatings application, process controls and operational protocols limit fugitive emissions, promoting the controlled collection, containment, treatment, and proper disposal of hazardous materials. With limited exceptions, pretreatments used for MPF are required to be chromate-free. Painting operations generate spent thinners, stripping solvents, waste paint, fiberglass paint filters, and used paint thinner. Waste streams resulting from coatings application will be treated as hazardous wastes in accordance with federal, state, and local laws and regulations.

Cured primers and topcoats are benign to the environment; however, stripping processes such as grinding, sanding, scraping, media blasting or solvent stripping generate hazardous wastes. When removing primer and topcoats, maintenance personnel will collect, handle, store, and dispose of the stripped coatings IAW applicable plans, procedures, and regulations.

The MPF design minimizes the use of hexavalent chromium, cadmium, and lead. However, small amounts of these materials may be used for the following:

- Cadmium and hexavalent chromium for plating military-style electrical connectors, some fasteners, and a limited number of other components
- Hexavalent chromium used as a conversion coating/post-treatment on some fasteners and aluminum parts
- Hexavalent chromium used in CARC processes on limited portions of the design
- Adhesives and sealants
- Lead in solder, bearings, and glass

During operation, these materials pose a negligible risk to personnel and the environment. The primary risks associated with using these materials are associated with application and/or removal and disposal of the materials during production and maintenance. Maintenance processes such as grinding, sanding, and media blasting could release toxic metals as respirable particles. These activities will be performed in controlled areas with proper ventilation, procedures and PPE to prevent personnel exposure. These controlled areas will also be equipped with air pollution control devices to prevent release of hazardous particulates to the environment. Wastes generated from processes with heavy or toxic metals will be collected, handled, stored, and disposed of IAW applicable federal, state, and local laws and regulations. When possible, plated metal components will be recycled as scrap metal.

Various other hazardous materials will be associated with production and maintenance which are typical of commercial automotive manufacturing. These may include acid baths used for substrate pretreatment and for the application of inorganic coatings. Aqueous and solvent cleaners and a

myriad of adhesives, sealants and anti-seize compounds will be used. Use of these hazardous materials will result in hazardous wastes to be disposed of IAW with applicable regulations.

The vehicle fluids required for use in the MPF are listed in Table 2. These fluids will require draining, filling, and disposal at regular intervals. Table 4 presents preliminary estimates of fluid change intervals based on similar vehicles. Maintenance activities will be conducted in a maintenance bay or garage where facilities exist for proper handling and storage of POLs. Maintainers are responsible for disposal of POLs in accordance with federal, state, and local laws. Typically, POLs contaminated by heavy metals are considered hazardous waste while uncontaminated POLs are non-hazardous wastes recycled or disposed of as a non-regulated waste through the installation of hazardous waste management facility. Military installations also have SPCCPs, ISCPs, and other Standard Operating Procedures (SOPs) that address POL handling, storage, disposal, and clean-up in case of an accidental spill. These activities will also be periodically taught during training activities.

Table 4: Preliminary Fluid Change Intervals for MPF

Vehicle Fluid	Change Interval
Engine Oil	4 months
Transmission Oil	12 months
Hydraulic Fluid	6 months
Final Drive Oil	4 months
Coolant	As needed

Refrigerants such as R-134a (1,1,1,2-Tetrafluoroethane) are expected to be used in the MPF air conditioning system. The AFES is expected to use HFC-227 or a similar chemical with 10% sodium bicarbonate powder as extinguishing agents. These materials will be handled only by EPA certified technicians. Any refrigerant or fire suppressant evacuated from the system will be reclaimed for reuse or disposed of IAW EPA regulations. While both R-134a and HFC-227 are fluorinated hydrocarbons, neither are per- or poly-fluorinated alkyl substances (PFAS) included in EPA's PFAS Master List.

All hazardous materials and wastes will be managed according to federal, state, and local environmental regulations. Compliance with these regulations will be the responsibility of the facility using the hazardous materials or generating the hazardous waste. These materials will be comparable to those required for other military vehicles and would not require unique stocking, handling, storage, or disposal requirements. Therefore, existing protocols for proper transport, handling, application, and disposal of hazardous materials and wastes will be used. Hazardous materials and wastes will be stored in controlled areas with appropriate containment to prevent their release to the environment. Should release of a hazardous substance occur, personnel would respond according to the sites' existing ISCP and SPCCP protocols.

Hazardous materials and wastes related to MPF production and maintenance will not present extraordinary use, storage, or quantities and will not require special materials or infrastructures as

compared to current vehicles within the Army inventory. Therefore, use of the MPF is not anticipated to generate new hazardous waste streams.

Testing, Training & Operations

Hazardous materials used/generated during operation, including during testing and training, are generally limited to fuel, vehicle fluids, lubricants, and munitions. Environmental impacts resulting from these products would be expected to be minimal.

The vehicle will require routine refueling. In addition, vehicle fluids, although changed out during maintenance activities, may periodically need to be topped off. Grease or other lubricants may be applied on an as needed basis. Technical manuals will outline procedures to minimize the likelihood of a spill during refueling and topping off fluids. In the event of a spill, personnel would follow SPCCPs, ISCPs, and other SOPs that address clean-up and disposal.

Munitions, which contain hazardous components, are required for effective crew training. Soldiers receive training on safe handling of munitions. Spent casings will be disposed in accordance with installation procedures and environmental laws and regulations.

Demilitarization and Disposal

Some hazardous wastes will also be generated during D&D of the MPF. Hazardous waste may be generated through the collection and disposal of POLs, batteries and electronics; use of cleaning agents; use of chemical and/or abrasive stripping processes; and torch cutting or similar metal cutting techniques. These processes will be performed in controlled areas equipped for collection, containment, storage and disposal of generated wastes. As part of D&D, parts of the MPF may be reused, recycled or sold when legally authorized, which will reduce hazardous wastes.

D&D functions will be performed at qualified Government or Government contracted facilities and managed by DLA Disposition Services. All wastes will be properly characterized as hazardous or non-hazardous per federal, state, and local standards and regulations. The facilities that receive recyclable materials, non-hazardous waste or hazardous waste must meet all federal, state, and local laws and regulation for the type of materials or wastes that their facility accepts.

Figure 4 suggests those probable hazardous materials associated with the MPF that will require reuse, recycle or disposal.

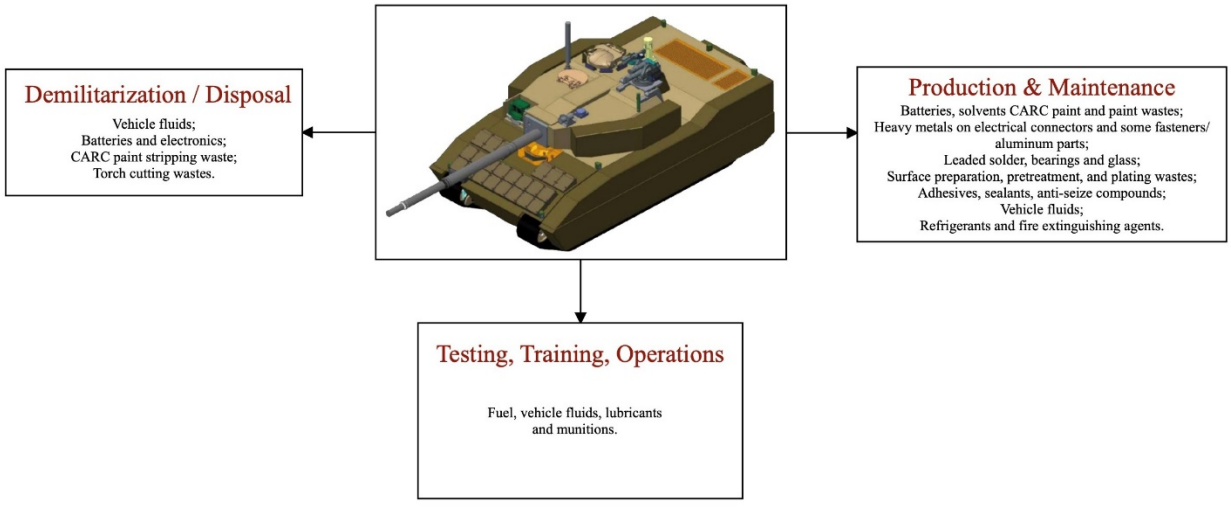


Figure 4: Probable HAZMATs Associated with the MPF

6.5.2.2 No-Action Alternative

Implementing the No-Action Alternative would result in minimal impacts to hazardous materials and waste. Production facilities would likely continue to produce other similar goods using similar hazardous materials. Testing, training, operation and maintenance would be conducted with other similar military assets which use similar hazardous materials. D&D would continue with other similar vehicles, generating similar waste streams. As a result, the hazardous waste impacts expected from the No-Action Alternative are like those expected for the Preferred Alternative.

6.6 Noise

Noise is often defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, diminishes the quality of the environment, or is otherwise annoying. Human response to noise varies by the type and characteristics of the noise source, distance from the source, receptor sensitivity, and time of day. Noise can be intermittent or continuous, steady or impulsive, and it may be generated by stationary or mobile sources.

The Army's primary strategy for protecting communities and installation mission from adverse impacts caused by noise incompatibility is long range land use planning. The Environmental Noise Program is the primary mechanism for implementing Department of Defense Instruction (DoDI) 4715.13 DoD Noise Program at the installation level. The Environmental Noise Program promotes compatibility between the activities and operations within the installation, and between the activities and operations of the installation and neighboring civilian communities.

6.6.1 Existing Conditions

The affected environment is the area immediately surrounding facilities where production, testing, training, initial fielding, operation, maintenance and D&D will occur. Noise emissions on or around the MPF due to its production, training, operation, maintenance and disposal are typical of tracked military vehicles. These noise impacts can be mitigated with abatement controls and PPE for workers and operational crew. Noise emissions that upset ambient levels beyond the industrial or operational complex are of greater concern due to their potential interaction with neighboring sensitive receptors. Specific to MPF, industrial emissions are unlikely to alter ambient noise in surrounding areas. However, cyclic training and mission activities may exhibit intermittent and impulsive noise due to course maneuvers and firing weapon systems that may alter noise organic to surrounding areas.

6.6.2 Environmental Consequences

This section provides a discussion of the possible noise impacts resulting from implementation of the Proposed Action and No-Action alternatives. A significant impact occurs if noise emissions are loud enough to threaten or harm human health or result in violation of applicable federal, state, or local noise ordinance.

6.6.2.1 Proposed Action

The proposed action is described in detail in Section 4. Evaluation of noise generated by the proposed action is discussed below and organized by program phases. Phases with similar impacts are grouped to avoid repetition.

Production, Maintenance, and D&D

Fabrication and production activities associated with the MPF shall not present noise beyond that expected for fabricating similar military vehicles or large commercial equipment. Cutting, grinding, welding, bending, metal stamping, fastening, sanding, and painting are routine functions for the manufacturing sites and would occur whether or not the MPF was being produced. Other noise generating activities expected during MPF fabrication typical of industrial facilities includes deliveries via tractor trailer, unloading with fork trucks, and operation of the vehicle's engine, drivetrain, and hydraulic systems. Similar noise will result from maintenance and D&D activities which will be performed at existing industrial areas. Noise levels above the 85 decibel (dB) time weighted average are to be expected and will be mitigated with the proper PPE according to site safety and Occupational Safety and Health Administration (OSHA) regulations. Nuisance noise beyond site zoning laws and permitting is not expected and should not have any impact on neighboring communities. Noise emissions associated with production, maintenance, and D&D are expected to be minimal.

Testing, Training, Initial Fielding, & Operations

Noise associated with MPF testing, training, initial fielding and operations would be similar to currently fielded tracked large-caliber weapons systems. Vehicle operation will generate track and weapons noise that may adversely affect nearby wildlife and cause human health risks. Since site characteristics vary, each training, testing and receiving installation facility will complete their own site-specific NEPA noise analysis, as necessary. Based on intermittent operation at designated ranges and maneuver areas, the overall noise impacts are expected to be minimal.

Noise during MPF operation would be dominated by rolling noise typical of tracked vehicles, but the diesel power train and hydraulic pumps would also contribute to noise emissions. Based on similar vehicles, operational noise is expected to range from approximately 90dB at idle to 120dB at full operational velocity. For operators and crew, hearing protection will likely be required when inside or near an active MPF. However, vehicle operation noise is not expected to lead to nuisance noise for neighboring communities. MPF operation and live fire training will be conducted at established installations in areas designated for maneuver or other types of vehicle operation. Vehicle operation will be intermittent and is not anticipated to result in sustained noise emissions. Furthermore, training areas at installations are generally sited away from sensitive human receptors.

Live fire exercises will generate impulse noise. The MPF's main cannon is expected to generate Sound Pressure Levels (SPLs) up to 180dB at ignition with an equal SPL at impact downrange. The smaller-caliber coaxial weapons are expected to generate SPLs up to 165dB. Live fire exercises will be intermittent. However, they may disrupt wildlife and be heard in neighboring communities when they are occurring. If MPF live-fire activities are determined to significantly increase noise in neighboring communities, mitigation measures will be implemented to relieve the nuisance noise.

Indirect noise impacts would be expected due to construction undertaken by receiving installations to provide sufficient infrastructure to support the MPF. In general, construction is not anticipated at all fielding locations and is expected to be relatively short in duration. Site-specific NEPA analyses will be conducted, when necessary, to evaluate the impacts of short-term construction noise at each installation.

Some indirect noise impacts would also be expected from support vehicle operation. However, support vehicle noise impacts are expected to be minimal.

Overall, MPF testing, training, initial fielding, and operation are not expected to significantly alter or disturb baseline ambient noise levels on a constant basis for neighboring areas, ecosystems and habitats. Consequently, its noise impacts are considered minimal.

6.6.2.2 No-Action Alternative

Implementing the No-Action Alternative would result in minimal noise impacts. Production, testing, training, operations, maintenance, and D&D will continue with other vehicles. While sound signatures may vary slightly with other vehicles, differences would be minimal. Under the No-Action alternative, additional support infrastructures would not need to be constructed. Consequently, indirect impacts due to construction noise would be avoided, as well as indirect impacts due to operation of MPF support equipment and vehicles. In summary, noise impacts expected from the No-Action Alternative are similar, but slightly less, than those expected for the Preferred Alternative.

6.7 Biological Resources

Biological resources are a component of every ecosystem and refer to the living landscape to include plants, animals, insects, and microorganisms. Together, biological resources and their habitat form a complex set of relationships in an ecosystem. The structure and function of an ecosystem is largely determined by energy, moisture, nutrient, and disturbance regimes, which in turn are influenced by a variety of biological and non-biological factors such as climate, geology, flora, fire, hydrology, and wind (US Fish and Wildlife Service, 2012). Although this resource area includes all biological resources, it highlights native plants (flora) and animals/insects (fauna).

6.7.1 Existing Conditions

The affected environment includes the ecosystems where production, testing, training, initial fielding, operation, maintenance and D&D are located. Existing biological resources at production facilities and on Army installations vary based on location and site setting. Eco-regions denote areas of general similarity in ecosystems in the type, quality, and quantity of environmental resources. As illustrated in Figure 5, the specific biological resources across the country are located in a variety of eco-regions. Consequently, existing conditions at MPF production, initial fielding, operation, maintenance and disposal sites are expected to vary.

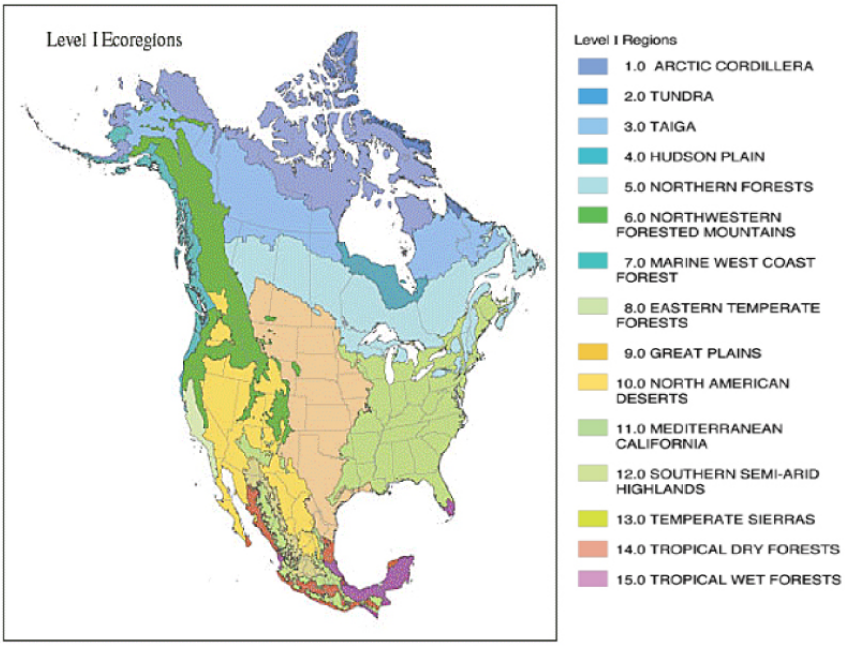


Figure 5: North American Level 1 Eco-regions (EPA, 2015)

6.7.2 Environmental Consequences

This section provides a discussion of the possible impacts on biological resources resulting from implementation of the Proposed Action and No-Action alternatives. A significant biological impact would include substantial, permanent conversion or net loss of habitat; or would result in long-term loss or impairment of a substantial portion of local habitat (species-dependent); and/or result in the unpermitted "take" of threatened and endangered species.

6.7.2.1 Proposed Action

The proposed action is described in detail in Section 4. Evaluation of impacts to biological resources generated by the proposed action is discussed below and organized by program phases. This section includes analysis for prototype production, since this is a specific activity for which PM MPF is the proponent and location information is known. It also includes more general evaluation for vehicle production, which may be further evaluated in the future, and for activities which will occur on Army installations. Phases with similar impacts are grouped to avoid repetition.

Production

MPF production is expected to have insignificant impacts on biological resources. MPF prototype fabrication, described in Section 4.3, will be completed in six Michigan cities and one Ohio city. While threatened and endangered plants and animals are present in the counties these cities are located in, they do not contain any critical habitat (APPENDIX D: Endangered/Threatened Species Inhabiting Potential Manufacturing Site Counties). Prototype manufacturing is planned at existing factories and fabrication shops and construction of new facilities is not expected. Full-scale production is also expected to occur at existing facilities but may require expansion or upgrades. If new facilities are required, they are expected to be built in industrial areas and not on pristine land. Local regulations and permitting procedures will provide controls for potential impacts

during production facility construction. In addition, the production contractors are required to adhere to federal, state and local environmental laws and regulations. As a result, manufacturing is not expected to degrade the natural environment or result in habitat loss for threatened and endangered species, common plants and animals; or result in exceptional impacts either directly or indirectly that damage biological resources or the habitats they depend on.

Testing, Initial Fielding, and D&D

Impacts to biological resources from testing, initial fielding and D&D are expected to be negligible.

Most test events will occur at established test sites on existing military installations which are currently used for similar activities for other Army ground systems. The sites have existing natural resource management programs, which include a site-specific Integrated Natural Resources Management Plan (INRMP) and ITAM Program.

Initial fielding, including vehicle transportation to receiving installations and de-processing in preparation to transfer control of the MPFs to units, is expected to have negligible impacts on biological resources. Transportation will occur along established land or sea transport routes. The total number of vehicles to be transported (approximately 500) is relatively small and unlikely to significantly perturb habitat for biological resources. De-processing would occur at existing installations in maintenance areas and is not expected to disturb habitat.

D&D would be conducted at existing facilities used for similar activities. Facility management plans govern reception, storage, processing and shipment with consideration given to minimize the release of pollutants to ERAs that may impact biological resources.

Training, Operation & Maintenance

Impacts to biological resources from training, operation and maintenance are expected to be minimal. Existing training infrastructure will be sufficient for MPF at some installations. At others, range upgrades/modifications may be required. The likelihood of biological disturbances is higher in these cases. However, the Army has a robust Sustainable Range Program and Army Environmental Program which work in concert to protect natural resources, including biological resources, to the extent practicable. Range upgrades would be completed in ways that minimize impact on Threatened/Endangered Species (TES) resources and minimize introduction of invasive or pest species consistent with site INRMPs. When upgrades are required, installations will evaluate impacts on biological resources in site-specific NEPA documentation.

Once training infrastructure is complete, operational exercises will be confined to the designated controlled areas. Site personnel will be responsible for ensuring the MPF does not operate in protected habitat areas that support TES resources. Exercises will be intermittent, limited to specific routes, and consistent with INRMPs and other site management plans. Consequently, they are not expected to significantly impact biological resources.

Fielding the MPF to sites not currently hosting tracked vehicles may necessitate construction of maintenance facilities and other infrastructure such as hardened bridges to facilitate general vehicle operation, operation of heavy support equipment and vehicles, and storage at the home station. In these cases, construction will be evaluated in site-specific NEPA documents. Maintenance facilities would likely be sited within cantonment areas, limiting damage to natural ecosystems. Development will be consistent with comparable commercial construction and will be managed according to environmental management plans and construction permits. Adherence

to plans and permits should minimize fugitive air emissions or sediment-heavy runoff which may impact habitats adjacent to construction sites. Impacts from construction may be mitigated by replacing lost habitat with constructed natural areas such as man-made surface water reservoirs and native plantings.

Sustainment maintenance will be conducted at existing facilities used for vehicle maintenance and overhaul. Depots and contractor facilities are required to follow environmental regulations and have plans which serve to minimize pollutant release during materials receipt, storage, processing and shipment that may impact biological resources.

6.7.2.2 No-Action Alternative

Implementing the No-Action Alternative would result in no impact to biological resources. Production, testing, training, operations, maintenance, and D&D would be expected to continue with other vehicles at established locations/facilities properly permitted for the activities. Construction of ranges and support infrastructure would not be required, avoiding the associated disturbances to biological systems.

6.8 Cultural and Historical Resources

Cultural resources is a broad term addressing all aspects of human activities, including material remains of the past and the beliefs, traditions, rituals, and cultures of the present. Specifically, cultural resources include Native American archaeological sites, historic archaeological sites, historic buildings, and elements of the natural landscape which have traditional cultural significance. This includes those resources listed in the National Register of Historical Places (NRHP). The register, authorized under the National Historic Preservation Act of 1966, identifies cultural resources worthy of preservation within the United States.

6.8.1 Existing Conditions

Existing cultural resources at production facilities and on Army installations vary by site. Installation location and size heavily influences the extent and scope of the historic properties, cultural items, archaeological resources, sacred sites, culturally-sensitive sites, and cemeteries present on an installation. Each Army installation maintains an Integrated Cultural Resources Management Plan (ICRMP). The ICRMP is a site-specific plan for managing and protecting cultural resources present at that installation.

6.8.2 Environmental Consequences

This section provides a discussion of the possible impacts on cultural and historic resources resulting from implementation of the Proposed Action and No-Action alternatives. A significant Cultural and Historical Resource impact would include concerns raised by Indian Tribes regarding potential impacts to properties of religious and cultural significance; impact to historic archaeological sites; or direct/indirect alteration of the characteristics that qualify a property for inclusion in the NRHP without appropriate mitigation.

6.8.2.1 Proposed Action

The proposed action is described in detail in Section 4. Evaluation of impacts to cultural and historical resources generated by the proposed action is discussed below and organized by program phases. Phases with similar impacts are grouped to avoid repetition.

Production

Production of the MPF is expected to have negligible impact on cultural and historic resources. The locations for MPF prototype fabrication, as noted in Section 4.3, are BAE and GDLS facilities in Sterling Heights, Michigan, Loc Performance facilities in Plymouth, Lapeer, and Lansing, Michigan, Merrill Manufacturing in Merrill and Alma, Michigan, and JSMC in Lima, Ohio. The MPF production location is undecided as a production contractor has not yet been selected.

Of the prototype fabrication facilities, none are listed on the NRHP. These facilities are industrial facilities where the contractor is responsible for operating in compliance with all applicable permits. Consequently, it is not expected that facility operations will directly or indirectly affect any other sites in the area which may be of cultural or historical importance.

Although the MPF production contractor has not yet been selected, it is assumed that MPF production will be executed in existing facilities currently used for similar activities, with possible upgrades required. If new facilities are required, they are expected to be sited on existing industrial land. Local permitting procedures and regulations will provide controls for potential impacts during production facility construction. As with prototype production, the manufacturers are responsible for compliance and obtaining any permits required by federal, state and local governments to conduct industrial activities. Industrial activities such as these are not expected to be completed at facilities listed on the NRHP. Negligible impacts on cultural or historical resources are anticipated.

Testing, Training, Initial Fielding, Operations, and Maintenance

Testing, training, initial fielding, operating and maintaining the MPF is expected to have negligible impact on cultural or historical resources. MPF operation will occur at existing Government facilities in areas designated for these activities. MPF operators and maintainers will follow ICRMPs and other site cultural resource management programs. Testing will not require new construction. However, the proposed action may require infrastructure construction at some installations to support system training, maintenance, and storage. This may include maneuver areas, tank trails, hard stand, and maintenance facilities. The likelihood of disturbing cultural resources is higher at these locations. In these cases, site-specific cultural resource impacts of required construction will be evaluated in site-specific NEPA documentation. Construction will be completed in accordance with the ICRMPs to minimize potential impacts. By following existing management plans and procedures, negligible impact to cultural resources is anticipated due to MPF operations or maintenance.

Demilitarization and Disposal

D&D activities will be performed at established government and/or industrial facilities properly zoned to conduct the required activities where similar work already takes place. All designated D&D sites will comply with federal, state and local zoning laws and will not interact, damage, degrade or destroy Native American archaeological sites; historic sites or buildings, buildings listed in the National Register of Historic Places or landscapes of cultural significance.

6.8.2.2 No-Action Alternative

Implementing the No-Action Alternative would result in no impact to cultural or historical resources. Production, testing, training, operations, maintenance, and D&D would be expected to continue with other vehicles at established locations/facilities properly permitted for the activities.

No construction would occur, drastically lowering any potential to impact cultural or historical resources.

6.9 Public Health and Safety

The statutory purpose of NEPA includes promoting the "health and welfare of man" (42 U.S.C. § 4321 *et seq.*). Analysis of the impacts to which the Proposed Action affects public health and safety is woven throughout many sections in this LCEA. This section is included to further provide an understanding of the potential impacts the Proposed Action has on human health and safety.

6.9.1 Existing Conditions

The affected environment includes the people involved in the production, testing, training, initial fielding, operation, maintenance and D&D and the communities in which they are located. Conditions that affect public health and safety at production facilities and on Army installations vary by site but have some similarities. Production facilities employ adults engaged in industrial manufacturing. Army installations include adult populations that work in a wide range of occupations, including tactical support, managerial and administrative, education, health care, services, construction, facilities and equipment repair, and related occupations. The workplaces for commercial production facilities are subject to OSHA regulations and oversight. Government installations also follow OSHA regulations, as applicable, in addition to complying with Army health and safety-related regulations (e.g., AR 385-10). Most installations also include Family housing areas with child populations, as well as the facilities that support that population (e.g., child development centers, schools, youth services facilities).

6.9.2 Environmental Consequences

This section provides a discussion of the possible public health and safety impacts from implementation of the Proposed Action and No-Action alternatives. A significant impact to public health and safety would include exposure of the public to harmful levels of chemical constituents or physical conditions caused by the system.

6.9.2.1 Proposed Action

Public health and safety impacts of production, testing, training, initial fielding, operation, maintenance, and D&D of the MPF are expected to be minimal.

The MPF would be designed to eliminate or minimize any health impacts to the crew and the public to the extent possible. The MPF program follows MIL-STD-882E, "DoD Standard Practice for System Safety". MIL-STD-882E is a systems engineering process to identify ESOH hazards and manage the associated risks. Risk management includes the implementation of mitigations for ESOH risks that MPF operation may pose to the immediate environment and general public.

Testing, training, initial fielding, maintenance and operations will be performed at Army installations in designated areas which are physically separate from the public. Production and sustainment level maintenance will be completed at industrial facilities zoned and permitted by local authorities to conduct such operations. In peace time, exposure is limited to military community populations where the MPF has been fielded. The MPF is not expected to pose a significant hazard to the general public through laser emissions, engine emissions, electric and magnetic fields, radiation, radio frequency, or sound emissions. Health impacts on the general public are expected to be similar to other tracked vehicles.

All aspects of D&D functions that potentially impact human health and environment will be contained, managed and mitigated according to applicable federal, state and local law within the site performing the work. To the general public, there is no exceptional characteristic of the MPF that would present a potential or likely hazard during D&D; nor is there any exceptional quality or contamination – organic, chemical or biological – that would present a threat to the D&D site, bordering properties or surrounding communities.

6.9.2.2 No-Action Alternative

Implementing the No-Action Alternative would result in minimal impact to human health. MPF production, testing, training, initial fielding, operations, maintenance, and D&D would not occur but would continue with other similar vehicles. Human health and safety risks would be on par with those described in the previous section for the MPF.

6.10 Other ERAs

Others ERAs considered include solid waste and transportation. Impacts on these ERAs are negligible. As a result, detailed analyses are not presented in this LCEA.

7 Conclusion

The lifecycle environmental impacts associated with MPF are expected to be minimal and temporary. General lifecycle activities including training with, operating, and maintaining the MPF are minimal and similar to that of other tracked vehicles. Specific impacts associated with design, production, testing, initial fielding, maintenance instructions, and D&D are also minimal and are comparable to other ground-based weapon systems (tracked and wheeled).

Mitigation measures have been identified as part of this analysis for some anticipated impacts. In addition, careful adherence to federal, state, military and local environmental regulations; installation processes, including spill contingency plans, pollution prevention plans and engineered controls; and procedures for testing, training, operation, maintenance, and D&D should further minimize any potential environmental impacts.

The MPF will be a new vehicle in the IBCT. As a result, some installations will require infrastructure improvements which may include hardened roads and bridges, hard stand for vehicle storage, improved/new maintenance facilities, improved/new maneuver areas equipped with appropriate low water crossings and tank trails. At these installations, environmental impacts will be evaluated in site-specific NEPA documents. As previously stated, impacts from infrastructure improvements will vary according to specific site requirements and the site's environmental, geographic, and cultural setting.

For times of conflict or national emergency in which the MPF system may be deployed by executive order, the proposed action is not subject to E.O. 12114 and 32 CFR 651. Even in this case, without a catastrophic event, significant environmental impacts or hazards to public safety as a result of deploying the MPF are not anticipated.

Each individual hosting site will be responsible for determining if additional NEPA analyses are required according to specific use and activities.

Activities associated with the preferred action have been reviewed and the impact of each activity assigned a rating of *Negligible, Minimal* or *Significant* for each ERA. Table 5 summarizes these impacts. For the purposes of this analysis, the ratings are defined as follows.

- **Negligible** - an environmental impact could occur but will have no noticeable or detectable effect on the resource area.
- **Minimal** - an environmental impact could occur and is readily detectable but is clearly less than significant, is temporary, or is mitigated to reduce the adverse impacts to less than significant.
- **Significant** - an adverse environmental impact which, given the context and intensity, violates or exceeds regulatory or policy standards, would substantially alter the function or character of the resource area, or otherwise meets an identified threshold.

Based on the analysis in this LCEA, the potential impacts to the ERAs would be minimal and temporary. Therefore, MPF production, testing, training, initial fielding, operations, maintenance, and D&D would not have a significant impact on the environment. Consequently, an EIS is not required and a Finding of No Significant Impact (FoNSI) has been prepared, refer to APPENDIX E.

Table 5: Summary of Environmental Impacts

Environmental Resource Areas	Production	Testing	Training[1]	Initial Fielding	Operations	Maintenance[2]	D&D[3]
Air Quality							
Water Quality							
Land Use & Soil Resources							
Socioeconomics							
HAZMATs/Wastes							
Noise							
Biological							
Cultural/Historical							
Public Health & Safety							

Negligible Minimal Significant

1. The PM is the proponent for tester training, new equipment training, and institutional training. This category includes the specific effects of these types of training. This category also includes the general effects of mission-level training for which PM MPF is not the proponent. Note infrastructure improvements may be required at some installations to support MPF training.
2. The PM is the proponent for developing maintenance instructions. Field maintenance is completed by the unit and sustainment maintenance is completed by the appropriate depot or contractor facility.
3. The PM is the proponent for planning D&D activities. D&D is carried out by Defense Logistics Agency Disposition Services.

8 Stakeholders Consulted

1. Engineering Director
   PM MPF

2. Logistics Director
   PM MPF

3. NEPA Program
   U.S. Army Environmental Command

4. NEPA Coordinator
   Environmental Management Branch
   Directorate of Public Works
   Fort Bragg, NC

5. Chief, Environmental Division
   Directorate of Public Works
   Fort Campbell, KY

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10 List of Preparers

1. PM MPF Environmental Manager
   Combat Capabilities Development Command – Ground Vehicle Systems Center
   Materials, Environmental, Coatings & Corrosion Team
   Warren, Michigan

2. EnviroCROSS
   Chemical Engineering
   CCDC-GVSC Support
   Okeechobee, Florida

APPENDIX A Acronyms and Abbreviations

Acronym	Definition
AFES	Automatic Fire Extinguishing System
AMC	Army Materiel Command
AMPV	Armored Multi-Purpose Vehicle
AoA	Analysis of Alternatives
APG	Aberdeen Proving Grounds
AR	Army Regulation
ASTM	American Society for Testing and Materials
BAE Systems	Integration of British Aerospace and Marconi Electronic Systems
CAA	Clean Air Act
CARC	Chemical Agent Resistant Coating
CCDC-GVSC	Combat Capabilities Development Command – Ground Vehicle Systems Center
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CHPPM	Center for Health Promotion and Preventive Medicine
CID	Commercial Item Description
CO	Carbon Monoxide / County
CO_2	Carbon Dioxide
CONUS	Continental United States
Cr^{+6}	Hexavalent Chrome
Cu	Copper
CX	Categorical Exclusion
dB	Decibel
D&D	Demilitarization and Disposal
DF	Diesel Fuel
DLA	Defense Logistics Agency
DoA	Department of the Army
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoDM	Department of Defense Manual
DT	Developmental Test
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ERA	Environmental Resource Area
ERDC	Engineer Research and Development Center
ESOH	Environment, Safety and Occupational Health
E3	Electromagnetic Environmental Effects
FoNSI	Finding of No Significant Impact

Acronym	Definition
FRP	Full Rate Production
FSR	Field Service Representative
FY	Fiscal Year
GDLS	General Dynamics Land Systems
GHG	Green House Gas
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
HAZMAT	Hazardous Material
HC	Hydrocarbon
HCl	Hydrogen Chloride
HEMTT	Heavy Expanded Mobility Tactical Truck
HFC-227	Heptafluoropropane
IAW	In accordance with
IBCT	Infantry Brigade Combat Team
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrate Natural Resources Management Plan
IOT&E	Initial Operational Test and Evaluation
ISCP	Installation Spill Containment Plan
ITAM	Integrated Training Area Management
JP-8	Jet Propellant 8
JSMC	Joint Systems Manufacturing Center
LCEA	Life Cycle Environmental Analysis
LRIP	Low Rate Initial Production
LUT	Limited User Test
MIL-DTL	Military Detail Specification
MIL-PRF	Military Performance Specification
MIL-STD	Military Standard
MPF	Mobile Protected Firepower
MS	Milestone
MTA	Middle Tier of Acquisition
NAAQS	National Ambient Air Quality Standards
NATO	North Atlantic Treaty Organization
NEPA	National Environmental Policy Act
NET	New Equipment Training
NG	National Guard
NH_3	Ammonia
NO_x	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OCONUS	Outside Continental United States
ODC	Ozone Depleting Chemical
ODS	Ozone Depleting Substance
OEM	Original Equipment Manufacture

Acronym	Definition
OPSEC	Operations Security
OSHA	Occupational Safety and Health Administration
OT	Operational Test
Pb	Lead
PbO_x	Lead Oxides
PD	Production and Deployment
PEO GCS	Program Executive Office Ground Combat Systems
PFAS	Poly-Fluorinated Alkyl Substance
PM	Project Manager
PMCS	Preventive Maintenance Checks and Services
PM_t	Particulate Matter
POL	Petroleum, Oil and Lubricants
PPE	Personal Protection Equipment
RAM	Reliability, Availability, and Maintainability
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
SAE	Society of Automotive Engineers
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SOP	Standard Operating Procedure
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SPL	Sound Pressure Level
SVA	Soldier Vehicle Assessment
TES	Threatened/Endangered Species
TM	Technical Manual
TRADOC	Training and Doctrine Command
UK	United Kingdom
US	United States
VOC	Volatile Organic Compound
VOHAP	Volatile Organic Hazardous Air Pollutant
WSMR	White Sands Missile Range
YPG	Yuma Proving Ground

APPENDIX B Soil Compaction

Due to the MPF's weight, soil compaction and porosity are a concern during training, staging and storage. Soil compaction is the reduction in volume of a given mass of soil and measured as a change in bulk density, void ratio or porosity. Soil properties such as hydraulic conductivity and liquid/vapor diffusion are affected by compaction. There are many factors that affect soil compaction but for a given weight of vehicle, the most influential factors are the pressure applied by the vehicle and the moisture content of the soil.

Porosity refers to the number of pores or pore space contained within soil. Pore space is the space between particles and determines the amount of water that a given volume of soil can hold. The porosity of a soil is expressed as a percentage of the total volume of soil material or the ratio of void volume to total volume. Total porosity typically ranges from 40-60% in healthy mineral soils.

Soil compaction occurs as pore space is reduced and soil particles are compressed. Heavily compacted soils have a higher density and lower total pore volume. This reduces the ability for water to flow through the soil, reducing the infiltration rate, drainage, and gas exchange. In addition, compacted soils require root systems to exert greater physical force to penetrate the compacted layer for necessary growth.

Bulk density is often used as a quantifiable measure of soil compaction. Bulk density is the weight of soil in a given volume. Bulk density increases as the pore volume decreases. Bulk density increases with compaction and tends to increase with depth. Sandy soils are more prone to high bulk density. Soils with a bulk density higher than 1.6 g/cm^3 tend to restrict root growth.

Changes to soil density resulting from a given input of compaction energy or weighted force are dependent on soil moisture content. For dry soils, increasing moisture content creates a lubricating effect which enables soil particles to move closer when subject to compaction and reduces air voids. As moisture content increases, soil compaction increases until the maximum dry density is reached. The moisture content at maximum dry density is called optimum moisture content (see Figure B-1). As water content continues to increase, the water prevents soil particles from moving into the pore space and dry density decreases.

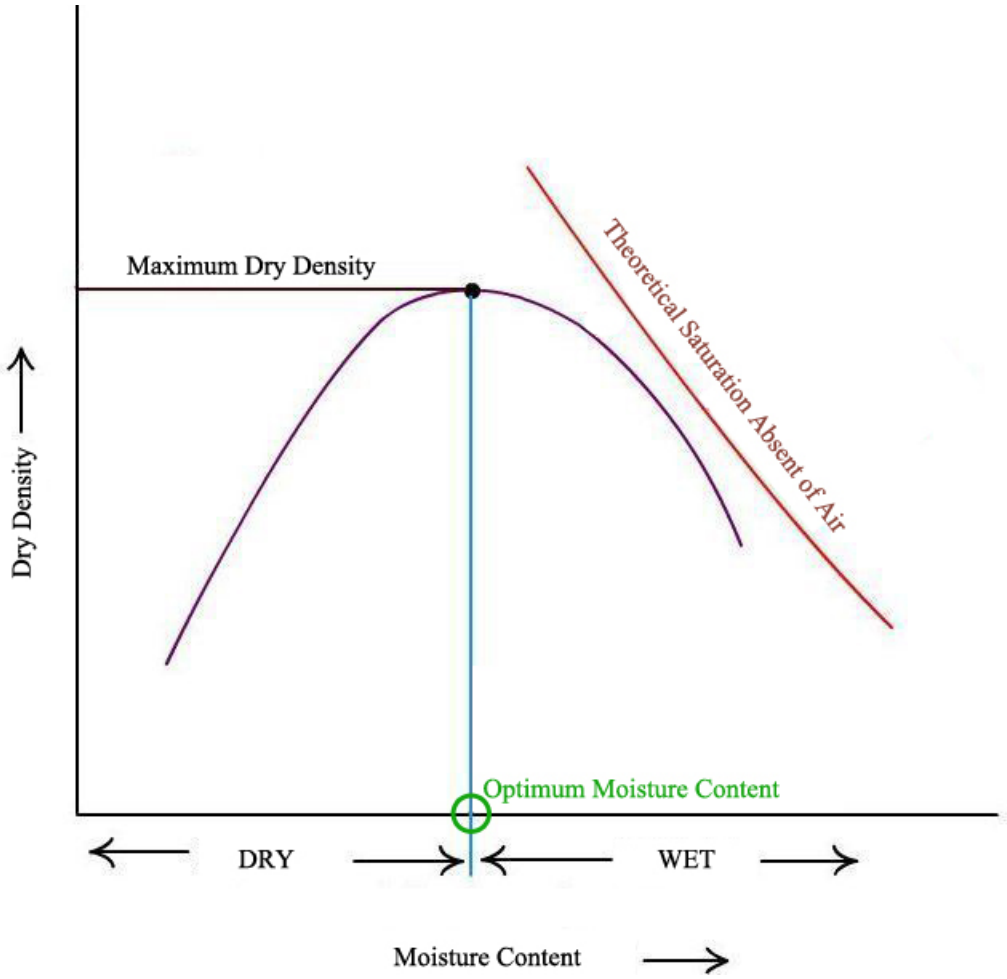


Figure B - 1: Soil Compaction Curve

As the applied pressure varies, the characteristic relationship between soil moisture content and soil density remain the same (see Figure B-2).

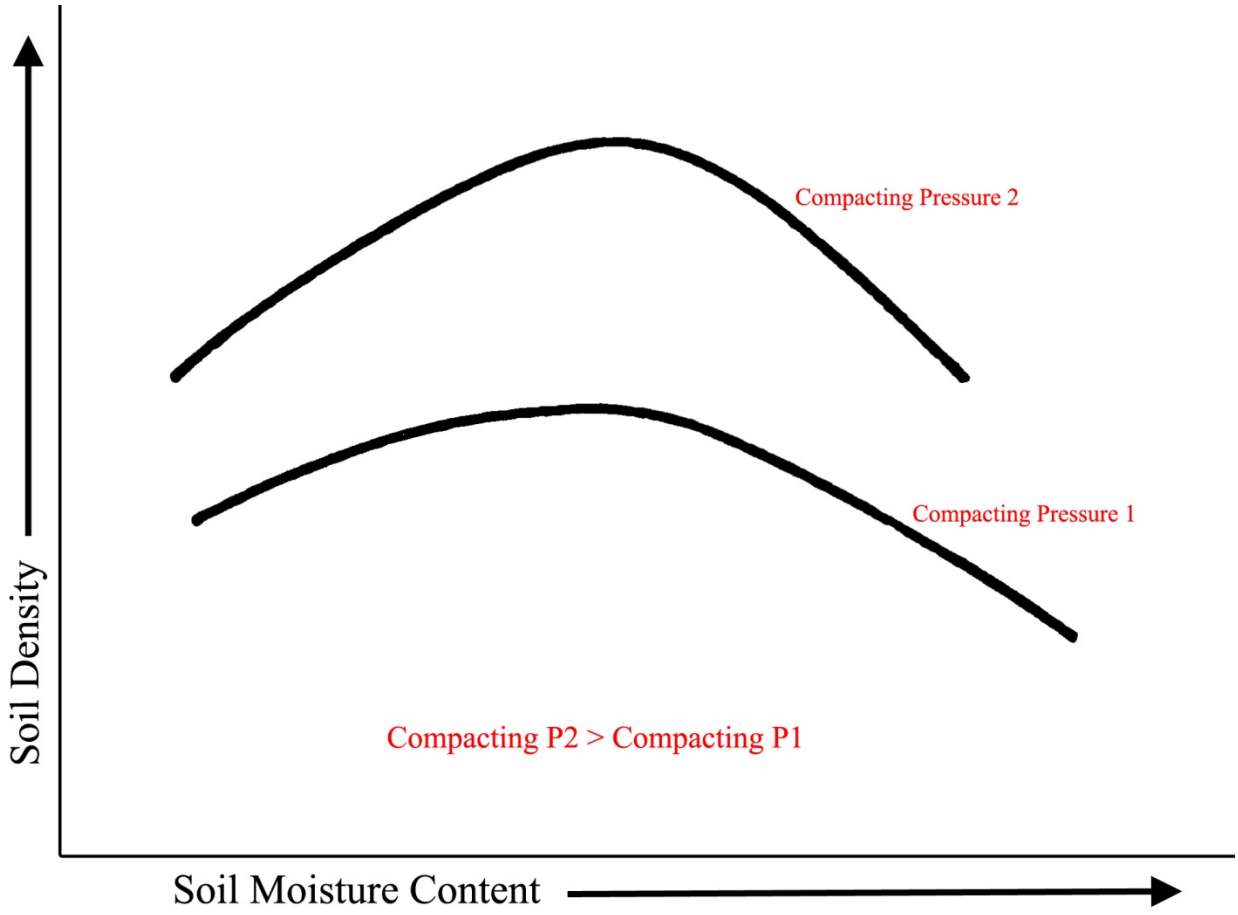
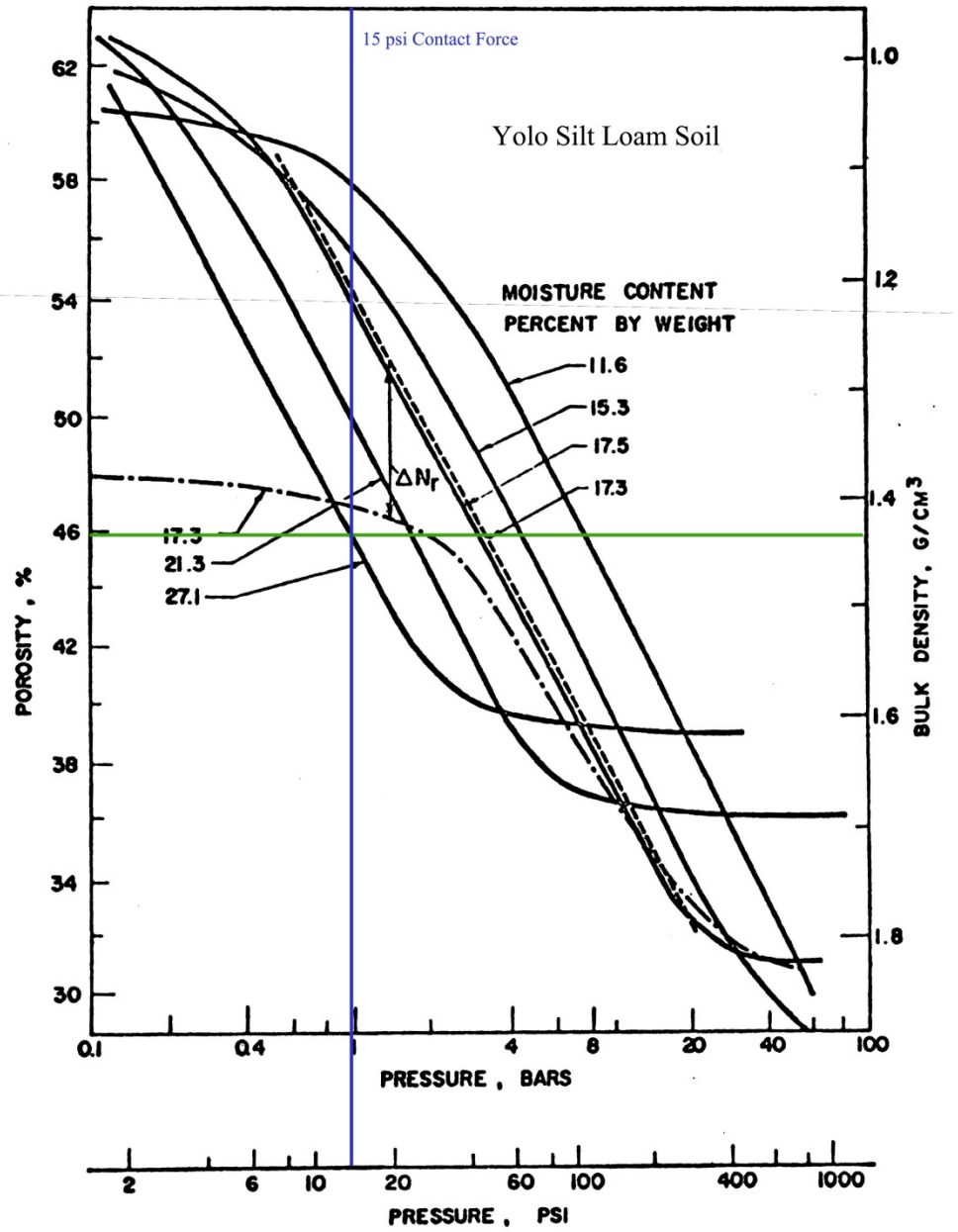


Figure B - 2: Relationship of Soil Density and Soil Moisture Content as a Function of Compacting Pressure

Studies have analyzed the impacts to soil density and porosity as a function of soil moisture content and applied compaction force. Quantitative impacts vary based on soil type, but the observed trends are generally the same. One such study by the Department of Agricultural Engineering, Macdonald Campus of McGill University, Quebec (Amir, I., G.S.V. Raghavan, E. McKyes, and R.S. Broughton. 1976. Soil compaction as a function of contact pressure and soil moisture. Can. Agric. Eng. 18: 54-57), examined porosity and bulk density effects on Yolo Silt Loam soil of various moisture contents and contact pressures. Yolo soil is moderately permeable and exhibits very slow surface run-off with a nominal erosion hazard. Natural fertility is high with an effective rooting depth of more than 60 inches. Yolo is used mainly to host almonds, walnuts, corn, sugar beets, tomatoes, alfalfa, and melons. Other uses include dry farmed barley, wildlife habitat and recreation. The McGill University study illustrates the probable impacts of a 35 ton tracked vehicle of approximately 15 psi ground pressure on a given soil type under varied moisture content. In Figure B-3, each solid curve represents a different moisture content of virgin, single pass soil ranging from 11.6 – 27.1%.



Data referenced and reproduced from Soil Compaction as a Function of Contact Pressure and Soil Moisture Content, Dept. of Agricultural Engineering, Macdonald Campus of McGill University, Ste. Anne de Bellevue, Quebec; Canadian Agricultural Engineering, Volume 18, No. 1, June 1976.

Figure B - 3: Relationship of Porosity and Compacting Pressure for Varied SMC for Pre-compacted and Virgin Soils

A vehicle such as the MPF transferring a contact force of 15 psi or approximately 1 bar will reduce the porosity of Yolo Silt Loam with a moisture content of 27.1% to near 46% porosity with a bulk density increase to 1.43 g/cm^3 in a single pass. These compaction results still remain within the

limits of healthy soils. As the soil moisture content is decreased, the effects of compaction at a given pressure are reduced.

Although the McGill University study is a review of agricultural applications and does not account for sheer forces applied by tank maneuvering, we can infer the order of compaction that might be realized from MPF use on similar soils. Site specific analysis will be required to account for local soil characteristics and how those characteristics respond to repetitive MPF drive-over. This study also illustrates that dryer soils can sustain higher axle loads and higher contact pressures with less adverse effects. Consequently, a practical method for mitigating soil compaction and deep rutting is to limit peace time training exercises to times when unpaved soil resources are at or near the optimum moisture content. This is particularly important because compaction remediation treatments do not provide complete soil recovery, especially after deep rutting has occurred.

APPENDIX C Probable MPF Hazardous Materials

The following is a summary of hazardous materials expected to be required for the production, sustainment and operation of the MPF.

- **Chemical Agent Resistant Coating (CARC)** – The contract requires use of CARC for prototype and LRIP vehicles IAW MIL-DTL-53072. Personnel shall not cut, grind, or chisel CARC or paint-coated materials as the airborne particulates of these materials are toxic. If these methods of removal are necessary, appropriate PPE and process controls, if applicable, are required. Spent thinners and stripping solvents may be deemed hazardous waste and must be disposed of in accordance with applicable environmental laws and regulations. For larger scale painting operations, process controls and operational protocols limit fugitive emissions outside of the process boundary for cleaning and coating application processes, promoting the controlled collection, containment, treatment, and proper disposal of the hazardous material. Also, chromate-free pretreatment systems are preferred and directed for use. Painting operations generate spent thinners, stripping solvents, waste paint, fiberglass paint filters, and used paint thinner. Any paint waste stream will be treated as hazardous waste in accordance with federal, state, and local laws and regulations.
- **Cadmium and Hexavalent Chromium Surface Finishes** – The MPF contract language prohibits use of cadmium or hexavalent chromium surface finishes. However, some legacy components and fasteners are expected to be allowed to be finished with these metals. Additionally, maintenance activities during sustainment may introduce cadmium and hexavalent chromium fasteners or components. Personnel should not cut, grind, or chisel these components, as airborne cadmium or hexavalent chromium particulates are toxic. Should these methods of removal be necessary, PPE and process controls are required. Maintainers will likely dispose of these parts as scrap metal, but handling and disposal should be completed IAW local installation procedures.
- **Electronics** – Although contract language prohibits use of cadmium and hexavalent chromium, the Government allows and expects use of these materials in electrical connectors mating with GFE connectors and in electrical connectors used in the AFES system. This prevents galvanic corrosion resulting from dissimilar metals in contact. While contract language generally prohibits use of lead, the Government allows use of leaded solder since alternative materials may impede electronics performance. Other hazardous materials may also exist in electronics, and likewise, will be disposed of or recycled IAW local installation procedures.
- **Petroleum, Oil and Lubricants (POL)** – The use of engine oils, lubrication oils, grease, coolants and fuel are required for operation of the MPF. Spent POLs designated as waste are typically non-hazardous and are either recycled (if such facilities exist at an installation) or disposed of as a non-regulated waste through the installations hazardous waste management facility. Military installations also have contingency plans such as Spill Prevention, Control, and Countermeasure Plans, Installation Spill Contingency Plans, and Standard Operating Procedures (SOPs) that address POL handling, storage, disposal, and clean up in case of an accidental spill. The MPF system fluids required to operate and sustain the MPF are discussed in Section 4.2, MPF System Description, Table 2.

- **Adhesives/Sealants** – Various adhesives and sealants used in the manufacture and maintenance of the MPF may contain solvents and heavy metals and may result in air emissions. Volatilization only occurs in the uncured state with zero emissions from adhesives and sealants once cured. Maintainers shall dispose of any waste adhesive IAW manufacturer and installation procedures. Technical Manuals (TMs) specifically prepared for maintaining the MPF will address the use, handling, necessary PPE and mandated disposal for adhesives and sealants to mitigate environmental impacts due to their use.
- **Solvents/Cleaners** – Cleaning with the use of solvents and/or aqueous cleaners will be required prior to surface pretreatment or application of organic finishing to system skins and assemblies. Maintenance will also require use of various cleaners/solvents for degreasing and refinishing. Some solvents/cleaners may contain volatile organic compounds (VOCs) and/or Hazardous Air Pollutants (HAPs). Selection of solvents/cleaners is regulated per military specification in order to minimize environmental impacts and protect the integrity of the substrate for which the solvent/cleaner is applied. Process controls are utilized where applicable and facility air permits are maintained to regulate VOC and HAPs emissions. Maintainers shall follow local installation procedures for handling and storage.
- **Fire Suppressants** – The MPF will be equipped with a crew-compartment Automatic Fire Extinguishing System (AFES), an engine compartment AFES, and two hand-held fire extinguishers. The fire suppressant used in the crew compartment AFES is expected to be heptafluoropropane (HFC-227) or a similar chemical which is non-toxic to the crew and approved by the U.S. Surgeon General for use in crew/passenger occupied confined spaces. HFC-227 is not an ozone depleting substance (ODS). The use of PPE during handling, maintenance and cleanup will be utilized to minimize exposure. AFES bottles will be replaced rather than refilled, minimizing the potential for unnecessary release to the environment.
- **Batteries** – The MPF will use lead-acid or lithium ion batteries to provide primary power for starting and operating. Installations must handle and dispose of batteries in an environmentally appropriate manner. When possible, used batteries are recycled.
- **Air Conditioning Refrigerant** – Tetrafluoroethane (R134a) is expected to be used as an air conditioner refrigerant due to its' nominal ozone depleting potential and low global warming potential. Use of PPE during handling, maintenance and cleanup is required to prevent exposure. Also, only trained and certified personnel may handle or refill refrigerants to further mitigate release of refrigerants into the environment.
- **Anti-seize Compounds** – The MPF will likely use anti-seize compounds to prevent galling, stripping, and seizing of fasteners and commonly contain silica, copper, zinc, and graphite. High temperature anti-seize compounds often contain heavy metals such as lead. Elemental components contained within anti-seize such as silica, copper, zinc, or graphite will remain encapsulated when cured, but airborne particles can be hazardous. The airborne dust from anti-seize compounds is also a potential explosion hazard. Any maintenance activity involving grinding, sanding, etc., should occur in areas with proper ventilation controls, and personnel will wear required PPE. Maintainers shall dispose of any waste anti-seize compounds IAW manufacturer and installations procedures.

APPENDIX D Endangered/Threatened Species Inhabiting Manufacturing Site Counties

ENDANGERED[(E)]/THREATENED[(T)] SPECIES	SAGINAW CO, MI	GRATIOT CO, MI	MACOMB CO, MI	LAPEER CO, MI	INGHAM CO, MI	WAYNE CO, MI	ALLEN CO, OH
Prototype Manufacturing Locations	Merill – Merill, MI	Merrill – Alma, MI	BAE – Sterling Heights, MI GDLS – Sterling Heights, MI	Loc – Lapeer, MI	Loc – Lansing, MI	Loc – Plymouth, MI	JSMC – Lima, OH
Mammals							
Indiana Bat[E] (Myotis Sodalis)	√	√	√	√	√	√	√
Northern Long-eared Bat[T] (Myotis Septentrionalis)	√	√	√	√	√	√	√
Birds							
Piping Plover[E] (Charadrius Melodus)			√			√	
Red Knot[T] (Calidris Canutus Rufa)	√		√			√	
Reptiles							
Eastern Massasauga[T] (Sistrurus Catenatus)	√	√	√	√	√	√	
Flowering Plants							
Eastern Prairie Fringed Orchid[T] (Platanthera Leucophaea)	√	√				√	
Existing Wetlands in County?	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Migratory Bird Species (#):	**21**	**19**	**23**	**16**	**21**	**27**	**14**
Critical Habitats?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Per U.S. Fish & Wildlife Service @ https://ecos.fws.gov/ipac/

APPENDIX E Finding of No Significant Impact (FoNSI)

Mobile Protected Firepower (MPF)

August 2021

Prepared for:

Project Manager (PM) Mobile Protected Firepower (MPF)

MPF Finding of No Significant Impact

August 2021

CONCURRENCE:

KRISTOFF.VIOLET.1230531125 Digitally signed by KRISTOFF.VIOLET.1230531125 Date: 2021.09.22 15:56:40 -04'00'

Chief, General Law Division

AMC Legal Center-Detroit Arsenal

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APPROVAL:

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Program Executive Officer, Ground Combat Systems

1.0 PROPOSED ACTION

Acquisition and life cycle of the Mobile Protected Firepower (MPF) system.

2.0 DISCUSSION

The purpose of the MPF system is to support infantry brigade combat teams (IBCTs) with protected, long range, precision direct-fire capability to neutralize enemy prepared positions, bunkers, and armor threats. The MPF will be a new type of system within the IBCT formation developed to fulfill capability gaps identified by the Army.

The Army has prepared a Life Cycle Environmental Assessment (LCEA) for the MPF program in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 U.S. Code Section 4321 *et seq.*) and Title 32 Code of Federal Regulations Part 651, Environmental Analysis of Army Actions. PM MPF is the proponent for acquisition of the MPF system, including design and testing, production, initial fielding, new equipment training (NET), development of maintenance instructions, and demilitarization and disposal (D&D). Once vehicles have been released to the units and NET has concluded, units will assume proponency for subsequent training, operation, and maintenance. Consequently, this LCEA is limited to a programmatic review of *specific* impacts related to production, testing, initial fielding, NET, development of maintenance instructions and D&D; and will *generally* consider potential impacts associated with fielding, operation, and maintenance. The MPF LCEA identifies, documents and evaluates the direct and indirect impacts for the proposed action. Additionally, the LCEA addresses the No-action alternative. The Environmental Resource Areas (ERAs) considered include air quality, water quality, soil resources, land use, socioeconomics, hazardous materials and wastes, noise, biological resources, cultural and historical resources, and public health and safety.

The environmental impacts related to MPF are typical of other ground-based tracked combat systems. It is expected that minimal impacts to air quality, water quality, soil resources and land use, hazardous materials and waste, noise, and public health and safety could potentially occur at locations where MPF lifecycle activities occur, including production, initial fielding, operation, maintenance and D&D. Impacts to socioeconomics and cultural and historical resources are expected to be negligible or nonexistent. Specific impacts associated with production, testing, initial fielding, NET, maintenance instructions, and D&D are expected to be minimal and comparable to those observed from other tracked combat vehicles. These impacts will be temporary. In addition, careful adherence to federal, state, military and local environmental regulations; installation processes, including spill contingency plans and pollution prevention plans; and standard procedures for testing, training, operation, maintenance, D&D should minimize any potential environmental impacts. Based upon this analysis, the proposed action would not have a significant impact upon the environment.

The MPF will be a new vehicle in the IBCT. As a result, some installations will require infrastructure improvements which may include hardened roads and bridges, hard stand for vehicle storage, improved/new maintenance facilities, and/or improved/new maneuver areas equipped with appropriate low water crossings and tank trails. Receiving organizations and installations are responsible for preparing any additional NEPA analyses required to address unique environmental concerns, including these infrastructure improvements, not assessed within this LCEA.

The LCEA will be made available to the public for review and comment. Comments must be received no later than 30 days from publication date of the Notice of Availability. To obtain

additional information regarding this decision or to request a copy of the MPF LCEA document, please contact:

US Army Combat Capabilities Development Command Ground Vehicle Systems Center,
Materials – Coatings, Corrosion & Environmental Team

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